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Corning Incorporated: The Growth and Strategy Council

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The Growth and Strategy Council provides a forum to challenge and be challenged which is essential in a company with very low attrition rates. It prevents us from becoming paralyzed by group think which can exist in a place where many of the people have a common history.

—John Igel, Director, FTTx Program

We are dealing with complex, difficult to measure portfolios. You have to have a leadership group which will invest time but also remain objective in order to make the hard decisions.

—Mark Newhouse, Director, New Business Development

It was early February 2008. Charlie Devins, the Chief Technology Officer (CTO) of a specialty chemicals and materials company, was interrupted mid-sentence as the 5:00pm whistle announcing the end of the work day at Corning Incorporated broke the mid-winter tranquility of the small town of Corning, New York, population 10,300.

The sounding of the whistle came at a timely point in the conversation Devins was having with Joe Miller, Corning's CTO. Miller had been explaining that while tradition and history were important at Corning, it did not signify that it was a company set in its ways. On the contrary: Corning was a company that had repeatedly reinvented itself to become one of the world's leading materials companies. It was not a history that the firm took lightly: in 2002 the worldwide telecommunications crash had cut Corning's revenues from $6.3 billion in 2001 to $3.1 billion the following year. The company's stock had collapsed, falling from a high of $100 in August 2000 to $1.50 in July 2002. The company had to take a $5.4 billion loss and lay off over 12,000 people. (**Exhibit 1** shows Corning's stock price over time.)

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By 2008, however, with 24,800 employees, 4,400 based in the town of Corning, the Corning Corporation was maintaining its global leadership position in glass for liquid crystal displays — a business with gross margins in the upper 60% range — while telecommunications sales had recovered and the company was at the leading edge in a number of other promising markets. The stock price had recovered, and in February 2008 was trading at $23, roughly its pre-bubble level. Meanwhile, roughly 70% of the people who left during the downturn in the early 2000s were back working at the company.

Devins, whose own company was struggling with how to manage its innovation strategy, had been urged to visit Corning to learn more about what he had been told was a best practice approach. As Miller explained it, innovation at Corning was centrally managed by a group called the Growth and Strategy Council. The council, which was headed by a triumverate including Corning's CEO Wendell Weeks, COO Peter Volanakis, and Miller, met once or twice a month to provide advice and guidance to the company's four business segments. Often important strategic decisions including the allocation of resources for various projects within a business segment were made during these meetings.

After hearing Miller describe the GSC and how it enabled innovation at Corning, Devins was at the same time impressed and skeptical. He wondered what made it work: Did such a structure fuel political tensions among the businesses? Wouldn't a centralized decision-making body slow the innovation process if not stifle it altogether? Then there was the question of scale. Could a centralized body like the GSC continue to work as well as it had in the coming years, when Corning hoped to double its rate of innovation from one to two businesses a decade to two to four, which were expected to deliver $1.5 billion in new revenue over a 10-year investment cycle at a cost of $1 billion? What would it take to keep making it work? And could this be replicated at another company or did Corning have something unique that made the GSC's success indigenous to Corning?

Corning's History of Innovation

Innovation was the core of Corning's identity and had been since the company was founded in 1851. As one senior executive stated, "While we are not a one business company, innovation is our only engine." Another suggested, "We're a science based company that sells innovations." And a third noted that Corning "is about taking inventions and turning them into products or processes." Corning's history reflected these sentiments. (See **Exhibit 2** for a timeline of Corning.)

In 1851, Corning's founder, Amory Houghton, first invested in glass-making in Somerville, Massachusetts and within 20 years the company, by then known as a producer of first-quality lead glass, made a major breakthrough in the production of signal glass for railroads. In 1880 the company received Thomas Edison's first order for light bulbs, and produced 3,684 that first year. While for the next 20 years, glass for railroad signals and electric light bulbs represented the majority of the company's sales, Corning was also active in producing a wide variety of specialty glassware,

including semaphore lenses, lantern globes, thermometer tubes for medical suppliers, and tubing for chemists and druggists.

By 1908, Corning had made a more formal commitment to its future by setting up a specialized research lab and hiring its first research scientist whose first innovation was "Nonex," a revolutionary type of thermo shock resistant glass. Nonex eventually led to the invention of Pyrex®. Pyrex, which was patented in 1912, was a runaway success, launching Corning into the consumer products business with a line of heat-resistant glass baking dishes.

In 1926 Corning began producing the revolutionary "ribbon machine," the centerpiece of a process to mass manufacture light bulbs – a process also invented and patented by Corning. At the same time Corning began research on refractory materials which led to the production of new materials such as ceramics that withstood high temperatures and which were used in applications such as the lining of furnaces. In 1929 Corning began to explore the casting of the giant mirrors used in modern telescopes, and in 1935 delivered the 200-inch mirror for Caltech's new Hale Telescope, which was then the biggest and most expensive scientific instrument ever built.

After initially abandoning research in glass fibers in the mid-1920s, Corning resurrected this field of research in the 1930s, and by 1938 the Owens-Corning Fiberglass Company was incorporated as a vehicle for exploiting the results of the work. Between 1939 and 1944 sales from the joint venture ballooned from $3.7 million to $56.2 million. The same year in which Owens Corning Fiberglass was founded, Corning succeeded in synthesizing the first of the silicone resins (sophisticated materials used as lubricants in a wide variety of settings), and in 1942, Dow Corning was formed to exploit those discoveries. By 1945, the year that the company made its first offering of common stock, Corning was producing 37,000 different items made from 450 different glasses, and accounted for 45% of the U.S. light bulb glass market.

During the 1940s and 1950s much of Corning's attention was focused on the budding television industry. While 1939 marked the first year Corning made sales to the TV industry, it was not until 1947 that the company opened a separate facility to make glass bulbs for TV cathode ray tubes. In 1949 the company made a major breakthrough in the development of centrifugal casting techniques, and sales exploded from 3 million units in 1949 to 7.5 million in 1950. Corning essentially became the sole volume provider of television bulbs. In 1954, Corning created a new niche for itself in the television industry developing the technology to make color TV bulbs, investing millions of dollars over the next few years in the new technology. While it took seven years for sales of color TVs to take off, once they did Corning was once again positioned to be the leading supplier. Sales went from 147,000 units in 1961 to 2.7 million in 1965.

At the same time that Corning was busy at work developing color TV bulbs, it was also making significant advances in heat resistant glass technology. In 1957, CorningWare®, a line of stovetop cookware was introduced and was a runaway success. Between 1959 and 1960, sales went from $15

million to $25 million, and Corning continued to invest in the area, announcing another major breakthrough, Corelle® dinnerware, in 1970. By 1965 the company's growing labs tested 200 different kinds of glass a week and had compiled files on nearly 125,000 discrete glass formulas. As one of the senior managers proudly told the press "R&D is our fastest growing activity."[1]

Corning's foray into developing fiber optics technology, namely in lasers and optical waveguides, came in the mid-1960s, long before anyone had any significant use for the technology. Corning had been approached by the British Post Office which was looking for a product that would increase bandwidth capacity. By 1970 the fiber optics research team had made significant progress, but the only potential U.S. customer, AT&T, claimed that "it would be thirty years before the American phone system would be ready for optical waveguides."[2] Instead of scrapping its investment in fiber optics, Corning formed a joint venture with Siemens in 1973 to develop optical fiber for cables. Within just three years, the first full scale pilot plant was built and field tests suggested that for the first time fiber optic waveguides might be competitive with copper. By late 1981 Corning had invested more than $100 million in optical waveguides.

Besides the extensive investments Corning was making in fiber optics technology, the 1970s saw the company venture into two new fields. In 1974, after four years of research in the development of ceramic substrates, Corning entered the automobile industry by selling $100 million worth of substrates for catalytic converters in auto exhaust systems. The 1970s also saw extensive investment in products designed for medical and diagnostic applications. Corning Medical went from $3 million in sales in 1970 to $30 million in 1974, and became a major focus for growth in the company. In 1981 Corning made the largest acquisition in its history buying MetPath for $125 million. In 1982, a joint venture with Genentech was announced and the last of the light bulb plants was sold.

In 1983 Jamie Houghton, one of a long line of Houghton's to run the company, became chairman and CEO. For the next 10 years the bulk of Corning's resources were focused on medical services and optical fiber. In the words of Peter Booth, corporate secretary and VP, corporate planning:

> The winners and losers didn't emerge for a while, so we rode two horses. But, the issue was always clear in our minds – were we going to be able to tease out a new life for the Company based upon Corning's traditional culture of science, invention and technology, or would Corning become the Medical Services business, which we all saw as far less tied to the traditional values of the company?[3]

By 1990 Telecommunications and Medical Services were the company's two largest segments, generating 26% and 24% of revenue and 31% and 27% of pretax operating income, respectively.

[1] Davis Dyer and Daniel Gross, *The Generations of Corning: The Life and Times of a Global Corporation* (Oxford University Press, June 2001).
[2] Ibid.
[3] Michael J. Roberts and Michael L. Tushman, "Corning 1983-1996: Transition at the Top," Harvard Business School Case # 401-034 (Harvard Business School Publishing, 2001).

However by the early 1990s the Medical Services business came under severe margin and regulatory pressure. In 1996 the Medical Services business was spun off as two firms: blood and clinical testing became Quest Diagnostics and pharmaceutical testing became Covance. The two companies together took 36% of Corning's revenue with them. The Consumer Products division — including CorningWare®, Corelle®, Pyrex® and Revere® — was sold in 1998. Corning realized a price of $975 million for a business with revenues of $630 million.

At the end of 1999 and into 2000 Corning was at the top of its game. The company's stock hit $105[4] in December of 1999, up from $28 in October of 1998, and analysts at Merrill Lynch predicted that the company's stock would double within the next three years.[5] Corning had approximately 40% of the worldwide market for optical fiber, and was one of the world's largest merchant manufacturers of optical modules and components. The worldwide fiber optic cable market seemed to be poised for growth, and analysts expected the photonics business to grow at almost 40% a year. Some estimates suggested that telecommunications, which accounted for 70% of sales, was taking as much as 68% of the company's R&D budget. In 2000 Corning completed more than eight significant acquisitions, spending more than $9.9 billion to deepen the company's expertise in photonics and related technologies. The 2000 Annual Report announced capacity expansion plans of more than $1.6 billion in optical fiber and $815 million in photonics. The company's market value had skyrocketed from $9 billion in 1996 to $50 billion by 2000. Corning was widely regarded as a runaway success.

Much of Corning's success at that time was attributed to CEO Roger Ackerman, who joined the company in 1962. As was written in a Business Week article in 2001:

> Roger Ackerman has accomplished what executives at such companies as AT&T, Kodak and Xerox haven't been able to: He has transformed a lagging giant of the Old Economy into one of the bright stars of the digital age. When Ackerman took over as CEO in 1996, Corning Incorporated was best known for its cookware. Now, as he steps down, it's the world leading supplier of optical fiber and other high-tech parts.

After taking over as CEO in 1996, Ackerman decided to make fundamental changes at Corning. As he explained, "We weren't winning with the hand we had."[6] In addition to selling off Corning's consumer business, he invested large sums of money in optical fiber, which Corning invented in 1970. Ackerman's belief in the company's intensified focus on optical fiber was tested in 1998, when the Asian financial crisis sent fiber prices plunging, and Corning's stock fell two-thirds. Instead of retreating, Ackerman stayed the course, even boosting R&D spending from $175 million in 1995 to $560 million in 2000.[7]

[4] Actuals at that time. Corning stock split 3 for 1 in October 2000, making pricing post-split at $35 and $12, respectively.

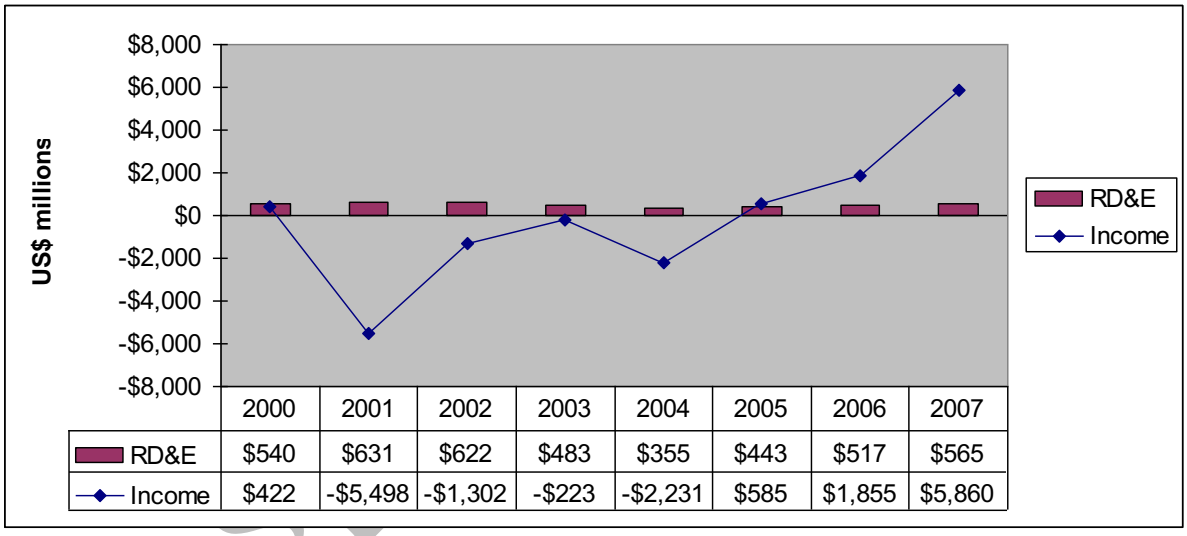
[5] Fox, Labowitzz and Astle, "Corning Inc," *Merrill Lynch*, December 1999.

[6] "Roger G. Ackerman and John W. Loose," *Business Week*, January 8, 2001

[7] Ibid.

Then, at the end of 2000 and into 2001, the bottom really fell out of the market. Fiber and photonic sales — and Corning's stock price — collapsed. Some observers wondered whether the company would survive. In April 2002, Corning's former CEO Jamie Houghton, who was then Chairman, was called back to lead the company. According to David Morse, Corning's head of research, on the day his return was announced, Houghton went to Sullivan Park where he reassured scientists that, "Corning is about research. I am counting on the R&D community to lead this company back to prosperity. We have done it over and over again throughout our history and we need to do it again." Wendell Weeks, who was named President and COO at the same time Houghton was called back, noted, "It's at times like this that many companies decide to fundamentally change who they are and what they do. We made a different choice. We embraced the core of our identity…our choice was not to change the fundamental nature of Corning, but rather to make Corning a better version of itself."[8] As **Figure 1** indicates, despite the dramatic drop in income in the early 2000s, Corning's R&D expenditure increased.

Figure 1 Corning Income vs. R&D Expenditure, 2000-2007



	2000	2001	2002	2003	2004	2005	2006	2007
RD&E	$540	$631	$622	$483	$355	$443	$517	$565
Income	$422	-$5,498	-$1,302	-$223	-$2,231	$585	$1,855	$5,860

Source: Corning Annual Reports.

While the telecom crash was painful on many levels, Corning learned many valuable lessons, particularly about how to think about and manage growth opportunities going forward. In addition, senior management recognized that the company needed to improve risk management and strategic balance.[9] As Peter Volanakis, the COO, explained, during the late 1990s, "We were not spending enough on growth. When our next big product happens, we need to invest more of the largesse into

[8] "Corning CEO: Innovation key to Corning's growth," *Fiber Optics Weekly Update*, May 4, 2007.

[9] "How Corning's Board Stays on Top of Technology," *Corporate Board Member*, March/April 2007.

other areas to balance the risk." "If we only invest in those businesses that are carrying the company, we are vulnerable," explained one executive. "We must reallocate to businesses that are hurting." As one manager admitted, "In many ways, the telecom crash helped us. All of a sudden we saw barriers breaking down between the divisions as we scrambled to save the best and brightest."

Corning in 2008

For analysts, Corning was a challenging company to follow due to the fact that it comprised several different businesses with unique and seemingly disparate technologies making the task of creating a neatly packaged definition for the company next to impossible. Corning's businesses were built around different glass technologies that served different markets and, therefore, had different business cycle times and trajectories. However, all of Corning's businesses were rooted in the same business model: invent a component that enables a complex system, protect it with IP, and develop world class manufacturing processes to make it.

Corning had four business segments:

Display Technologies Headquartered in Tokyo, the display business manufactured glass substrates for liquid crystal displays, also known as LCDs. Corning's foray into flat glass began in the 1960s when a scientist allowed a trough of liquid glass to overflow, eventually hardening into a piece of flawless glass. Corning tried to find a market for the new glass — for car windshields or for eyeglass lenses — but was unsuccessful. It wasn't until the 1980s when computer screen manufacturers started demanding high performance glass that Corning's "overflow glass" found a market.[10] By 2007, Corning's display business was several times the size of the nearest competitor and represented 41% of the company's revenue and 87% of net income. (See **Exhibit 3** and **4** for Corning financials.)

Telecommunications Corning's telecommunication business segment included optical fiber and the cable systems business, which also manufactured hardware and equipment components for the telecommunications industry. In 2007 the company wowed the telecommunications industry by introducing its "ultra-bendable fiber". Corning had been developing products for fiber-to-the-home (FTTx) since 1998. Known as "ClearCurve™," Corning's bendable fiber would enable fiber optic cables to be manipulated around tight corners without loosing signal strength. Such an invention would make the process of installing fiber optics in apartment buildings, which for a basement apartment typically required 12 right-angle turns, far less time consuming, expensive, and destructive.[11]

Environmental Technologies The environmental technologies segment manufactured ceramic substrates and filters for automobile and diesel emission control systems to help manufacturers meet stringent emissions standards for gasoline and diesel engines on light-duty and heavy-duty vehicles.

[10] Charles Fishman, "Creative Tension," *Fast Company*, October 2000.

[11] Stephanie N. Mehta, "Bend it like Corning," *Fortune*, July 25, 2007.

The substrates and filters delivered consistent, reliable and durable performance in filtering engine exhausts under demanding conditions while maintaining excellent pressure drop.

Life Sciences Life Sciences manufactured glass and plastic consumables for scientific applications. In 2006 the business launched a new product called Epic®, the world's first high-throughput label-free drug screening system. Epic® combined a lot of different disciplines throughout Corning including unique detection capabilities built into the photonic optical reader. Epic® used the glass used in LCDs and the same plastic used to make standard microplates.

Organizational Structure

Corning's organizational structure combined well defined business units — run by business general managers (GMs) who reported to the COO — and a large centralized research capability reporting to Joe Miller, the CTO. (See **Exhibit 5** for Organizational Structure.) GMs were responsible for new product development, manufacturing, sales and marketing, but all longer-term research was carried out at Sullivan Park, the company's large and soon-to-be-expanded R&D facility. One manager explained that Corning's centralized Sullivan Park research organization enabled businesses like LCD and optical fiber to leverage important synergies:

> The availability of bandwidth creates bigger demand for display. And better display creates bigger demand for bandwidth. It's a virtuous cycle. A better display creates pull for fiber-to-the-home technology. This is what a co-located R&D facility provides us. If all fiber R&D is sitting down in our fiber plant in North Carolina and our LCD guys are sitting in Asia or Corning and they never talk to each other, there will be some lost synergies. We have realized that intellectual property creation does not have to happen remotely.

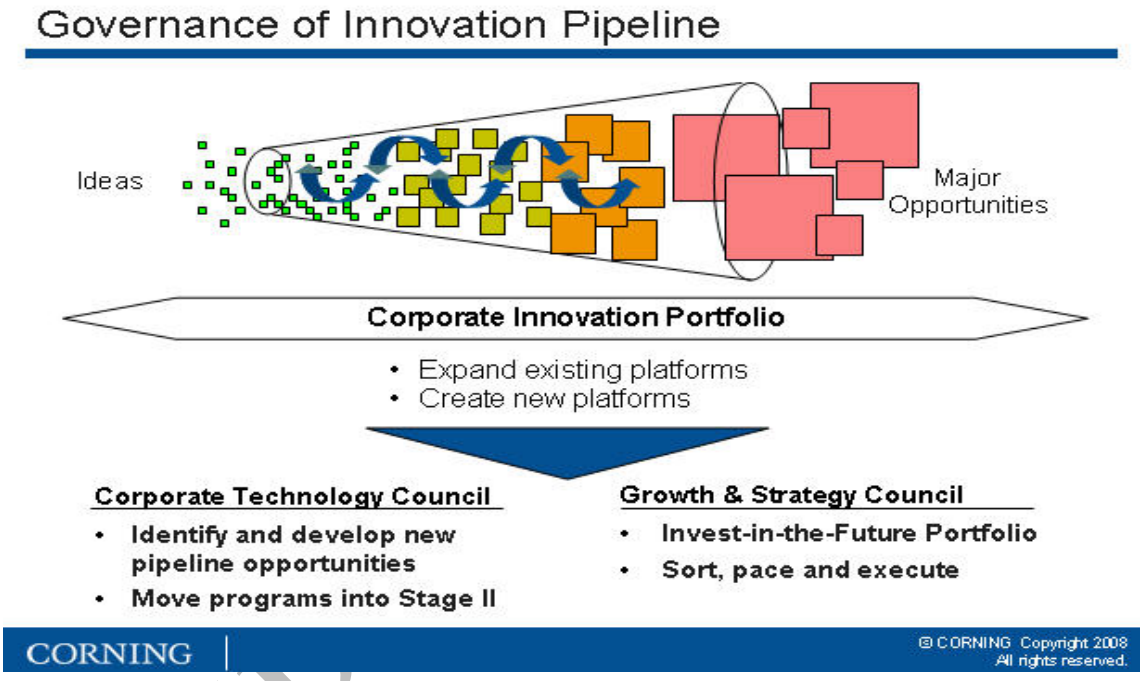
All businesses had a commercial technology manager who reported solid line to the GM, and a business technology manager, located at Sullivan Park, who reported solid line to the head of technology development and dotted line to the GM.

There was a fair amount of talent and knowledge sharing among the businesses and research groups, made easier by the fact that specialty glass and ceramic technology was a common denominator for nearly all of them and that R&D was a centralized function. As the VP of human resources noted:

> We know that we know glass and that we probably know glass better than anybody in the world and we're going to protect that capability as a company and we're going to look for opportunities to exploit those capabilities. Most of the businesses revolve around this theme and so we are able to move people across those different technology teams at Sullivan Park. So the display research director was formerly in the photonics business and the technology leader in the automotive business used to run technology for the fiber business. We do move people across divisions, early and often.

Several key committees made up Corning's governance model. (**Exhibit 6** breaks down each governing committee by member and lists key meetings throughout the year.) At the highest level was the Management Committee which was responsible for setting corporate strategy and running the company. The Operating Committee was responsible for overseeing businesses' current year performance to plan. Then there were the two councils responsible for overseeing the company's innovation projects and programs: Corning's Technology Council (CTC) and the Growth and Strategy Council. (**Figure 2**)

Figure 2 Governance of Innovation



The CTC, started in 2003 by Joe Miller, handled Stage 1 and 2 projects, focusing on early stage technologies and potential "keystone components" for both new and existing businesses.

Stage I → Gather information, build knowledge
Stage II → Determine feasibility
Stage III → Test practicality
Stage IV → Prove profitability
Stage V → Manage the lifecycle

The CTC, which included Miller, his direct reports, the Director of Strategic Planning, and Corning's Chief of Strategy, made decisions on whether early Stage 1 and 2 projects fit in with Corning, and over time, when and whether they were ready to graduate on to the GSC and whether they needed additional resources. Decisions on whether to move ahead on an early stage program largely depended on answers to a series of questions, discussed with the CTC, including:

1. Is the opportunity large?
2. Is it connected to a "megatrend"?
3. Is the problem significant – requiring a step change in cost or capability?
4. Is the hypothetical (quantified) value proposition compelling?
5. Is Corning's approach unique? Is there a possibility for significant differentiation?
6. Is there a good fit with Corning skills?
7. Are the required resources available?

As the company's innovation portfolio management team, the GSC focused on what were deemed "high-potential" Stage 2 projects and projects in Stage 3 and 4. Led by Corning's CEO, Wendell Weeks, COO, Peter Volanakis and CTO, Joe Miller, the GSC provided ongoing advice and support to businesses and their innovation programs. More than 10 days a year were allocated to GSC meetings that required Weeks, Volanakis and Miller be in attendance. As Weeks noted, "The GSC has a lot of control over a business's innovation and growth programs." No division manager had absolute control over his or her own growth portfolio

As one Corning executive pointed out, the collective knowledge and understanding attained by the CTC and GSC aided in the management of the overall innovation pipeline: "The CTC and GSC together prevent two common assumptions from occurring. One, GMs of businesses that are doing well can't assume that the company will continue to invest in all of their business opportunities. Second, GMs whose businesses are suffering can't just assume his/her focus is only on getting out of the hole in the short term." The councils provided an objective view in both cases, as well as considering balance and long-term profitability at the corporate level.

In 2005, a centralized new business development (NBD) function was created specifically to seek out and lead NBD with the objective of exploring new markets, new technologies, and potential new businesses outside of the strategic focus of current businesses. As one senior executive noted, "It is very hard to run a division from an operations perspective and oversee growth opportunities at the same time."

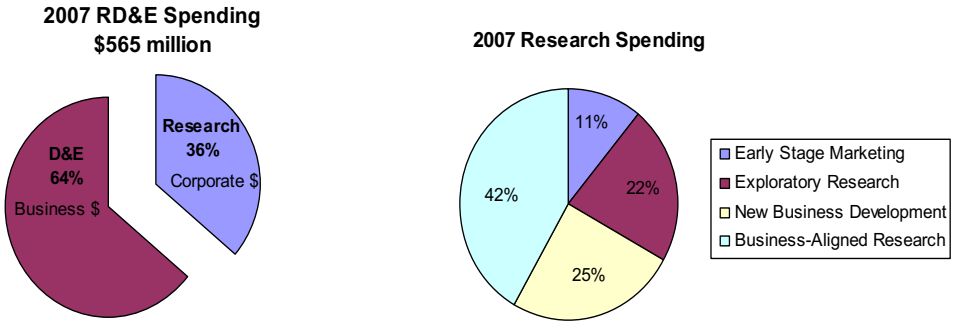
Corning spent 10% of revenue on RD&E, a considerably higher percentage than some of its competitors and far greater than the 3.4% spent in 1995 (**Exhibit 7**). The company boasted a highly productive R&D organization, and on measures like patents/$ spent, Corning outpaced such

technological giants as IBM, HP, Dow Corning, GE and DuPont.[12] Corning boasted single-digit turnover of 4% a year in the United States and less than 1% within its technical and research community. In a 2007 survey, the average turnover rate for technology and manufacturing was 10.6% and 10.2%, respectively.[13] As the head of Corning's Human Resources explained,

> We are able to keep turnover low because we put a lot of attention on employee affiliation, ensuring that employees feel connected to Corning as a company, our values and mission. When we recruit, we look for people who are looking for a long employment relationship. We're not looking for people to come for 3-5 years so they can fill up their resume. We want people to have a career with us.

Of Corning's $600 million RD&E budget, 64% was spent on development and engineering for existing businesses and was funded by the businesses based on their P&L. The remaining 36% of the RD&E budget supported research and was paid for at the corporate level (**Figure 3**). Of the investment in research, 50% went toward developing long range technology for current businesses (business-aligned research and early stage marketing) and 50% on the creation of new ideas and businesses (exploratory research and new business development), known colloquially as the "next wave." RD&E investments were not necessarily linked to a business's profitability. In 2006, display and environmental technologies recorded similar RD&E expenses despite the vast difference in the amount of income they generated.

Figure 3 RD&E Budget Breakdown



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Source: Internal Corning Documents.

Innovation as a Process and Philosophy

In practice, innovation at Corning followed what was called the "innovation recipe." It entailed acquiring a deep understanding of a specific technology alongside the identification of customers' difficult systems problems and solving those problems with a unique combination of materials and processes. The result was what Corning referred to as a keystone[14] component.

All innovation programs, which were headed by a program manager and included a commercial leader, a technology leader, and a manufacturing and engineering leader who reported to the program manager, used Corning's stage gate innovation process to advance through the stages of product and process development. Advancing to the next stage required meeting deliverables and advancing through the "Decision Diamond". Corning's innovation process had a series of detailed leadership questions for each of the four major focus areas: market, product, process and business case. Decisions on pacing and advancement of later stage programs also revolved around analysis and answers to these questions.

But for Corning, innovation was as much a set of principles as it was a process. For starters, innovation was about idea creation. As Corning's CTO Joe Miller put it,

> Ideas feed pipelines, and you need many more than you think which means reaching out globally and to multiple sources to get enough. I know many people think that dealing with large numbers of ideas is a distraction. In my experience, nothing creates realism around the potential of current programs more than a great bench of unstaffed potential programs and ideas. Nothing gives a bad idea more inertia than not having a good idea to replace it.

Innovation at Corning was also about being willing and able to take failed ideas and apply them elsewhere. As Weeks explained, "When an idea fails, we take that capability set and say, 'What else

[14] A keystone is the central wedge-shaped stone of an arch, without which the arch would collapse.

can we apply it to?' From failure comes knowledge. We aren't usually successful with the first thing we try."[15]

Finally, innovation at Corning meant being willing to make significant, sustained investments knowing that the payback would likely be well into the future. Internally this was known as "patient money." The concept of patient money could be seen in a number of Corning's key businesses. The display business lost money for 14 years before becoming profitable in 1999 and optical fiber took 20 years to become profitable despite the hundreds of millions of dollars the company invested during the 1960s and 1970s. In 2001, the company approved the appropriations request for a $250 million new factory for the diesel business at a time when the telecom business was crashing and the emission regulations for 2007 were not yet in place.

Corning's emphasis on innovation and its long-term outlook made the company unique. As one general manager explained,

> People who don't fit into the corporate culture tend to leave after 3 or 4 years. People who work for Corning work here because of the uniqueness of the company, the love of the technology no matter what business it's in, the feeling that you could be doing something that's important, and the heritage associated with the company. You find a lot of pride here.

Compensation was based 25% on personal performance, 25% on group performance and 50% on corporate performance.

In order for innovation to flourish at Corning, there needed to be a balance of resources between existing and developing businesses. Ensuring and safeguarding that balance was a key role of the Growth and Strategy Council.

The Growth and Strategy Council

The GSC began in 2001 as a meeting within Corning Technologies, which at the time was headed by Peter Volanakis and included all the businesses except telecom. Meetings were called as needed and brought together the relevant business leaders for discussion and analysis. As Jim Nagel, who ran the council in those early days recalled,

> This was at a time when telecom was growing like gangbusters and analysts were saying that we should spin everything off but telecom and become a pure play. Meanwhile, the display business at that time was a $300 million business and generating a lot more cash than telecom. So Pete's mandate for the growth council was to speed growth, get urgency across all the businesses, and to pace and regulate the resources. Pete was trying to instill a structure in the business by which good ideas could be incubated. His intent was to get experienced and seasoned leaders and use

[15] "How Corning's Board Stays on Top of Technology," *Corporate Board Member*, March/April 2007.

that as a way to guide the businesses in thinking about the right questions up front. It was more or less an informal dialogue.

One of Weeks's first big decisions after being named President and COO in 2002 was to take research spending decisions away from the divisions and centralize them under a corporate group – the Growth and Strategy Council. He hoped that by having a bird's-eye view of the whole company, senior management could direct money and resources to a division or to a project that, while currently unprofitable, could hold Corning's next big hit.[16]

Typically, programs with a product concept that proved they fulfilled a market need and had a significant potential annual revenue and a technology fit would get passed on to the GSC. These programs were typically moving toward the latter end of Stage 2 of the innovation process and required increased project investment.

GSC Role

The GSC's role as the company's innovation management council varied from making decisions about pacing and investment across the programs, to advising businesses on pricing strategies, to providing programs resource relief, to helping businesses decide whether two competing products could both succeed in the same market space, to determining whether a program made sense independent of a business to allow for greater synergies. The main objective of the council, however, was to maintain a balanced and robust innovation portfolio through pacing investments in individual programs and making resource allocations between Corning's existing and developing businesses. The collective experience on the GSC also provided expertise and judgment in helping programs flesh out and address the key issues and opportunities. As a former commercial technology manager for display explained, "The GSC is about establishing best practices and getting all innovation programs to the same level of rigor. The fact is if you have excellent programs that are all working together in their own little silos that doesn't mean the whole thing is going to work together."

Process

The GSC met several times a month. (**Exhibit 8** provides a look at the GSC's annual meeting calendar.) While attendance varied depending on the business and innovation program being discussed, there was a core group of members who were present at every meeting including Weeks (CEO), Volanakis (COO), Miller (CTO), the heads of research, development and engineering, and the head of HR. There could be as many as 18-20 people present at a given meeting.

The agenda for each GSC meeting was created by the Director of Strategic Planning months in advance. The number of topics per meeting varied but it was typical to have only three topics on an agenda with the GSC spending two to three hours on each. Ideally, meetings were scheduled to coincide with significant decisions about various programs and projects that had to be made. Certain

[16] Jonathan Fahey, "Glass Menagerie," *Forbes*, April 24, 2006.

businesses like diesel and display met with the GSC four to six times a year. Other businesses, like fiber optics, met less frequently.

There was no prescription or formal template that presenters were required to follow but as one former commercial technology manager noted, it was imperative that presenters do their homework before presenting in front of the GSC:

> The process works well when you engage some key stakeholders ahead of time. The Director of Strategic Planning is incredibly valuable in facilitating this. She finds out and communicates with the businesses, 'This is what people on the GSC are worrying about and this is what they want you to be thinking about.' So before you start putting together a pitch, you find out what are the burning questions. Failure to do such discovery work could produce disastrous results.

After making a presentation and engaging in Q&A with the GSC, presenters, who could include GMs, program managers and commercial technology managers, left the room to allow the core GSC members time to discuss what was presented and to make any immediate decisions that were necessary. In general, though, decisions were not made on the spot. After each meeting with the GSC, the Director of Strategic Planning provided written feedback to the presenters on how they did overall, the issues or concerns that were on the minds of the council's core members, and any decisions that may have been made.

While resources were often discussed at GSC meetings as part of the annual corporate budgeting process, the council devoted a meeting every September to review the technology portfolios of each of the businesses. As Volanakis explained, when it came to allocating research funds to the businesses, "The GSC practices zero based budgeting at the project level. We don't give everyone everything they ask for. This forces discipline, focus, high quality decisions in the business." As one senior manager explained,

> The portfolio meeting with the GSC in September is where the rubber hits the road when you say, 'This is what we want to do next year, these are the resources we have and these are the resources we need. It used to be that the amount of money you received was based on the growth rate of revenues. Spending on growth was restricted to about half of the growth in revenues. Now, it is less prescriptive and spending on growth is linked more to what you have to deliver. I can honestly say that I never got what I wanted, but I always got what I needed. We always managed to make do with what we were given.

An important part of the process entailed educating the GSC on the challenges of the business. As a VP of the diesel business explained,

> Unlike some of Corning's other businesses, ours is a risk-averse market in part because it's regulated and therefore there can be recalls. And recalls can cost our customers billions of dollars.

> And beyond that, we have a very different timeline than say the fiber optics business. While Corning ClearCurve™ technology went from the lab to market within one year or so, our timelines are more like five to seven years. We're constantly working towards the next set of regulations which at this time will be in 2010, 2011 and 2014. In this business, you invest for long-term market share leadership. It is not about investing for the next two-year contract. Further complicating our business, however, is the fact that like PCs, engine technology is constantly changing and improving. Being able to project those technologies five years in advance is a big challenge.

While the GSC was seen as a unique and effective way to manage innovation, there were some sources of frustration for innovation teams. A number of managers were frustrated by the number of attendees. As one manager explained, "One of my biggest complaints is that GSC meetings attract what feels to me like a peanut gallery. You have people representing certain functions and they always ask the same questions. The fact is there are only 4 or 5 people who really engage and make decisions." Another manager echoed this sentiment: "There are too many people in the room. For some people, it is intimidating to have to present in front of a group of 18-20 people. You start to worry about your presentation style. It becomes less about having a conversation which was the original intent."

Presenters were expected to have a well-organized and well-articulated message for the GSC, and the fact that the CEO, COO, and CTO were present, raised the bar on this expectation. However, David Morse, head of research at Corning and a core member of the GSC, painted a quite different picture: "GSC meetings are about extreme honesty. Nobody thinks what the political implications might be. No personal judgments are cast." Additionally, the GSC's expectation was to engage the presenter and team members in discussion. They did not want a performance, but rather an open dialogue on where progress and issues stood. A seasoned program manager said, "The Growth and Strategy Council provides a forum to challenge and be challenged."

The GSC in Action

The GSC had been instrumental in several critical 'wins' for the company of late, one of the biggest of which involved Corning's diesel business. In the late 1990s, Corning had been working on a specialized filter for diesel passenger cars for the European market. In 2005, Volkswagen, a longtime customer of Corning, approached the company asking if such a filter could be produced immediately, even though it was still in the testing stage. Volkswagen's urgency was driven by the fact that its rival, Peugeot, had been installing similar filters since 2000 and was ramping up installation efforts ahead of anticipated new E.U. emissions requirements. In April 2005, the GSC decided to add a line to a Corning factory to build the filters, putting the company further into the red on diesel ($750 million program cumulative cash) than it had been for any other technology in its history. Diesel at the time was a $98 million business. As Volanakis explained, "We didn't think we would

be able to get into this business for several years, and suddenly we had this tremendous pull from the customer. So we said okay, do what you need."[17]

A similar level of corporate commitment was given to the telecom business in 2003. As one program manager recalled:

> It was 2003 and we thought the real growth for fiber-to-the-home would happen sometime in 2005. We thought we were giving ourselves plenty of time to get organized and have all the right structures in place before the business took off. But then Verizon announced its $23 billion FTTP program with the FiOS product in which it would be taking fiber-to-the-home for up to 18 million customers, which would require approximately one million miles of fiber. So by the middle of 2003 we were already working very closely with a very large customer.
>
> The good news was we got in on the ground floor of the largest fiber-to-the-home deployment in the world, outside of Japan. The bad news was that we were just getting ourselves organized as a program. So we got thrown right in and I found myself in front of the GSC in May 2003 just a few months after becoming the program manager. The GSC was very supportive. Everyone on the GSC was looking at this opportunity as being a way to turn telecom around. Through the relations established at all levels of Verizon from being a current supplier, by 2004 we had introduced a number of products and we were essentially up and running. In fact Wendell, from his days running the telecommunications business, had established a strong relationship with the leadership at Verizon, which was committed to building the world's leading fiber-to-the-home network. In 2007, this relationship enabled us to commission a collaborative team to engage our technology and Verizon's technologies and needs and determine how we might provide a solution that reduced their installation costs while allowing us to get our product out there, validated and into the hands of the customers.

Challenges

Going forward, the GSC's ability to advise, provide support, make quick decisions, and balance the company would be tested as Corning began to turn out new businesses at a faster rate. Some wondered whether the GSC's culture of "honest and frank dialogue" would be sustainable as group meetings got larger, and involved more people who did not have as long a history with Corning as the senior management team did. As one manager noted, "One of the things I worry about in the GSC is if it gets too much on its platter will these meetings turn into feel good sessions or the latest sales pitch on my program at Sullivan Park?"

There were also questions as to the GSC's ability to prioritize. As one program director noted, "the GSC will not be able to interact with programs at the same level it does today with all the new opportunities that are likely to come our way. The challenge going forward will be ensuring that the

[17] Jonathan Fahey, "Glass Menagerie," *Forbes*, April 24, 2006.

right growth opportunities go in front of the GSC at the right time and that we have the right program management structure and management talent in place." Following this train of thought, Jim Nagel, Division VP and Director, diesel technology, noted,

> The members of the GSC will have to make choices on what they look at and what they don't look at. They will have to make sure they stay focused on strategy and those strategic questions that keep the senior management team awake at night. The GSC should not be a problem solving body. I would rather have GSC members ask me the tough questions that I don't have answers to that I can sit and ponder about and come to the realization, 'Yes, you're right, I'm not thinking about this the right way.' It should be all about strategic questions relating to strategic business models.

In addition to confronting a growing number of new businesses that Corning hoped to launch, another challenge the GSC would face had to do with the fact that it would be exposed to very different businesses and business models. As Nagel pointed out,

> Most of the programs the GSC has worked with up to this point have been around since the council was formed. It will be increasingly challenging for the GSC to get its head around new businesses and business models in new markets that aren't near-space extensions. A lot of responsibility will rest on the shoulders of the program managers to ensure that the GSC gets a balanced presentation of information. They've got to be brutally honest with themselves and the organization as to where they are and where they are not.

Exhibit 1 Corning Stock Performance, 1995-2007

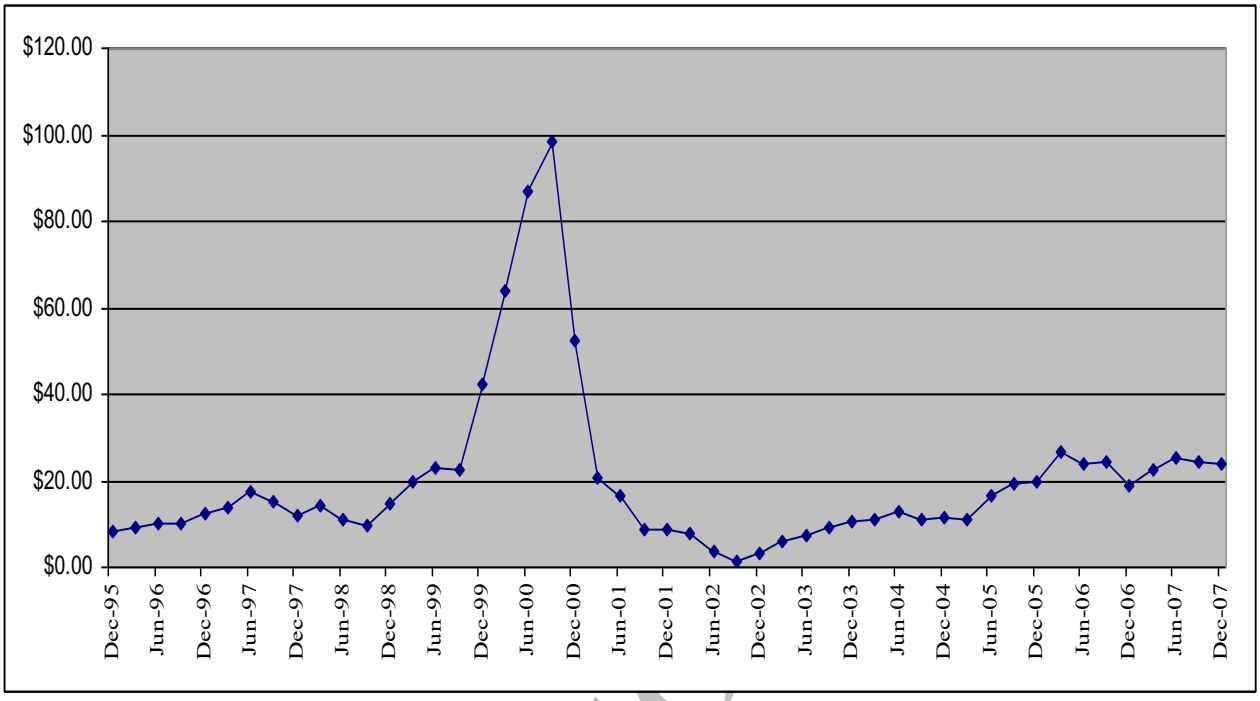


Exhibit 2 Corning Timeline

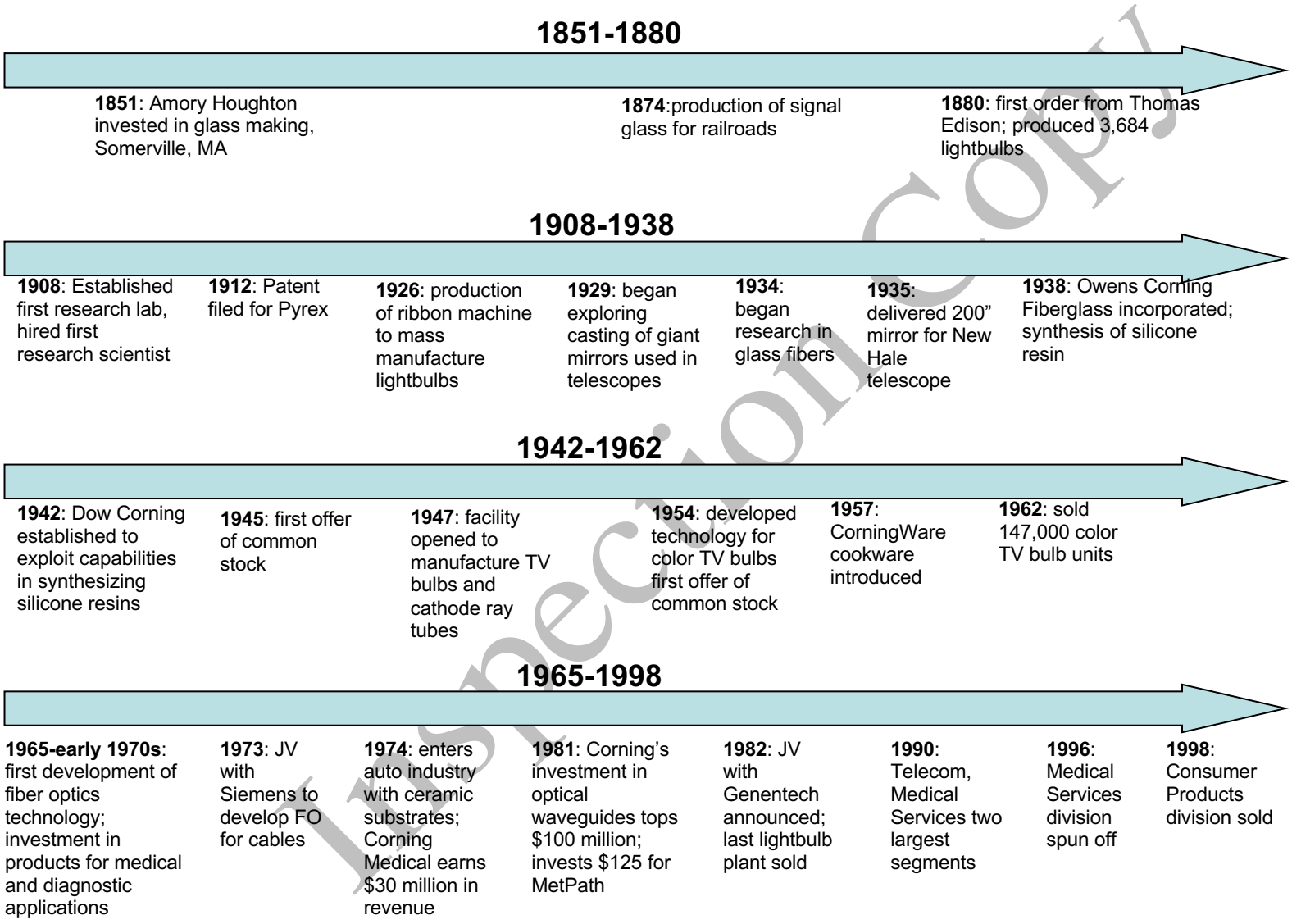
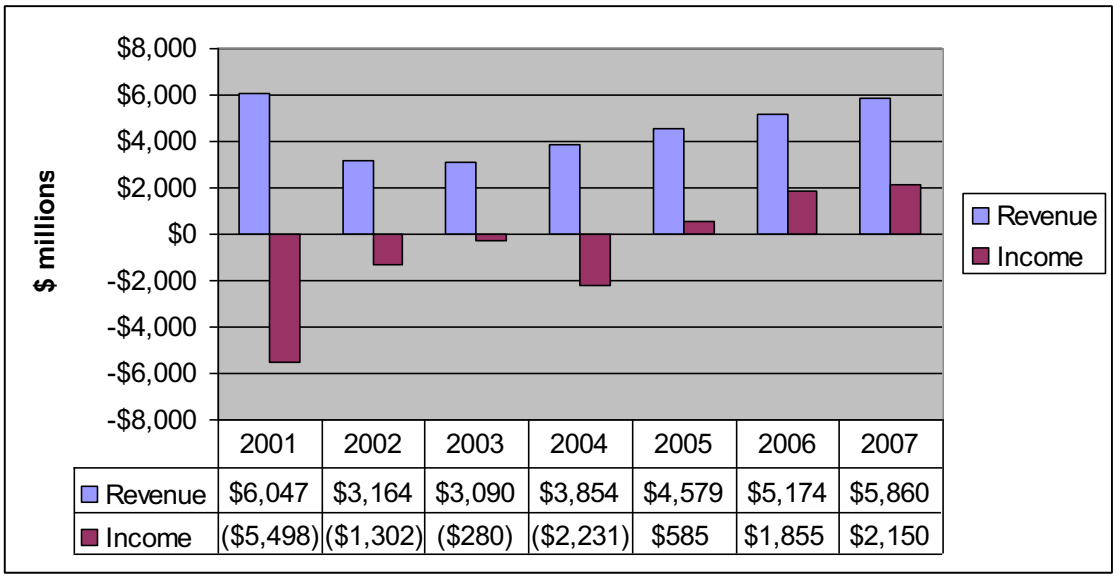


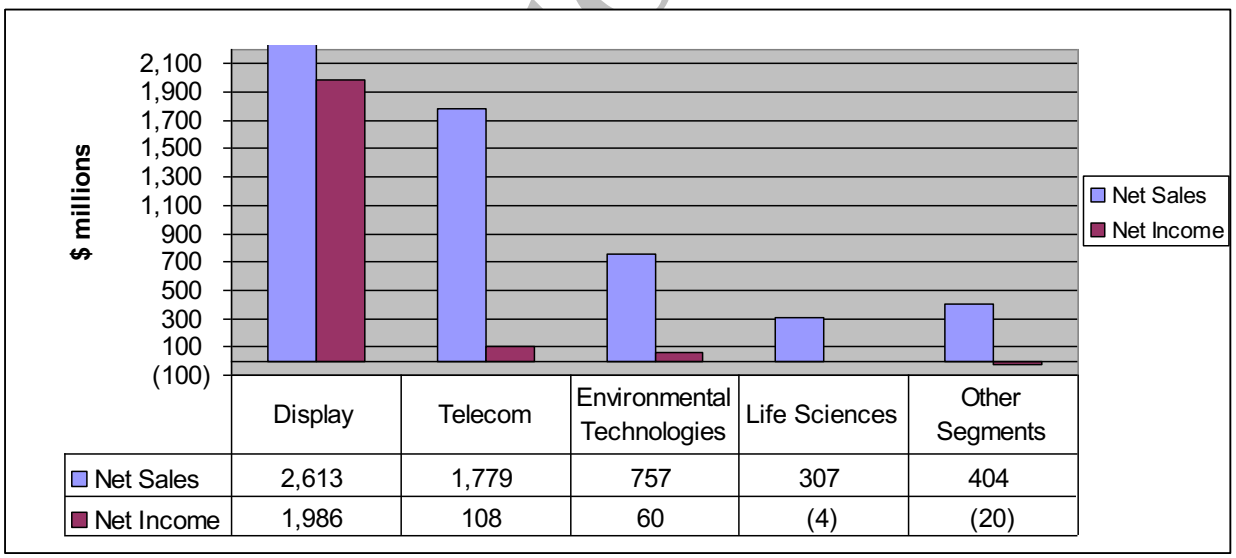
Exhibit 3a Corning Revenue and Income Results, 2001-2007



	2001	2002	2003	2004	2005	2006	2007
Revenue	$6,047	$3,164	$3,090	$3,854	$4,579	$5,174	$5,860
Income	($5,498)	($1,302)	($280)	($2,231)	$585	$1,855	$2,150

Source: Corning Inc. Annual Report, 2007.

Exhibit 3b Corning Net Sales and Income by Business, 2007



	Display	Telecom	Environmental Technologies	Life Sciences	Other Segments
Net Sales	2,613	1,779	757	307	404
Net Income	1,986	108	60	(4)	(20)

Source: Corning Inc. Annual Report, 2007.

Exhibit 4a Corning Result of Operations 2000-2006 (in millions, except per share amounts)

	2007	2006	2005	2004	2003	2002	2001	2000
Results of Operations								
Net sales	$5,860	$5,174	$4,579	$3,854	$3,090	$3,164	$6,272	$7,127
Cost of sales	3,111	2,891	2,595	2,439	2,241	2,562	4,380	4,131
Gross margin	2,749	2,283	1,984	1,415	849	602	1,892	2,996
Operating expenses								
Selling, general and administrative expenses	912	857	756	653	599	716	1,097	1,047
Research, development and engineering expenses	565	517	443	355	483	622	631	540
Amortization of purchased intangibles, including goodwill	10	11	13	38	37	43	439	245
Acquisition-related charges								463
Impairment and restructuring charges	(4)	54	(38)	1,789	111	2,080	5,725	
Other expense	185	(2)	218	65	413			
Operating (loss) income	1,081	846	592	(1,485)	(655)	(2,720)	(6,000)	701
Interest income	145	118	61	25	32	41	68	105
Interest expense	(82)	(76)	(108)	(133)	(154)	(179)	(153)	(107)
Other (expense) income, net	162	84	30	25	18	138	(26)	(8)
(Loss) income from continuing operations before income taxes	1,291	961	559	(1,604)	(759)	(2,720)	(6,111)	691
(Benefit) provision for income taxes	(80)	(55)	(578)	(1,084)	(254)	(726)	(452)	407
(Loss) income from continuing operations before minority interest and equity earnings	1,211	906	(19)	(2,688)	(505)	(1,994)	(5,659)	284
Minority interest in losses (earnings) of subsidiaries	(3)	(11)	(7)	(17)	73	98	13	(24)
Equity in earnings of associated companies, net of impairments	942	960	611	454	209	116	148	149
(Loss) income from continuing operations	2,150	1,855	585	(2,231)	(223)	(1,780)	(5,498)	409
Income from discontinued operations, net of income taxes				20		478		13
Net (loss) income	**$2,150**	**$1,855**	**$585**	**($2,231)**	**($223)**	**($1,302)**	**($5,498)**	**$422**
Financial Position								
Working capital	$2,782	$2,479	$1,490	$804	$1,077	$2,145	$2,113	$2,685
Total assets	$15,215	$13,065	$11,207	$9,736	$10,816	$11,406	$12,793	$17,526
Long-term debt	$1,514	$1,696	$1,789	$2,214	$2,668	$3,963	$4,463	$3,966
Shareholders' equity	$9,496	$7,246	$5,487	$3,701	$5,411	$4,691	$5,414	$10,633

Exhibit 4b Corning Select Financials by Segment (2004-2007) ($ in millions, % of total)

	Display		Telecom		Environmental Technologies		Life Sciences		All Other		Total
For the year ended 12.31.07											
Net Sales	$2,613	45%	$1,779	30%	$757	13%	$307	5%	$404	7%	**$5,860**
Research, development & engineering expenses	$125	29%	$82	19%	$126	29%	$55	13%	$42	10%	**$430**
Net income (loss)	$1,986	93%	$108	5%	$60	3%	$(4)	0%	$(20)	0%	**$2,130**
For the year ended 12. 31.06											
Net Sales	$2,133	41%	$1,729	33%	$615	12%	$287	6%	$410	8%	**$5,174**
Research, development & engineering expenses	$126	30%	$82	20%	$121	29%	$49	12%	$36	9%	**$414**
Net income (loss)	$1,617	97%	$7	0%	$7	0%	($17)	0%	$47	3%	**$1,661**
For the year ended 12. 31.05											
Net Sales	$1,742	38%	$1,623	35%	$580	13%	$282	6%	$352	8%	**$4,579**
Research, development & engineering expenses	$107	30%	$76	22%	$102	29%	$40	11%	$28	8%	**$353**
Net income (loss)	$1,239	99%	$68	5%	$15	1%	($4)	0%	($66)	0%	**$1,252**
For the year ended 12.31.04											
Net Sales	$1,113	29%	$1,539	40%	$548	14%	$304	8%	$350	9%	**$3,854**
Research, development & engineering expenses	$70	26%	$69	25%	$76	28%	$27	10%	$32	12%	**$274**
Net income (loss)	$717		($1,874)		$21		$16		$30		**($1,070)**

Source: Corning Inc. Annual Report, 2007.

Exhibit 5 Corning Organizational Structure

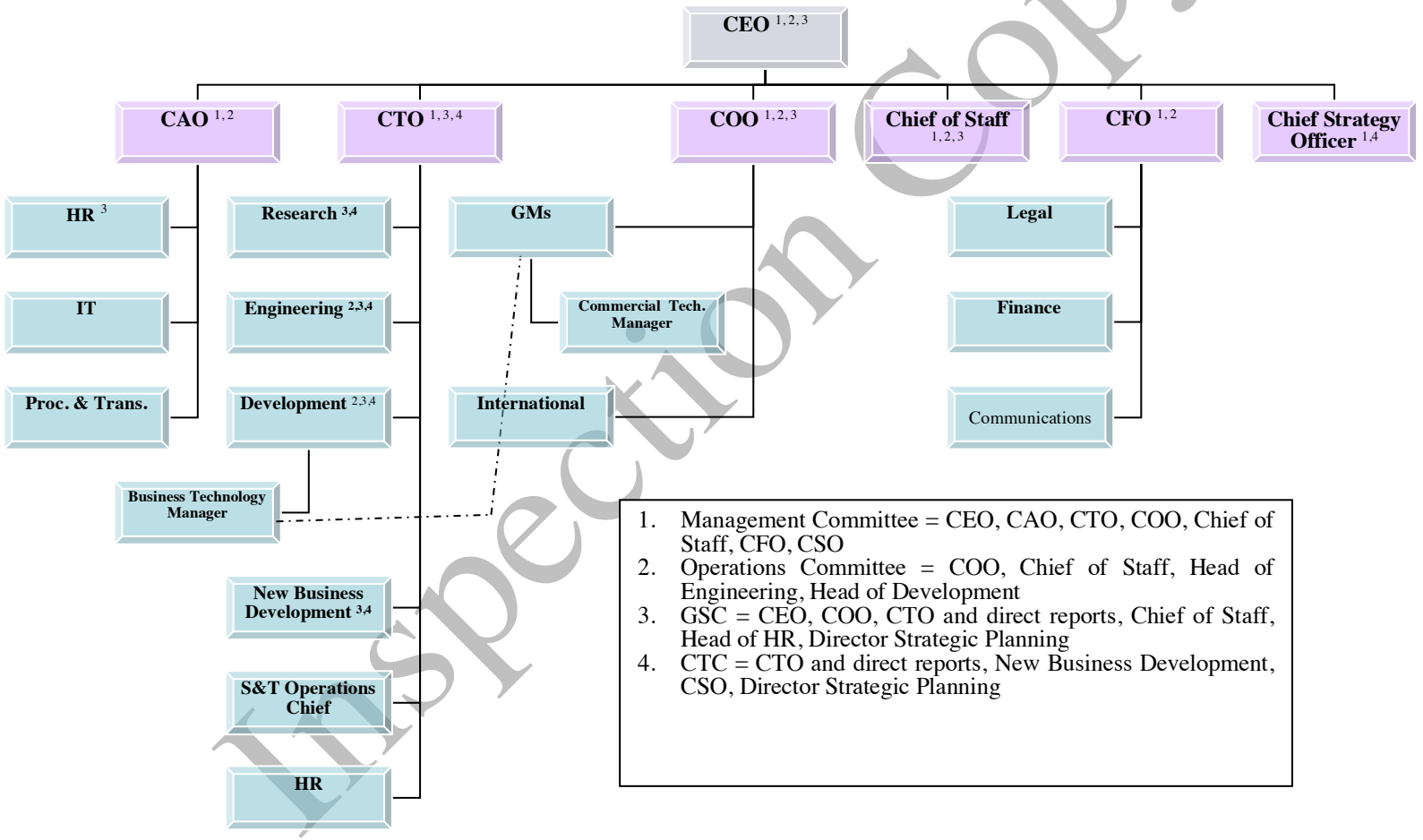


Exhibit 6 Key Annual Meetings with Corning Governing Bodies

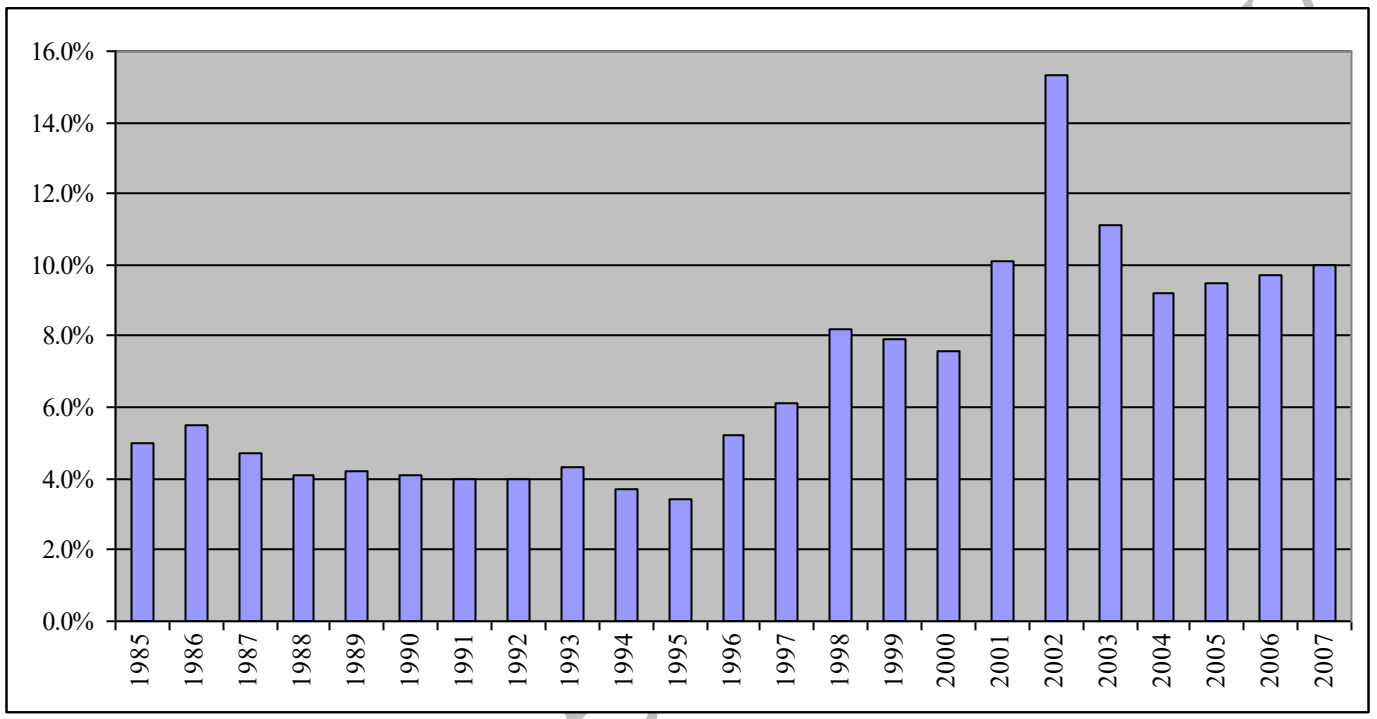
When	Who	What is discussed
January	Management Committee	Strategic agenda for the year, Annual Operating Plan
June	Management Committee	Annual strategy review with businesses: review 5-year plan; businesses provide specific financial forecasts for upcoming year and D&E budgets setting budgets and technology strategy and developing 5-year plans
July	Operating Committee	Annual operating plan, update of 5-year plan to ensure businesses are "on track"
September	GSC	Portfolio review, get down to the specifics of what businesses want to accomplish in coming year and how
	Operating Committee	Meets with businesses to regarding 5-year plans and any changes that had been made since July; OC give businesses targets for coming year
November	Management Committee	Budgets finalized

Management Committee: CEO, COO, CTO, CFO, CAO, Chief of Staff, Chief Strategy Officer

Operating Committee: COO, Chief of Staff, all GMs, Head of Development, Head of Engineering

GSC: CEO, COO, CTO and direct reports, Chief of Staff, Head of HR, Director Strategic Planning

Exhibit 7 Corning's RD&E Spending as % of Revenue, 1985-2007



Source: Internal Corning documents.

Exhibit 8 Growth and Strategy Council Meeting Calendar (example)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Display												
Project A												
Project B												
Project C												
Diesel												
Project A												
Project B												
Project C												
Telecom												
Project A												
Project B												
Project C												
Life Sciences												
Project A												
Specialty												
Project A												
Project B												
Strategic Growth												
Project A												
Project B												
Project C												