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GE's Imagination Breakthroughs: The Evo Project

As he prepared for the December 2006 meeting with GE's CEO Jeff Immelt, Pierre Comte faced some difficult decisions. Only eight months into his job as Chief Marketing Officer (CMO) of GE's Transportation business, Comte would be presenting Transportation's recommendations on some of the most visible growth initiatives in its locomotive business—projects that had been designated "Imagination Breakthroughs." IBs, as they were called within GE, were new projects with the potential to generate $100 million in new business within 2 to 3 years, and were a key part of Immelt's organic growth strategy. At the IB Review, Immelt expected to hear how Transportation was progressing with each of its locomotive IBs and what plans they had for their future.

Within GE Transportation, however, the future of several of the IBs had been a source of considerable debate. But none was more sensitive than the Hybrid locomotive, a bold new project launched two years earlier in the belief that it had the potential to become a disruptive technology that could redefine the industry. But developing cost effective designs for the hybrid was an ongoing challenge, and some of its key sponsors were beginning to wonder if resources should continue to be committed to it. This ongoing debate had resurfaced in November at a growth review meeting in Erie, Pennsylvania, where Transportation's CEO John Dineen asked Comte and Brett BeGole, head of Transportation's locomotive P&L unit, to describe how they planned to update Immelt on the Hybrid IB. BeGole, an experienced and effective business leader, explained that problems with the cost and performance of batteries had made the project's future highly uncertain. Feeling it was sapping resources from more profitable growth opportunities, he recommended that it be sidelined until the technology was further developed.

Comte was uncomfortable with that proposition. He felt that the Hybrid represented a real opportunity for GE to lead fundamental market change, and that sidelining the project could cause it to lose the resources and attention it needed at this critical stage of its development. He also worried about Immelt's reaction, especially since the Hybrid was one of his favorite IB projects. But while he knew that the Imagination Breakthrough process was designed to encourage risk-taking, Comte also realized that at the end of the day, it had to be commercially viable. In GE, the bottom line always mattered.

As Dineen listened to his direct reports, he understood the source of their differences. BeGole was responsible for the profitability and growth of the Locomotive P&L unit, and would be held accountable for its bottom-line results. But Comte, with his mandate to develop market knowledge and competitive intelligence, had been asked to challenge and stretch the existing organization.

Professors Christopher A. Bartlett and Brian J. Hall and Research Associate Nicole S. Bennett prepared this case. HBS cases are developed solely as the basis for class discussion. Some company information and data have been disguised for confidentiality. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

Indeed, Dineen recalled telling his new CMO, "Pierre, your job is to make marketing 'the point of the spear'; to take us to places we don't want to go." Now, after listening to the debate, Dineen wondered what Transportation's position on the Hybrid should be in its upcoming IB Review with Immelt.

Immelt Takes Charge: New Demands, New Responses[a]

On Friday, September 7, 2001, 43-year-old Jeff Immelt became GE's ninth CEO in its 109 year history. Four days later, two planes crashed into the World Trade Center towers. In the turmoil that followed, an already fragile post-Internet bubble stock market dropped further, and the subsequent downturn in the economy resulted in a drop in confidence that spread rapidly around the globe.

Despite his many efforts to tighten operations while continuing to grow the business, the new CEO did not have an easy initiation as he tried to deal with the resulting economic downturn, the post-Enron suspicions of large corporations, and the growing global political instability. In 2002, after promising that earnings would grow by double digits, Immelt had to report a modest 7% increase in GE's profits on revenues that were up only 5% on the 2001 sales, which had declined 3% from the prior year. (See **Exhibit 1** for GE Financials, 1996-2006.) By the end of 2002, GE's stock was trading at $24, down 39% from a year earlier and 60% from its all-time high of $60 in August 2000. With considerable understatement, Immelt said, "This was not a great year to be a rookie CEO."[1]

Driving Growth: The Strategic Priority

Beyond this immediate market pressure, Immelt was acutely aware that he stood in the very long shadow cast by his predecessor, Jack Welch, under whose leadership GE had generated a total return to shareholders of 23% per annum for 20 years, representing an astonishing $380 billion increase in shareholder wealth over his two decades as CEO. Much of the company's stock price premium was due to the fact that Welch had built GE into a disciplined, efficient machine that delivered on its promise of consistent growth in sales and earnings. The results were achieved in part through effective operations management that drove a 4% per annum organic growth rate (much of it productivity driven), but primarily through a continuous stream of timely acquisitions and clever deal making. This two-pronged approach had resulted in double-digit revenue and profit increases through most of the 1990s.

But Immelt knew that he could not hope to replicate that kind of performance by simply continuing the same strategy. The environment in the new millennium had changed too much. The new CEO wanted to use GE's size and diversity as sources of strength and to drive growth by investing in places and in ways that others could not easily follow. He began to articulate a strategy that would rely on technology leadership, commercial excellence, and global expansion to exploit what he described as "growth platforms"—businesses that would capitalize on "unstoppable trends."

Beginning in 2002, he challenged his business leaders to identify new growth platforms with the potential to generate $1 billion in operating profit within the next few years. In response, several opportunities emerged, and the company soon began engaging in new fields such as oil and gas technology, securities and sensors, water technology, Hispanic broadcasting, and consumer finance, all of which were growing at a 15% annual rate. "The growth platforms we have identified are in

[a] This section summarizes "GE's Growth Strategy: The Immelt Initiative," Harvard Business School case # 9-306-087.

markets that have above average growth rates and can uniquely benefit from GE's capabilities," said Immelt. "Growth is *the* initiative, *the* core competency that we are building in GE."[2]

Building New Capabilities: Investing in Technology and Marketing

To reposition GE's portfolio to leverage growth, Immelt's team lost little time in acquiring companies such as Telemundo to build a base in Hispanic broadcasting, Interlogix in security systems, BetzDearborn in water processing services, and Enron Wind in renewable energy. After completing $35 billion worth of acquisitions in 2001 and 2002, GE completed the biggest acquisition year in its history in 2003, including two megadeals: $14 billion for media giant Vivendi Universal Entertainment (VUE), and $10 billion for UK-based Amersham, a leader in biosciences.

But Immelt also recognized that he would have to make internal investments to ensure that his strategy of technology-driven, commercially-oriented global expansion could build on this new growth platform. Within his first six months as CEO, he had committed $100 million to upgrade GE's major R&D facility at Niskayuna in upstate New York. He followed that investment with a 2002 authorization to construct a new Global Research Center (GRC) in Shanghai, and a 2003 authorization for another GRC in Munich, investments involving another $100 million dollars. And despite the slowing economy, he upped the R&D budget 14% to $359 million in 2003. When asked about the increase in spending during such a difficult time for the company, he said, "Organic growth is the driver. Acquisitions are secondary to that. I can't see us go out and pay a start-up $100 million for technology that, if we had just spent $2 million a year for 10 years, we could have done a better job at it. I hate that, I just hate that."[3]

Rather than concentrating primarily on short-term product development as it had in the past, the GRCs' agenda become more long-term oriented. It also became more focused, with more than 1000 projects slashed to just 100. Furthermore, the research group identified five very long-term technology areas for special attention, representing fields as diverse as nanotechnology, advanced propulsion, and biotechnology. It was a longer-term R&D focus than GE had seen for many years.

The other core competency with which Immelt wanted to drive organic growth was marketing. As an ex-salesman, he had always focused on the customer and felt that an unintended by-product of Welch's obsession with operating efficiency and cost cutting had been the development of a culture that was too internally focused. He wanted the organization to turn its attention to the marketplace and to bring in a more commercially-oriented perspective to its decisions.

One of Immelt's first appointments had been to name Beth Comstock as GE's chief marketing officer, a position Welch had abolished decades earlier. (See **Exhibit 2** for the GE's corporate organization chart.) He also redeployed most of GE's large acquisition-oriented corporate business development staff into marketing roles, and asked each of GE's businesses to appoint a VP level marketing head to develop that capability in the business. Because of the shortage of internal talent, many of these marketing leaders had to be recruited from outside, an uncommon practice at GE.

To provide a forum for these new leaders to monitor and drive the change he wanted, in 2003 Immelt formed a Commercial Council made up of 20 respected commercial leaders drawn from a diverse range of GE businesses. Not all members were Corporate Officers, or even among the top 600 in GE's Senior Executive Band, but all shared the distinction of being personally selected by the CEO for their innovative thinking. Meeting monthly by phone and quarterly in person, it was a forum to discuss mega-trends, to identify broad strategies for international growth, and to diffuse best marketing practices rapidly throughout GE. To underline its importance, Immelt chaired it.

Realigning Personal Competencies: Developing "Growth Leaders"

The investment in new capabilities had an immediate impact on GE's management profile. Within Immelt's first two years, the company had recruited over 5000 engineers, and among the 175 corporate officers, the number of engineers grew from seven to 21. The same dramatic change was occurring in sales and marketing, and in 2003, the company began a process to increase GE's under-resourced marketing staff by 2000 over the next two years. To help integrate this influx of senior level marketers into GE's culture and systems, the Experienced Commercial Leadership Program was created.

As big a task as it was, recruiting top talent into these growth-driving functions was less of a concern to the CEO than the challenge of developing new capabilities in his current management team. While strong in operations and finance, some lacked the skills Immelt felt they would need to succeed in the more entrepreneurial, risk-taking environment he wanted to create. To help define the leadership behaviors that would be required to drive organic growth, the human resources staff researched the competency profiles at 15 large, fast-growth global companies such as Toyota, P&G, and Dell. They concluded that five leadership traits would be key to driving organic growth in GE:

- An external focus,
- An ability to think clearly,
- Imagination and courage,
- Inclusiveness and connection with people, and
- In-depth expertise.

Soon all courses at GE's famed Crotonville education center were focused on developing these characteristics, and Immelt made it clear that unless managers had these traits or were developing them, they would not be likely to succeed at GE regardless of their past track record. And to underline his commitment to supporting a new generation of "growth leaders," he began making changes to some of GE's well-established norms and practices. For example, to develop leaders with more in-depth market and technological knowledge and domain expertise, Immelt decided to slow down the job rotations that had long been central to management development at GE; to build new technological and marketing capabilities rapidly, he accepted the need to recruit from the outside; and to encourage individuals to take risks, and even to fail, he adjusted the evaluation and reward processes that previously had been tied to flawless execution of short-term budget objectives.

Embedding Growth in Processes and Metrics

In classic GE form, all elements of the new organic growth initiative were soon being reinforced in metrics, systems, and processes to ensure that the new objectives received the disciplined follow up that characterized GE's management style. It was this cycle of tightly linked and mutually supportive systems and processes and that were the backbone of the company's Operating System that supported GE's well-deserved reputation for clear strategy and a disciplined implementation.

At the heart of the Operating System were three core processes that had framed management reviews over many decades—Session C, Session I, and Session II. (See **Exhibit 3** for a graphic representation.) Each had been harnessed to drive the growth agenda. For example, the Session C organization, staffing, and succession reviews each May became a powerful tool to reinforce the recruitment, promotion, and deployment of technological and marketing talent, as well as the development of a new generation of "growth leaders" willing to take risks to build new businesses. Next, in July, Session I (the strategic reviews that Immelt renamed Growth Playbook reviews) required each business to drill down on how market trends and customer needs provided

opportunities for them to grow their business organically. And in November's Session II, discussions of the operating budget (driven by stretch targets rather than itemized expenses in the GE practice) made sure that each business's commitments to invest in and deliver on growth projects were not cut back in order to meet short-term performance objectives.

And the metrics employed in the implementation of each of these systems were also changed to reflect the new growth objectives. For example, all development reviews and performance evaluations leading up to Session C now evaluated managers against the new growth traits. In the first year, only Corporate Officers were evaluated; the following year, the metrics were extended to the 600 in the Senior Executive Band; and by year three, the top 7000 executives were getting feedback and development support around the growth traits. In the Session I/Growth Playbook review, managers were expected to develop and defend their strategies to achieve Immelt's overall objective to increase GE's organic growth rate from 4% to 8% annually. And in Session II, a new Net Promoter Score was added to hold managers accountable for a demanding measure of customer loyalty and repurchase.

Imagination Breakthroughs: Engine of Organic Growth

By the end of 2003, Immelt told investors that he had now completed the big investments needed to re-position the company's business platforms for the future. But results were still disappointing, and with both income and revenue barely above the levels of 2000, some observers were beginning to question whether the GE's greatest growth was behind it. Immelt rejected that notion, and saw no reason for GE to slow down as long as it was able to change its approach and emphasize organic growth. "In the late 1990s, we became business traders not business growers," he said. "Today, organic growth is absolutely the biggest task in every one of our companies."[4]

Having spent his first two years repositioning the business portfolio and investing in new organizational capabilities, Immelt now wanted to drive the pursuit of organic growth much deeper into the company. In September 2003, he convened a meeting of marketing directors from each of GE's businesses and gave them a challenge: in two months he wanted each of them to develop five proposals for new growth businesses – "Imagination Breakthroughs" he called them, or IBs as they quickly became known. "We have to put growth on steroids," he said. "I want game changers. Take a big swing."[5]

Over the next two months, the marketing leaders engaged management at all of GE's businesses to respond to Immelt's challenge. Working furiously, they developed 50 IB proposals that were then presented to the CEO and a small group of corporate marketing staff who now became the IB Review Committee. Of this initial portfolio, the CEO green-lighted 35, which the businesses were then expected to fund, explore, adapt, and pursue. And Immelt indicated that he intended to monitor progress closely.

GE Transportation's First IB: The Evo Story

In September 2003, in response to Immelt's request, GE Transportation identified five potential IBs. Perhaps the most exciting was the Evolution Locomotive, a product that was already on the shelf as a planned new product introduction or NPI. But it was a project with which the business had been struggling due to challenges in both its technical development and its market acceptance. The designation of this project as an IB turned a corporate spotlight on its funding and put a supercharger on its commercialization.

Origins of the Evolution Locomotive

GE began serving the North American rail market in 1918, and through numerous cycles over the better part of the next century, the company steadily built a good business selling to North America's six large rail companies. By the mid-1990s, with revenues approaching $2 billion, GE had built a dominant market share, and its AC4400 long-haul locomotive was recognized as the most successful engine on the market. But it was a mature and conservative industry, and an unlikely place to jumpstart an initiative that called for cutting-edge technology, innovation, and risk taking.

In a rare innovative move in the industry, in 1995 GE introduced its much anticipated "super-loco," the AC 6000 CW. Touted as the most powerful locomotive on the market, its size and hauling capability were impressive. But within a year of its launch, North American customers were reporting that most of the 6000's new capabilities were unnecessary or uneconomical. This unfortunate misreading of market needs led to only 207 units of the 6000 being sold over the next 5 years compared to more than 3000 classic 4400 locomotives in the same period.[6] Worse, many of those that were sold either failed to deliver on their promised cost-benefit performance or had reliability problems. The 6000 locomotive was eventually discontinued and became a black eye on GE's otherwise strong record in the industry.

In December 1997, Environmental Protection Agency (EPA) upset the previously predictable rail market when it announced the first in a series of strict emissions requirements of all new locomotives to be put in service after January 1, 2005. The regulations posed serious engineering challenges and a major commercial risk for locomotive manufacturers whose safest response was to modify existing models to meet the new standards. While its competitors chose to follow this conservative strategy, GE engineers proposed taking a riskier and more expensive approach: they committed to designing a completely new platform that would be able to meet future emissions standards while also keeping fuel costs down.

Over the following three years, engineers in Erie and at the Global Research Center in Niskayuna worked to redefine the paradigm of locomotive design by eliminating the traditional tradeoff between fuel efficiency and emissions. The result was the Evolution Locomotive (quickly dubbed the Evo) which used a revolutionary engine combined with a patented cooling system to achieve 3% to 5% fuel savings while generating 40% less emissions than the previous generation. It also incorporated a locomotive control system enhancement that managed the speed and throttle settings to minimize fuel consumption and/or emissions, taking into account train composition, terrain, track conditions, train dynamics and weather, without negatively impacting the train's arrival time.

Though this radical new engine represented a clear technical advancement, the decision to take it from design to production was a gamble. Because locomotives delivered before January 1, 2005 were exempt from the new regulations, some predicted that there would be a spike in demand for old models in 2004, leaving a very small market for the Evo in 2005. Indeed, the sales force reported that most customers were wary about making early commitments to meet the new requirements. But the believers on the GE team argued that the Evo could deliver real savings in fuel and labor, areas in which costs were mounting rapidly in the rail industry. In a major strategic bet, in 2002 GE committed to building its Evolution locomotive. (See **Exhibit 4** for a photo and basic specifications of the Evo.)

Evo Becomes an IB

The earlier AC6000 product failure coupled with the looming change in environmental regulations in the industry put the locomotive business leaders in Erie under intense pressure to

prove to the CEO that they could grow their mature business organically. When Immelt announced his quest for $100 million Imagination Breakthroughs, it was clear that the Evo would be a "make or break" project. Despite the continuing uncertainty around its market potential, the Evo became the centerpiece of Transportation's presentation in its first IB Review with Immelt. The CEO was immediately taken by the project's potential and told the sponsoring managers that he would be monitoring progress in regular review meetings he planned to conduct monthly with those responsible for IBs.

True to his word, Immelt conducted reviews of a subset of IBs every month. As a result, every six months or so, those directly responsible for Evo—the P&L leader, the technology leader, and/or the marketing leader—met with him to describe progress and outline next steps for their project. As the team soon learned, PowerPoint presentations were strictly prohibited in these meetings with Immelt and a few members of his corporate marketing staff. To encourage an atmosphere of discussion and debate, presenters were allowed no more than one page of documentation for each IB. Although the meetings were small and informal, the managers were not necessarily relaxed. They knew that questioning would be intense, and were advised to be prepared to discuss a range of sample questions. (See **Exhibit 5** for a preparatory list.) And meeting the CEO in intimate settings to discuss new ideas created some tension. As one manager reflected, in a context in which other business's IBs were being presented, "Do you really want to be the only business that shows no imagination and no breakthrough?"

Managers came to IB review meetings armed with extensive market information, the result of a rigorous analytical process called CECOR that was being rolled out by the corporate marketing group to help business level marketing teams systematize analysis to support the IB process.[b] (See **Exhibit 6** for an outline of the CECOR process and tools.) Because of Immelt's understanding of the issues and his direct, in-depth questioning, the IB Reviews were soon recognized as a "Committee of One."

In the glare of the IB spotlight, the Evo product management and sales team found themselves under increased pressure to perform. But discussions with customers revealed that GE was still "paying for sins of the past" as one salesman put it, and the team concluded that it would not be able to sell the Evo's value proposition from a piece of paper and a set of specifications. After the failure of the AC6000, customers wanted solid evidence of the benefits being promised.

In a leap of faith, GE Transportation took the financial risk of committing $100 million to build 50 Evo units, which they then planned to lease to customers for $1 per year. The locomotives were to be carried on GE's books, but would be operated by customers and used on their North American lines. The goal was to log five million miles before the 2005 launch, thereby regaining customers' trust by proving the engine's reliability and the value of the technological advancements.

Preparing to Launch: The Agony…

In early 2004, vague concerns about Evo began turning to panic. A year into the leasing plan, the sales team did not have a single firm order. Sales reps were getting positive feedback about performance of the leased Evos, but customers were still reluctant to make the capital expenditure. Transportation's November SII Budget Review for Evo had been grim: worst-case scenarios projected sales of only 30 or 50 locomotives out of a total 2005 capacity of 600 Evos. It was a performance that would result in significant losses. While some felt that GE might have to offer the Evo at an attractive

[b] CECOR stood for, Calibrate, Explore, Create, Organize, and Realize, an analytical process that the corporate marketing group had developed. It was supported by a portfolio of tools borrowed from a variety of sources including the consulting groups Bain and McKinsey, which had proved helpful in doing market segmentation, customer analysis, competitive analysis etc.

initial price to attract sales, Immelt strongly disagreed. At IB Review meetings, he was pushing the team in the opposite direction, urging them to focus on how to price the soon-to-be-launched product to capture its full value.

Because the Evo offered significant economic savings to the railroads over its lifecycle, Immelt believed strongly that it could be sold a premium over the previous model. Discussion about the impact of rising energy costs in the IB Review meetings spilled over into detailed market and product analysis in Growth Playbook sessions. These meetings with Immelt were very different from the Session I strategy reviews over which Welch had presided. Where Welch had been cost and efficiency-driven, Immelt was focused on the market value of technological advancements like the Evo. "In a deflationary world, you could get margin by working productivity," Immelt said. "Now you need marketing to get a price." [7]

As a result of these discussions, the IB team refined Evo's value story to focus on its lifecycle costs, and decided to reflect the Evo's significant performance improvements in a 10% price premium . Knowing that this decision would cause anxiety within the sales ranks, Dave Tucker, Transportation's VP of Global Sales turned the annual January sales meeting in Coco Beach, Florida into a call to arms for the Evolution. In the opening session he announced that by June the sales team not only needed to sell out the factory, they needed to do it at a significant premium over the previous model. "It scared the hell out of the sales force," Tucker recalled. "Frankly, we had never had a step function increase in pricing like that."

Tucker then challenged his sales force to come up with the means to implement the plan. In addition to worries about the expected customer reaction, some expressed concerns about the likely response of a key competitor who had not made the same upfront investment. But the marketing group's analysis suggested that rising oil prices, increased rail traffic, and tightening emission standards could make customers more open to Evo's benefits. After several days of joint discussions with marketing and product management, the sales force hit the streets committed to booking orders at the new price.

Implementing the Launch:…The Ecstasy

Over the following months, the sales team went back to its customers, emphasizing value to convince them that Evo was worth its price premium. As if responding to a cue, in early 2004 oil prices began to increase from $32 a barrel in January, to $40 by June, and $50 by October. At the same time, driven by surging Chinese imports entering the US on the West Coast, transcontinental rail traffic was increasing dramatically. And new interest from state regulatory bodies was making emissions an industry-wide concern. The marketing analyses had proved correct: customers were ready for the Evo.

By the launch date on January 1, 2005, not only was the entire 2005 production of Evo was sold out, product was on backorder through much of 2006. Despite earlier concerns about a risk of a temporary drop in market share, industry experts estimated that GE maintained or increased its 70% share through the launch and outsold its competition by three to one in the US market during 2005.[8] By mid-2006, there was a backlog of 1500 locomotives, representing nearly two years of production capacity. The early success of the Evo continued into 2007, with all-time highs in deliveries surpassing records set just one year earlier. The Evo had become a poster child IB success story.

Managing the IB Lifecycle: Raising the Evo Babies

When John Dineen became CEO of GE Transportation in the summer of 2005, Evo was well on its way to being one of the outstanding IB successes. But Dineen made it clear that he wanted to drive even more growth from this old-line, mature portfolio of businesses. To emphasize that objective, he reinforced Immelt's annual corporate Growth Playbook process by creating a Growth Council, to which he invited his entire management team to engage in a monthly review of growth initiatives in each of Transportation's businesses. His objective was to build a growth agenda into the pulse of the business and make it part of the ongoing management discussion.

Birth of an Evo Baby: The Global Modular Locomotive

Acknowledging that the slow growth domestic markets already dominated by GE were unlikely to be the major source of new business, Dineen emphasized the opportunities for international expansion. Responding to that challenge, Tim Schweikert, general manager of the Locomotive P&L unit, began to explore with his team the challenge of breaking into the global locomotive market. Very quickly, they identified the hurdles they would have to clear in order to sell internationally. First, because railway gauge width, weight limits, and clearance requirements varied widely from country to country, they decided that there could be no standardized "global locomotive." Furthermore, the low numbers of locomotives called for in most international tenders (as few as 10 or 15) made the huge upfront investment in engineering a major cost barrier. And finally, because governments were typically the operators of railways, the selling process usually involved complex political negotiations.

Recognizing all these constraints, Schweikert and his team developed a product concept that they termed the Global Modular Locomotive (GML), a design developed around a set of standard components that could be built to different national requirements using a Lego-like approach to the locomotive's construction. With great excitement, they took their idea to Dineen's monthly Growth Council where it was quickly endorsed as a candidate for Immelt's IB Review. Presenting their ideas in this forum in September 2005, the locomotive team preempted Immelt's opening question by identifying GML's three value-creating objectives: to reduce the response time in international tender processing, to reduce the amount spent on nonrecurring engineering, and to reduce the time between the order and the sale. After further probing questions, Immelt congratulated them and approved GML as an IB.

To help Schweikert implement the new IB project, Dineen assigned Gokhan Bayhan to the role of marketing leader for the Locomotive P&L unit. The move was part of a larger strategy of transferring recognized talent into the fledgling business marketing roles. "We took some of our best people from our commercial and engineering organization and put them into these roles," said Dineen. "As soon as you start doing that, the rest of the organization realizes it's important. Initially, we had to draft people and assure them that the move was going to be good for their careers. But it was hard. Every bone in their body was telling them not to do it because there was no track record." (See **Exhibit 7** for GE Transportation's organization chart.)

Because Bayhan had earlier worked on a locomotive modernization contract that GE had won to overhaul and rebuild 400 locomotives for the state-owned railway in Kazakhstan, he decided this was a perfect place to explore GML's potential. Soon, he and the sales team were talking to government contacts about the new concept and about the opportunity for GE to help them expand and modernize their railway system to meet the needs of Kazakhstan's fast-growing China trade.

The disciplined process of analyzing the market opportunities and customer needs was part of the rapidly expanding marketing group's responsibility. Because it was a new element in the existing process of bringing a product to market, gaining acceptance was not always easy, as Bayhan explained:

> The relationships between product management, sales, and engineering were well-established, so a lot of marketing team members had difficulty breaking into that process, and taking on a role that didn't exist before. It was hardest for those from the outside, and they were the majority. It helped that I'd been in the organization in various product management and finance roles because it allowed me to use my access and credibility to contribute a marketing point of view. But lots of others had a hard time with it.

Meanwhile, as sales, engineering, and marketing worked together to test and approve the GML concept, a major boost to the effort occurred in December 2005 when the company announced that it had received an order for 300 GML locomotives from the Chinese railway. In October, Tim Schweikert, who had been close to the Chinese negotiations was transferred from his position in Erie to become head of GE transportation in China, not only to oversee this important contract, but to use it to expand GE's penetration into this huge market.

Making Marketing Mainstream

As the role and impact of the marketing function grew within Transportation, Dineen accelerated his efforts to find a head of marketing who not only could spearhead and accelerate existing marketing efforts, but also could provide the function with greater access and influence at the most senior levels of discussion in the company. Finally, in early 2006, he found the person he felt could fill the role. Pierre Comte became Chief Marketing Officer of GE Transportation in May, 2006. Surprisingly, although he had a strong commercial background built up through an international career, he did not come from a traditional marketing background. Most recently he had run the rail signaling business at a major European transportation company. But to Dineen, he seemed an ideal fit—someone with relevant industry expertise, good frontline experience, and a strong enough personality to be able to deal credibly with his P&L leaders, and understand their pressures and constraints.

In his first meeting with his new CMO, Dineen told Comte to "create a crisis around growth." But Comte realized that first he would have to convince his bottom-line driven peers that he could help them:

> When you run a $2 billion Locomotive P&L that's doing great, you don't have a pressing need to reinvent yourself and your business. The role of marketing group is to push the P&L leaders to revisit their portfolios. But they won't listen to chart makers or theoreticians. So I spent three months telling them, "I'm like you, I'm a business guy; I've lived in Asia and Europe. I've run a P&L with a couple of thousand people reporting to me. I know that the last thing you want is another headquarters guy giving you more work to do. I'm not going to do that. I'm here to help you make your P&Ls bigger, stronger."

Under Comte, the new marketing team began to take a more active role in the business, a role that became more and more evident as the Evo babies started to grow. The contributions Gokhan Bayhan made to the redefinition of GML provided a classic example.

The Baby Grows into a Family

In April 2006, as members of the locomotive management team sat down to prepare for their presentation to Immelt at Transportation's Growth Playbook/Session I review in June, some of the initial ideas behind the GML concept were beginning to seem questionable. Doubts were being expressed by people from project management, marketing, and engineering about whether the GML's Lego design would work in practice. To resolve the concerns, Brett BeGole, Schweikert's replacement as global operations general manager for the Locomotive P&L unit, commissioned a Tiger Team of six people from engineering, product management, and marketing and gave them two weeks to recommend what changes, if any, should be made to the GML concept.

Much of the team's work was based on a rigorous analysis of a rich set of data on customers, competitors, and market trends that Gokhan Bayhan had assembled. Using CECOR tools including a customer needs analysis, a competitive response analysis, and a market segmentation map, Bayhan presented Steve Gray, his engineering counterpart on the Tiger Team, a rich picture of the critical technical and quality elements that customers were demanding.

After an intense two weeks of analysis, the team came to the conclusion that the GML concept was too complex and too expensive to serve the market efficiently. Instead, they proposed that GML's modular approach be replaced by a platform concept that defined five different families of locomotives which together would serve 85% to 90% of the global market demand. Three of the five platforms to be developed were based on the Evo engine, while the two other family members would use another engine still under development.

The Tiger Team's recommendations were presented at Transportation's Growth Council in May, where Dineen backed their recommendation by committing to invest in the development engineering required for the Global Locomotive Families (GLF) ahead of any orders being received. It was a major change in practice for the business. With strong analysis and data to support their proposal and a clear commitment to invest in it, the new GLF concept was quickly accepted and supported in July's Growth Playbook /Session I review with Immelt and became one of Transportation's official IBs.

The concept was soon validated when, in September of 2006, the Kazakhstan Railway placed an order for 310 locomotives valued at $600 million; soon after, GE received an additional large order from a mining company in Australia; and before year's end it won a tender for 40 more locomotives in Egypt. Bayhan described it as the industry's "perfect storm":

> The big driver was what we call the 'China Effect'. Our analysis showed how increased trade with China is driving a big surge in demand for all forms of transportation. Around the world, GDP is growing, industrialization is happening, and the China Effect is spreading to other countries. And we were right there when it happened with a good understanding of the customers' needs and the newest technology to meet them. So we were able to respond to the perfect storm with a great product, the right commercial strategy, and perfect market timing.

Like the China order nine months earlier, the big Kazakhstan order came with a condition that after building the first 10 locomotives in Erie, GE would commit to transferring the assembly operation to Kazakhstan in the second half of 2008. The facility would assemble kits shipped from Erie and would become the regional source for locomotives sold to other countries in the CIS (consisting of eleven former Soviet Republics in Eurasia). It was part of GE's "In Country, For Country" international strategy, and a matter of great pride for the country's prime minister, who proudly announced that Kazakhstan had locomotives with the same technology as the US models.

The Morphing Continues: The New Regional Strategy

As the locomotive contract negotiations were being finalized, they provided a convenient market entrée to other parts of GE's transportation business. In particular, the sales and marketing people from the Services and Signaling P&Ls began using the Locomotive team's contacts to introduce their own products and services. For example, Transportation's Service P&L planned to link any new locomotive sales with a service contract to renew and refurbish worn components locally rather than replacing them with imported new parts. Not only could they promise to save the customer money, they could offer to transfer technology and bring employment to the country.

As initiatives such as this became the norm in markets where locomotive contract had been signed, the management team of the Locomotive P&L began to explore whether an integrated regional approach to growth might be a more effective business model than the product-based Global Families approach. It was an approach that Comte believed had great value. As he grew the Transportation marketing staff from 14 people to 32, he began moving a significant number of them out of Erie and into the field where they could be closer to the customer. As part of a new geographic-based capability, he deployed seven Regional Marketing Strategists, each of whom built his own local capabilities to support Transportation's regional General Managers. (See **Exhibit 8** for Transportation's marketing organization.)

In December 2006, when the message came down that the Commercial Council would like to see businesses submitting IB proposals for new emerging countries, it gave support to the growing notion that there was a need to reconfigure the global locomotive IB project once again. One proposal was to morph the major thrust of the GLF project into three integrated regional IBs—one for China, one for Russia/CIS, and one for India—each being responsible for driving growth by developing its market for an integrated package of GE locomotives, signals, services, etc. It was an intriguing idea, but would mark the third iteration of this IB in its young 15 month life, and some were concerned that it may seem like project churning.

The Hybrid Engine Dilemma: To Be or Not to Be?

At the same December IB Review, the Transportation business was also scheduled to present its latest plans regarding the Hybrid Locomotive IB. As the whole management team understood, almost three years earlier the Hybrid had captured Immelt's attention as a perfect candidate to fit into the company's just announced Ecomagination program committed to environmentally responsive innovation. Indeed, it had been the CEO's suggestion to elevate the research on the Hybrid engine and to give it IB status. As he had publicly stated, the Hybrid Loco represented "the right solution for the customer, for the market, for the environment, and for GE."

The plans for the Hybrid locomotive were centered on a diesel-electric engine that would capture the energy generated during braking and store it in a series of sophisticated batteries. That stored energy could then be used by the crew on demand—reducing fuel consumption by as much as 15 percent and emissions by as much as 50 percent compared to most of the freight locomotives in use at the time.[8] But as the concept was translated into a product, it became clear that the battery technology at the core of its design was not yet able to support the proposed customer benefits or to achieve them at a cost that would make the project economical. As a result, almost three years into the program, many were expressing doubts about whether the Hybrid IB would be able to meet any of its original stated objectives—to add value to the customer, to provide returns to GE, and to allow access to new markets.

At Transportation's monthly Growth Council to prepare for the December IB presentation, Dineen, BeGole, Tucker, and Comte explored the options. On the one hand, with all the opportunities available in other product line extensions and geographic expansions, the team was very aware of the opportunity cost of the Hybrid project. At least in the short term, it would be a resource sink and did not appear to be the most effective use of its management time, organizational energy, and limited financial and technical resources.

On the other hand however, there was a recognition that the long-term trend away from fossil fuels and towards alternative energy meant that eventually GE would have to develop a hybrid locomotive. Knowing their CEO's commitment to the Hybrid project, the team debated whether they had done enough to understand if customer value could be created in different segments, explore alternative technological solutions, or analyze how costs could be reduced. But to do so, they realized, would mean withdrawing resources from other sources of growth that seemed more immediately promising.

As Comte summarized the discussions, he posed three alternative scenarios that could be presented in December's IB Review:

- The first option would be to explain that while the project as currently defined appeared to have very limited to short to medium term commercial viability, the business would commit to exploring alternative ways to make it successful, albeit with a reduced allocation of resources and an extended date for commercialization.

- The second approach would be to acknowledge the hybrid's long-term potential, but suggest that it be placed on hold as an IB, transferring primary responsibility to the Corporate Research Center to develop the battery technology in collaboration with the various GE businesses—including Transportation—that had an interest in its development.

- The final alternative would be to recommend that the company acknowledge the fact that after three years of work on this project, neither the technology development nor the market acceptance of the hybrid locomotive had indicated that it could be a viable commercial proposition in the foreseeable future, and therefore that the Hybrid IB be scrapped.

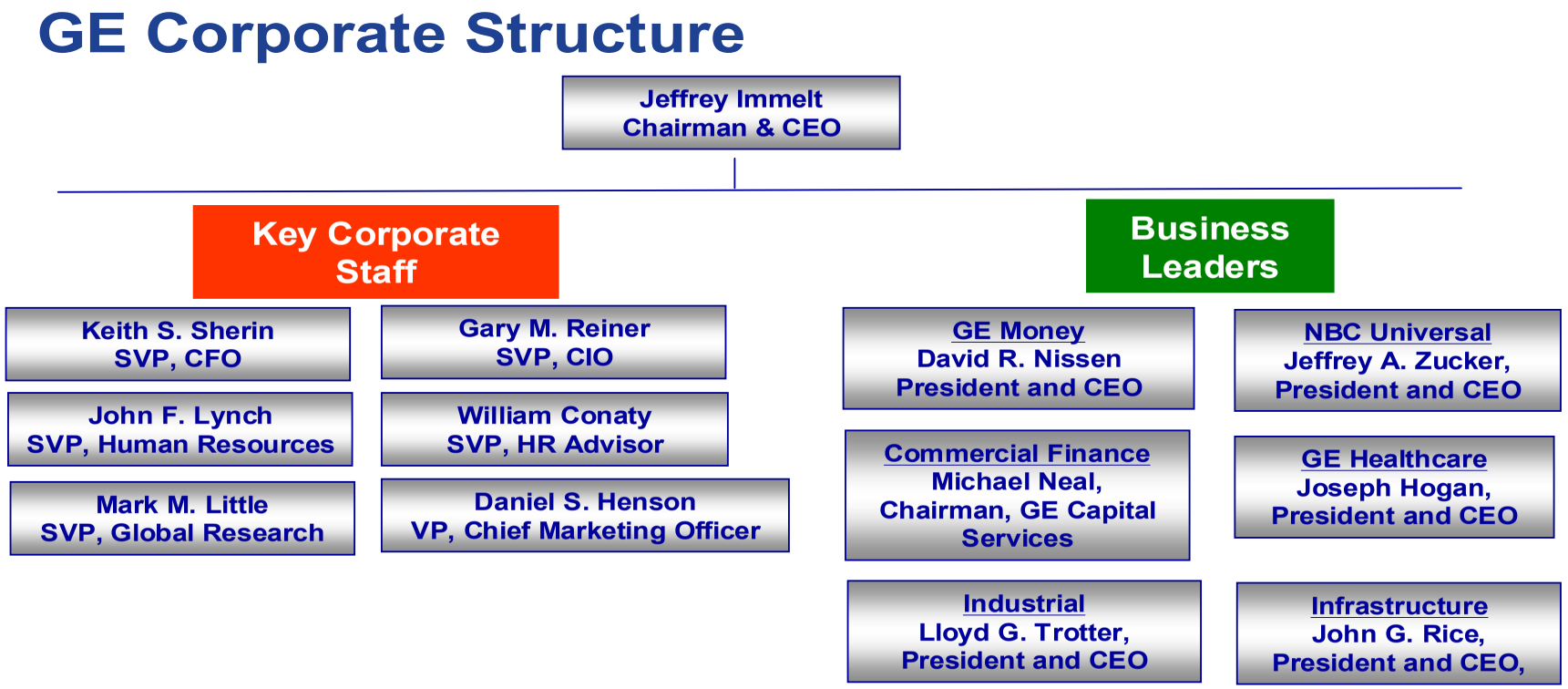
As they talked through these options, the management team not only wrestled with what was in the best interest of the business, but what Jeff Immelt was likely to believe was in the best interests of the company. With 83 IBs now approved in GE, and 35 already launched and generating more than $2 billion in additional revenues, the process of generating organic growth was clearly well-established. But that did not mean that the CEO was becoming less involved. He personally tracked every IB, and focused even more intently on those that had caught his attention—like the Hybrid Loco. As Transportation's management team realized, deciding its future was going to be a tough, but important decision.

Exhibit 1 GE Financial Performance, 1992–2006 ($ millions)

	2006	2005	2004	2003	2002	2001	2000	1995
General Electric Company & Consolidated Affiliates								
Revenues	163,391	147,956	134,291	113,421	132,226	125,913	129,853	70,028
Earnings from continuing operations	20,666	18,631	16,601	15,589	15,133	14,128	12,735	6,573
Loss from discontinued operations	163	(1,922)	559	2,057	(616)	(444)	0	
Net earnings	20,829	16,711	17,160	14,091	14,629	13,684	12,735	6,573
Dividends declared	10,675	9,647	8,594	7,759	7,266	6,555	5,647	2,838
Earned on average shareowner's equity	19.5%	17.8%	17.9%	20%	25.2%	27.1%	27.5%	23.5%
Per share:								
Net earnings	1.99	1.76	1.59	1.4	1.46	1.41	3.87	3.90
Net earnings—diluted	1.99	1.76	1.59	1.4	1.52	1.37	3.81	
Dividends declared	1.03	0.91	0.82	0.77	0.73	0.66	1.71	1.69
Stock price range	38.49-32.06	37.34-32.67	37.75-28.88	32.43-21.30	41.84-21.40	52.90–28.25	60.5-41.66	73.13-49.88
Total assets of continuing operations	697,239	673,321	750,617	647,834	575,018	495,023	437,006	228,035
Long-term borrowings	260,804	212,281	207,871	170,309	138,570	79,806	82,132	51,027
Shares outstanding--average (in thousands)	103,59,320	10,569,805	10,399,629	10,018,587	9,947,113	9,932,245	3,299,037	1,683,812
Employees at year-end								
United States	155,000	161,000	165,000	155,000	161,000	158,000	168,000	150,000
Other countries	165,000	155,000	142,000	150,000	154,000	152,000	145,000	72,000
Total employees	319,000	316,000	307,000	305,000	315,000	310,000	313,000	222,000

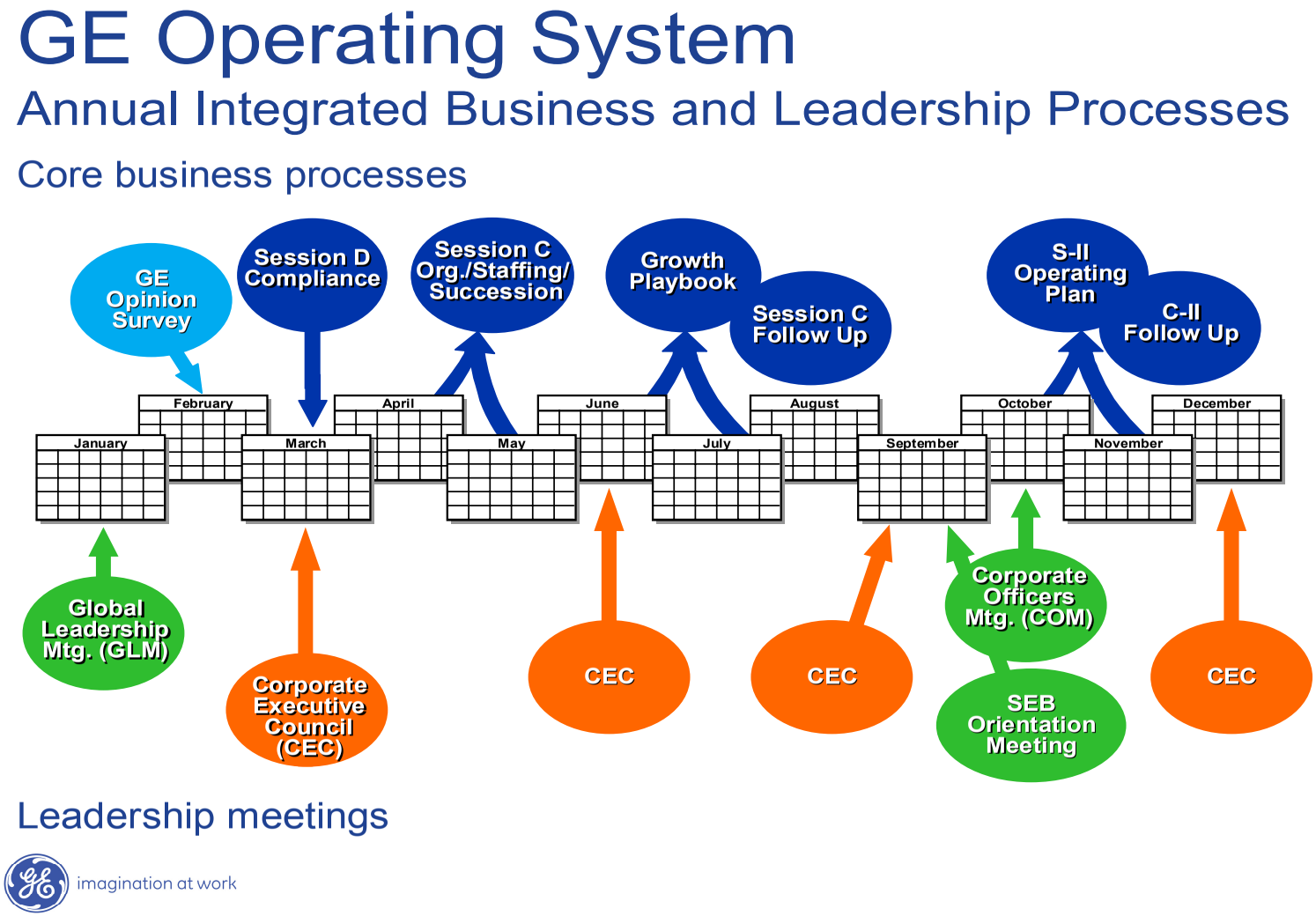
Source: GE annual reports, various years
[a] Price adjusted for stock split in 2000

Exhibit 2 GE Corporate Structure



Source: GE Annual Report, pp. 114–115.

Exhibit 3 GE's Operating System



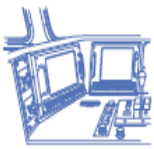
Source: GE internal documents

Exhibit 4 Evolution Locomotive Product Specifications

EVOLUTION SERIES TECHNOLOGY BEARS CLOSE INSPECTION, BY ACCOUNTING AS WELL AS ENGINEERING.

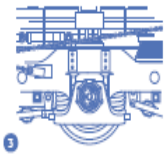
Overcoming obstacles with technological innovation is meaningless if that technology isn't economically viable for everyday use. That's why every component in an Evolution Series locomotive is proven to meet the demands of those who operate them as well as those who pay for them.

Nowhere is this more evident than with the GEVO-12 engine. The heart of the Evolution Series locomotives, the 45-degree, 12-cylinder, 4-stroke, turbocharged GEVO-12 engine produces the same 4,400 HP as its 16-cylinder predecessor. And it does it with greater fuel efficiency, lower emissions, and extended overhaul intervals. Enhanced cooling and higher-strength materials dramatically improve reliability and allow for future increases in power and efficiency.



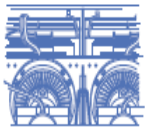
1 **Smart Displays**
Several add-on black boxes are eliminated with a new computer display combination, enhancing both reliability and operator ergonomics.

2 **Enhanced Microprocessor Controls**
Upgraded components and software improve wheel slip/slide control and reliability while providing more comprehensive and simplified diagnostics. Open architecture enables easier integration of software and third-party devices.

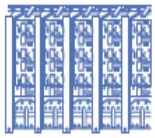


3 **HiAd™ Trucks**
Low weight transfer, an improved microprocessor wheel slip/slide system, and a single inverter per motor, combine to optimize adhesion under all rail conditions. Design simplicity and 10-year overhaul intervals significantly reduce maintenance costs.

4 **Low-Slip, High-Performance AC Traction Motors**
Get a full 166,000 lbs. (AC) of continuous tractive effort and up to 198,000 lbs. (AC) starting tractive effort from a 6-axle locomotive. Integral pinion design eliminates slippage, extending pinion life to 2 million miles. Million-mile motor overhaul intervals further reduce maintenance costs.

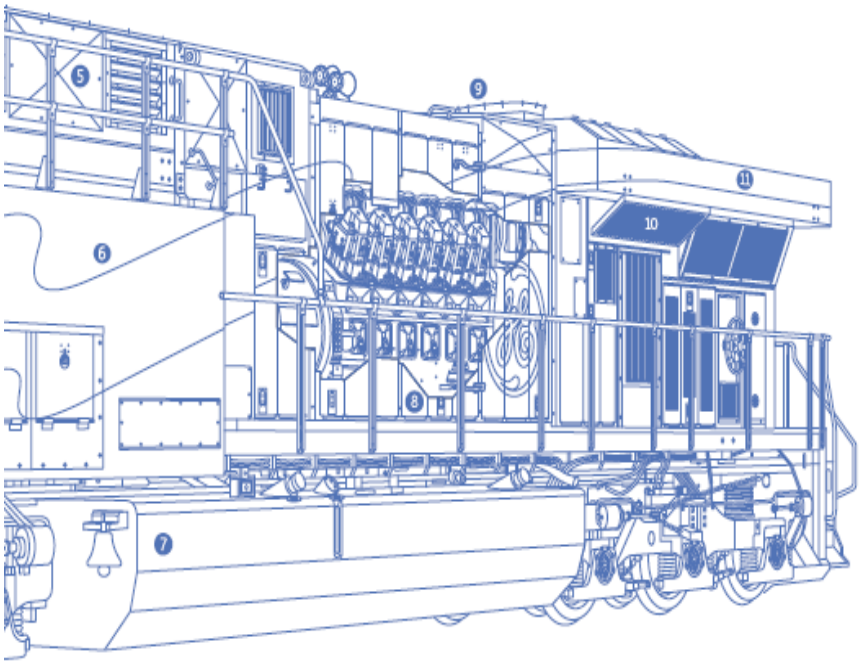


5 **Superior Dynamic Braking**
Evolution Series locomotives feature up to 117,000 lbs. (AC) of braking effort, utilizing the proven grids and blowers from our current production AC 4400 & Dash 9. Braking grids are also completely isolated for greater reliability and simplified maintenance.



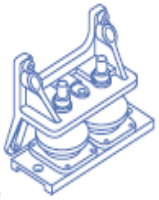
6 **Air-Cooled Inverters**
No coolant. No environmental concerns. A single air-cooled inverter per traction motor provides individual axle control that improves wheel slip/slide, increases mission reliability, maximizes tractive effort, and improves transmission efficiency.

Source: Evolution Locomotive Brochure, GE Transportation website: http://www.getransportation.com/na/en/evolution.html



7

High-Impact Fuel Tank
This tank exceeds AAR S-5506 with thickened, reinforced walls and baffles for even greater puncture resistance.



8

Isolation Mounts
Smoother. Quieter. New isolation mounts on the engine and alternator significantly improve operator environment with reduced cab noise and vibration.

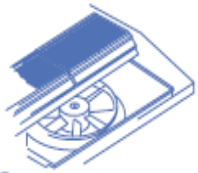
EPA United States Environmental Protection Agency

9

Emissions
"Environmentally compatible" is more than a buzzword for Evolution Series locomotives. Advanced electronic fuel injection, air-to-air cooling, adaptive controls, and GEVO-12 engine technology combine to reduce emissions by over 40 percent.

10

Air-To-Air Intercooler
Manifold Air Temperature (MAT) is greatly reduced with the new hybrid cooling system and air-to-air intercooler. The lower MAT enables emissions compliance while simultaneously improving fuel efficiency.



11

Split Cooling
The proven Split Cooling radiator system reduces engine-air-inlet temperatures and cools the engine oil for increased reliability and longer engine-bearing life.

Exhibit 5 IB Review Preparation: Sample Questions

The following are a few of the questions given to I.B. teams to help them prepare them for reviews:

Market Opportunity

- Can you start with the answer: Where would you like to be and why?
- How does this fit in your strategy?
- What does it take to be good at this?
- How does technology play a role here? Does it give us an advantage?

Competition

- Is anyone else doing this? Who is best at this?
- How we placed vis-à-vis the competition?
- How many others have tried this? Have they succeeded or failed?
- Do our competitors make money at this?

Pricing

- How much would we make on this product?
- How much would the customer pay for this product?
- How do we price it correctly?
- Why aren't we charging a higher price?

Resources

- Where do we have in-house expertise?
- Are you working with any other GE business on this?
- How do we use GE Financial Services as a weapon?
- What resources do we need to hit the growth target? A doubling/tripling of resources?

Go to Market

- What is standing in our way in order to execute this well?
- Is there a way to tap into global suppliers to fill the global pipeline?
- What is the value proposition? How would you differentiate?
- How will you build capability?

Source: GE internal documents

Exhibit 6 CECOR Tool Kit

CECOR Framework

Identifying questions to ask and tools to apply

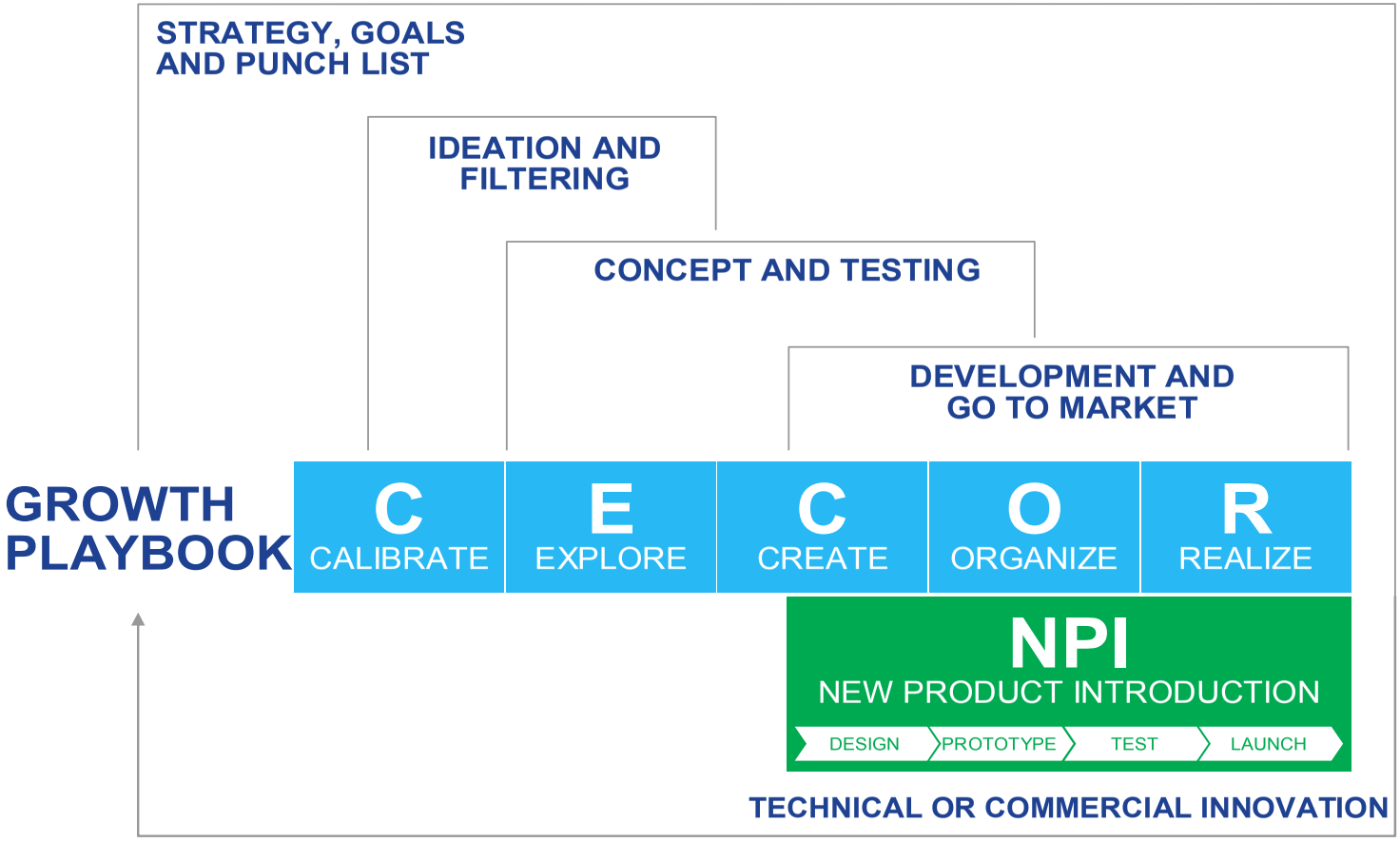
C CALIBRATE	E EXPLORE	C CREATE	O ORGANIZE	R REALIZE
▸ What industry are you in? ▸ Who are the customers and what do they need?	▸ What are our potential avenues of growth? ▸ Which ones will you target?	▸ What are our best ideas? ▸ What is the customer value?	▸ Is the go-to-market plan aligned with the value proposition? ▸ Are you prepared to implement?	▸ Will you meet your revenue and income plans? ▸ How will you measure customer and GE impact?
Tools				
•Five Forces •Market Maps •Profit Pools •Value Chain	•Customer Experience Grid •Segmentation •Competitive Assessment •Targeting	•Capability Assessment • Ideation Sessions • Positioning	•Conjoint Analysis •Value Proposition •Value Based Pricing •Branding	•Go-to-Market Plan •Continuous Feedback (VoC) •Impact Metrics

imagination at work

1

Source: GE internal documents

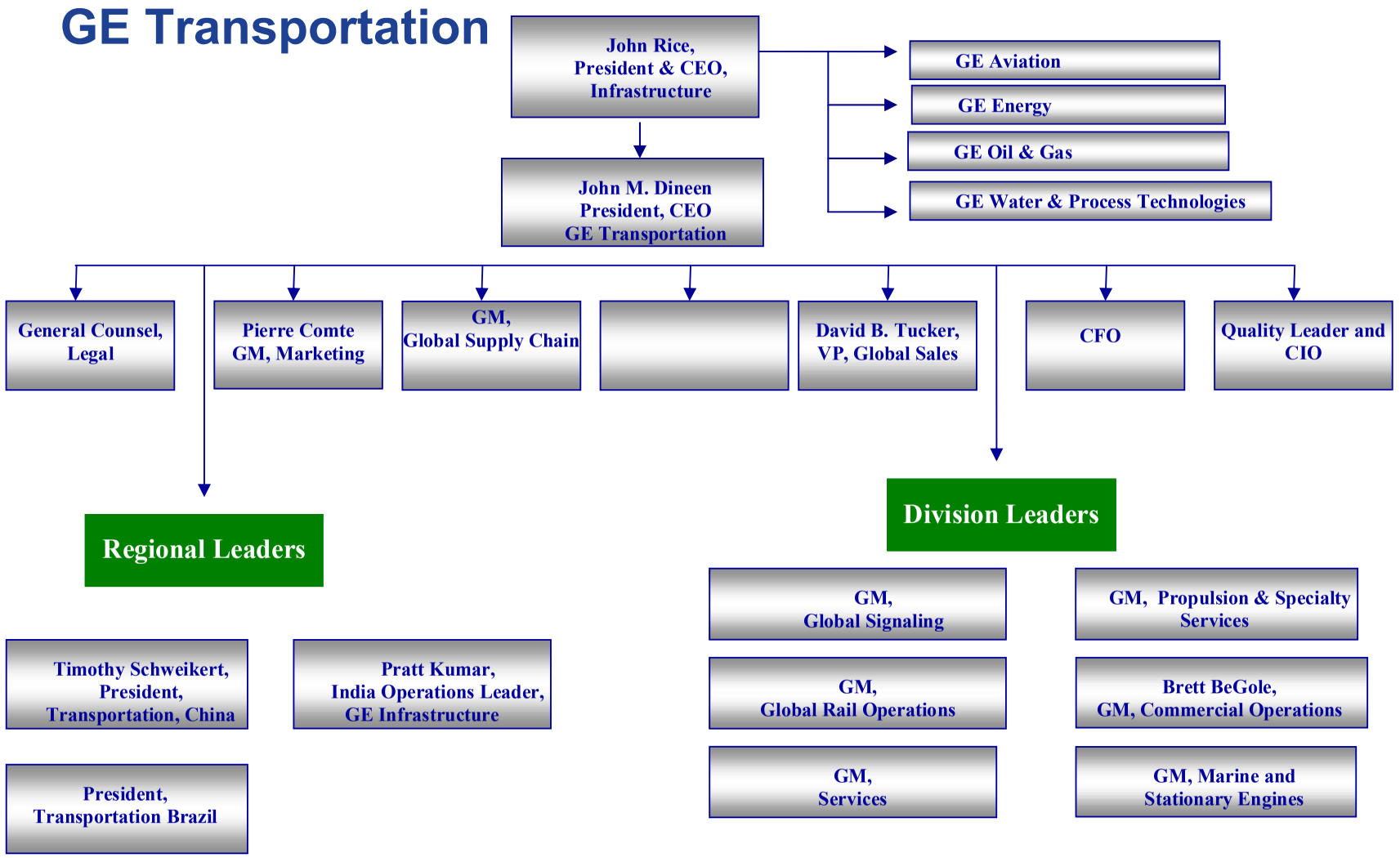
CECOR's fit in GE's operating rigor



imagination at work

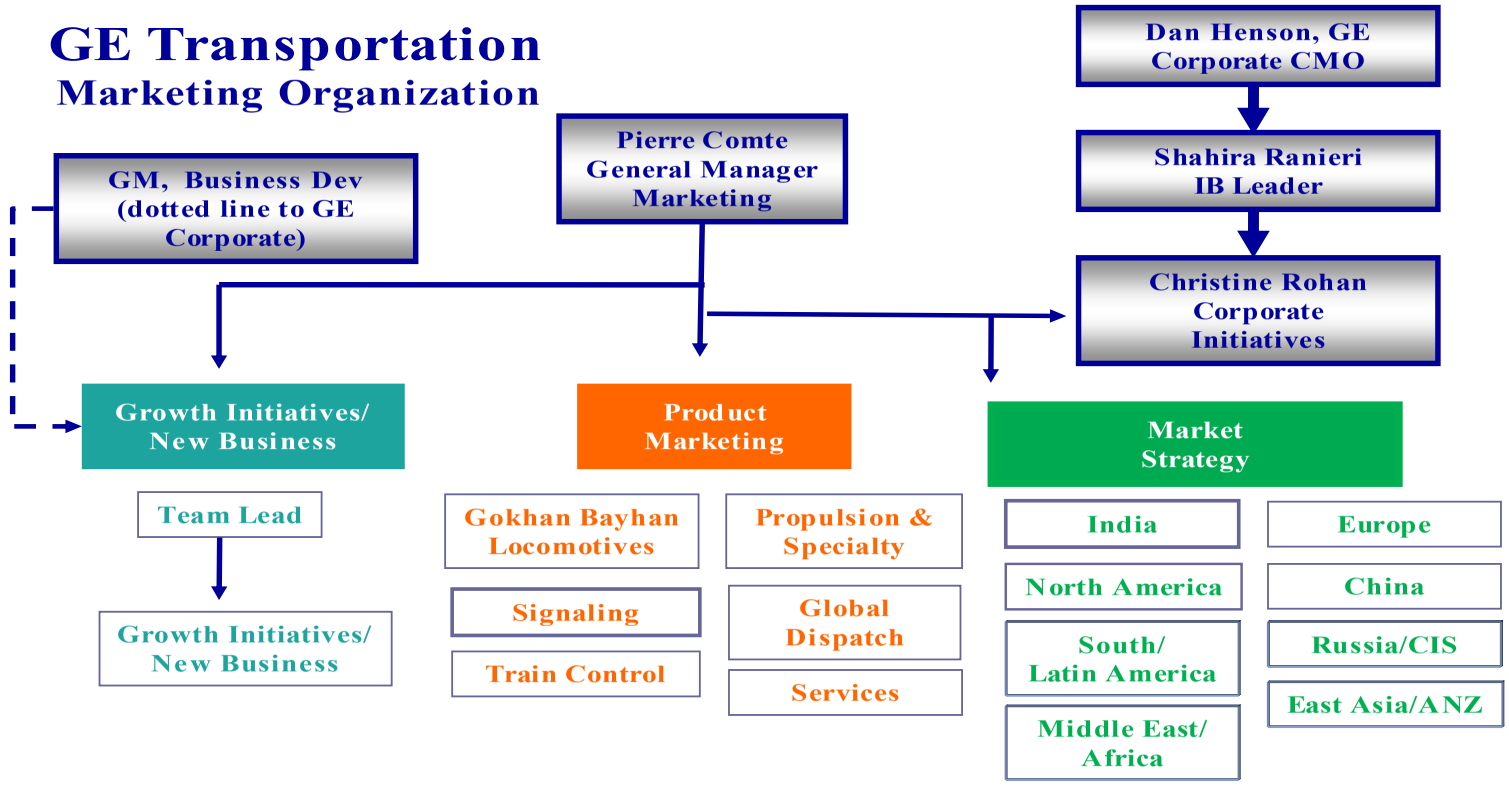
Source: GE internal documents

Exhibit 7 GE Transportation Organizational Chart



Source: GE internal documents

Exhibit 8 Comte's Marketing Organization



Source: Based on GE internal documents

Endnotes

[1] GE 2002 Annual Report, p. 5.

[2] GE 2003 Annual Report, p. 9.

[3] Robert Buderi, GE Finds Its Inner Edison, Technology Review, October, 2003, pp. 46–50.

[4] Jeffrey R. Immelt, "Growth As a Process," *Harvard Business Review*, June 2006, p. 64.

[5] Erick Schonfeld, " GE Sees the Light.," *Business 2.0*, July 2004, Vol. 5, Iss. 6, pp. 80–86.

[6] "US loco market still a two-horse race." *Railway Gazette International*, July 1, 2006.

[7] Jeffrey R. Immelt, "Growth As a Process," *Harvard Business Review*, June 2006, p. 64.

[8] From GE press documents. Ecomagination: The Hybrid Locomotive. www.ge.com