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**PRODUCTION
GETS LEANER,
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GREENER**



**ROCKWELL
AUTOMATION
GIVES FACTORIES
A GREATER EDGE**



**WORKPLACE
INITIATIVES FOR
HIRING PEOPLE
WITH DISABILITIES**



nyse

MAGAZINE

A PUBLICATION OF NYSE EURONEXT

» GM's New Model

*With CEO Dan Akerson rewriting the rules,
the iconic automaker returns to profitability*

**A look inside the world's biggest machine:
CERN's Large Hadron Collider**

**From calling cards to oil shale, how
CEO Howard Jonas is expanding IDT Corp.**

**"Say on pay" rules drive the need to
boost shareholder communication**

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LESLIE SHIERS ASSOCIATE EDITOR
SYNDI BECKER DESIGN DIRECTOR
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SARA CAHILL COPY CHIEF
JANE MAYERS SENIOR MANAGER, PRE-MEDIA OPERATIONS
BONNIE SACHINIS SENIOR OPERATIONS MANAGER

ADVERTISING

PAUL KOSTIAL GLOBAL MEDIA SALES DIRECTOR
 paul@audienceinnovation.com, 888.241.6634 x719
WALKER MASON EAST COAST SALES MANAGER
 walker@audienceinnovation.com, 888.241.6634 x734
GAIL EARLY SOUTHEAST SALES MANAGER
 gail@audienceinnovation.com, 888.241.6634 x769
CHERYL SOLOMON MIDWEST & TEXAS SALES MANAGER
 cheryl@audienceinnovation.com, 888.241.6634 x766
JOE PUCKETT WEST COAST SALES MANAGER
 joe@audienceinnovation.com, 888.241.6634 x760

CONSULTANT TO NYSE EURONEXT

JEANNE COTRONEO DARROW



PUBLISHING

CHRIS W. SCHRIFT PRESIDENT
GEORGE J. BAER III EXECUTIVE DIRECTOR 248.988.7896
CYNTHIA MANALO ACCOUNT DIRECTOR 212.522.9752
HANS HELMERS GENERAL MANAGER

EDITORIAL

JOHN GODFREY VICE PRESIDENT, CREATIVE
GORDON BASS VICE PRESIDENT, EDITORIAL

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WOW.

THIS ISSUE OF NYSE MAGAZINE takes us on the manufacturing industry's transformational journey as smarter processes and greener practices deliver greater efficiency and transparency. Start with our cover story on GM, which has created a lean manufacturing model flexible enough to respond to global consumer demand and bring to life innovations such as the electric-powered Chevy Volt, which CEO Dan Akerson calls a game changer (see page 12).

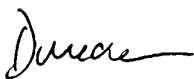
But one of the biggest challenges the industry faces is finding talent. Despite the fact that the U.S. auto industry is once again adding to the labor force, it is seeking a much more technical skill set. As you'll read on page 28, Rockwell Automation is one company working hard to develop future talent by encouraging students to acquire skills in math, science and technology.

In fact, employment is key to a sustainable recovery in the broader global economy. Without access to capital, businesses will not be able to create jobs and grow. The National Venture Capital Association found that 92 percent of job growth occurs after a company goes public. Even in a down economy, entrepreneurial companies that have managed to go public in the past three years are thriving. Examples include Rosetta Stone, whose employee base has grown more than 50 percent (700 new jobs) since its 2009 IPO; Rackspace Hosting, which has expanded by more than 31 percent (816 new jobs) since its 2008 IPO; and Vitamin Shoppe, which has added 389 associates and 52 stores since its 2009 IPO.

Creating an atmosphere in which entrepreneurs can access capital to expand their companies ought to be the touchstone of public policy. We should look at ways of encouraging capital formation, including an examination of tax policies that affect the cost of capital. We should also reduce the burdens of going public and follow the Chinese example by creating financial incentives for companies that do. By offering tax credits up to \$300,000 for each IPO, Congress could make a meaningful impact in offsetting the cost of going public, particularly for smaller companies. For more on our job creation efforts, turn to The Advocate column on page 44.

These are exciting times for NYSE Euronext. Not only are we evolving beyond traditional equities into derivatives and technology solutions, but earlier this year we announced our intention to combine our business with Deutsche Börse. I am extremely excited about this historic opportunity to bring together two of the world's most respected and successful exchange operators to lead the way in international capital markets. This potential expansion will allow us to do even more with you and all of our partners. We look forward to continuing on this global journey with you.

Sincerely,




ON THE JOB Niederauer keeps the employment conversation going with (left) Sen. Debbie Stabenow (D-Mich.) and Kay Jorgensen, CEO of KSJ Enterprises LLC, who were among the leaders and policymakers at the jobs summit NYSE Euronext held on Capitol Hill in March.

"EMPLOYMENT IS KEY TO A SUSTAINABLE RECOVERY IN THE BROADER GLOBAL ECONOMY."

DUNCAN'S TOP FIVE

MARKET TREND The outlook for IPOs in 2011 is positive, and we are proud that NYSE Euronext ranked first in the world in the first quarter of 2011.

PEER TO PEER It is time for short-term U.S. stimulus measures to give way to policies that promote and sustain strong economic growth over the long haul.

NYSE EURONEXT INITIATIVE In March we launched interest-rate futures on NYSE Liffe U.S. and our joint venture New York Portfolio Clearing, which together provide a new "one pot" margin solution.

RECENT TRIP To Davos, Switzerland, for the World Economic Forum, where my team and I spent 72 hours and spoke with 200 to 300 customers and influencers.

MEMORABLE QUOTE "We knew we would change the lives of people with disabilities when we started hiring at our Anderson, S.C., distribution center. Just as importantly, it's changed lives of people without disabilities." — Randy Lewis, Walgreens' SVP of supply chain and logistics (See page 32.)

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS Certain articles about NYSE Euronext in this magazine may contain forward-looking statements, including forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Such forward-looking statements include, but are not limited to, statements concerning NYSE Euronext's plans, objectives, expectations and intentions and other statements that are not historical or current facts. Forward-looking statements are based on NYSE Euronext's current expectations and involve risks and uncertainties that could cause ac-

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2010 Annual Report on Form 10-K and other periodic reports filed with the U.S. Securities and Exchange Commission or the French Autorité des Marchés Financiers. In addition, these statements are based on a number of assumptions that are subject to change. Accordingly, actual results may be materially higher or lower than those projected. The inclusion of such projections herein should not be regarded as a representation by NYSE Euronext that the projections will prove to be correct. Articles in this magazine speak only as of April 1, 2011. NYSE Euronext disclaims any duty to update the information herein.

upfront

A Better Aim for Targeted Marketing

Company: Alliance Data Systems, a Dallas-based provider of data-driven customer loyalty programs and targeted marketing initiatives

Market Cap: \$4.4 billion

Armed with vast information about consumer purchasing habits, companies can now microscopically slice their markets, targeting customers with the precision of a military strike by leveraging **ALLIANCE DATA SYSTEMS CORP.**'s (ADS) sophisticated technology to reach very specific audiences. Leading the charge is Alliance Data President and CEO Ed Heffernan. Within a decade, he posits, "general mass marketing will be a small share of the market. Ninety percent will be digital." (The latter currently makes up less than 10 percent.)

The stakes are enormous: Marketing spend is shifting from traditional mass marketing to data-enabled, multichannel direct marketing — a \$300 billion market that Alliance Data is seizing upon. However, better technology risks turning off consumers; no shopper wants to feel stalked via her smartphone. Alliance avoids this pitfall by asking permission. "Everything we do is

opt-in," Heffernan explains. "If you're not giving us permission, you don't want to hear from us."

Alliance provides all of its clients — a list that includes companies such as **KRAFT FOODS INC.** (KFT) and **VISA INC.** (V) — with hard numbers to ensure that they're getting the most from their marketing spends. "For every campaign, there's a control group," Heffernan says. "The ROI on the digital campaigns is multiple times what's available with mass marketing." — *Brian Dawson*

90 Percent

THE AMOUNT OF MASS MARKETING THAT ALLIANCE DATA SYSTEMS PREDICTS WILL BE DELIVERED DIGITALLY IN 10 YEARS



Two-Bladed Solution

Company: China Ming Yang Wind Power, China's largest non-state-owned wind-turbine manufacturer

Market Cap: \$1.3 billion

Most wind turbines have three blades. But **CHINA MING YANG WIND POWER GROUP LTD.**'s (MY) new super-compact drive turbine, or SCD, has only two. By making the turbine lighter, "its structure can be simpler, with fewer components," says Chief Technology Officer Renjing Cao, PhD, noting that it also decreases the cost of energy output.

Alliance Data hits the mark with its opt-in digital marketing campaigns.

Ming Yang says it seized an opportunity two years ago to develop a cost-effective turbine for wind farms on- and potentially offshore, which resulted in the SCD. Operating at a power capacity of 2.5 to 3.0 megawatts, the first prototype is now harnessing the breeze above the city of Rudong, just north of Shanghai on the East China Sea.

The SCD weighs about 30 percent less than traditional three-blade models, says Ming Yang. In addition, Cao notes, it uses a water cooling system, so the turbine is not exposed to the corrosion typically experienced by traditional models. — *Adam Risman*

New Twist on Labels

Company: Avery Dennison, a Pasadena-based manufacturer of adhesives, office products and household goods

Market Cap: \$4.5 billion

In a crowded market, consumer products have to scream for attention. Amping up the volume is **AVERY DENNISON CORP.**'s (AVY) Curve Appeal™ system, a labeling film and application technology introduced last fall that allows package designers to employ more complex, intriguing shapes. In the past, the company says, brands were limited primarily to cylindrical and oval containers, which ensured that product labels wouldn't wrinkle



or fall off. Now manufacturers get more available area for product image and information because the labels will adhere to more varied shapes.

This new technology is the result of extensive market research the company started in 2008 to determine what consumer brands needed to do to make their products more visually compelling. The result, says Dean Scarborough, chairman, president and CEO, "is a perfect example of how we help our business partners' products stand out in ways that move consumers to choose them."

Curve Appeal is the latest in a long line of sticky breakthroughs for Avery Dennison, which celebrated its 75th year in 2010: It also developed the first self-adhesive label and the now ubiquitous self-adhesive U.S. postage stamp. — *Chris Warren*

**30
Percent**

THE AMOUNT
OF EXTRA
LABELING SPACE
BRANDS GET BY
USING AVERY
DENNISON'S
CURVE APPEAL
SYSTEM



Financial Education

Company: First Commonwealth Financial, a financial services and banking company based in Indiana, Pa.

Market Cap: \$716.6 million

Even before the economic collapse, John Dolan knew that the average American could use a Finance 101 refresher. Upon becoming CEO of **FIRST COMMONWEALTH FINANCIAL CORP.** (FCF) in 2007, Dolan began developing a free financial literacy program that would both enhance employees' expertise and help the bank's customers achieve personal financial health. "The recent financial crisis in America and the struggles it created for many people may have been prevented if everyone had just stuck to the basics and exercised good financial principles," Dolan says, noting that personal budgeting and credit and debt management now form the core of the First Commonwealth Financial Education curriculum.

Since the program's launch in the fall of 2009, more than one-third of the company's employees have voluntarily enrolled, earning the title of Financial Champion upon completion. And the Champions are encouraged to share their knowledge with the community. In 2010, First Commonwealth employees offered programs such as Town Savers, which offered 145 financial ed classes to 3,000 Pennsylvania high school and college students.

The Institute for Financial Literacy honored First Commonwealth with a Company of the Year award this past fall, but Dolan says it's not about the accolades: "We did this to be better corporate citizens. We want to win by delivering locally as a responsible community bank." — *Adam Risman*



- In 1901 this company became the first to offer recipes in women's magazines.
- This company purchased the 141-square-mile Hawaiian island of Lanai in 1922.
- Worldwide this company owns 131,000 acres of farmland.
- Last year the company implemented a new packing process that reduces water use by more than 80 percent.

ALL CLUES PROVIDED BY THE COMPANY. SEE ANSWER AT NYSEMAGAZINE.COM/CORPORATEID.

Brussels' BEL 20 Index Marks Two Decades

The Index: The BEL 20 comprises the 20 most liquid Belgian companies listed on NYSE Euronext Brussels.

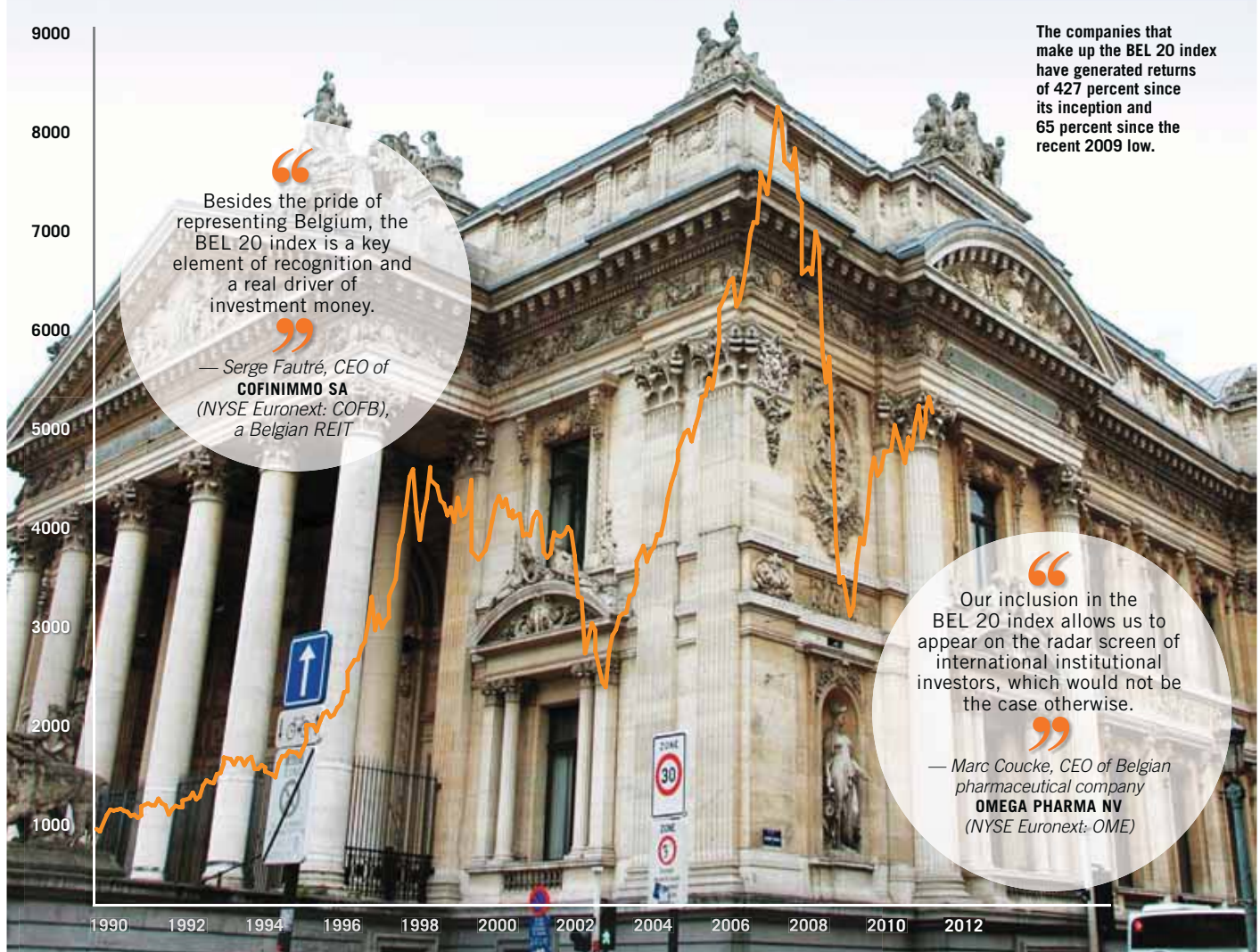
This past March, the BEL 20 index — the benchmark stock index of NYSE Euronext Brussels — marked its 20th anniversary, a moment celebrated both by the 20 companies that currently make up the index and by investors from inside Belgium and around the world.

“The BEL 20 has rapidly taken the place of a real benchmark for the Brussels market,” says Vincent Van Dessel,

chairman and CEO of NYSE Euronext Brussels. “It has perfectly fulfilled its original purpose of serving as a tradable reference combining the representation and simplicity to hedge the entire market.”

Considered the blue-chip index of NYSE Euronext Brussels, the BEL 20 boasts constituents that include such marquee companies as the brewer **ANHEUSER-BUSCH INBEV NV** (NYSE

Euronext: ABI) and the telecom firm **THE BELGACOM GROUP** (NYSE Euronext: BELG). In addition, “many young Belgian companies crystallize their international growth ambitions in joining the BEL 20 index,” says Marc Coucke, CEO of the Belgian pharmaceutical company **OMEGA PHARMA NV** (NYSE Euronext: OME), which joined the index almost nine years ago. “The BEL 20 acts as an inspiring objective.” — *Chris Warren*



Stronger Links for the Supply Chain

Company: Owens & Minor, a Richmond-based distributor of medical and surgical products and provider of supply-chain management systems

Market Cap: \$2.1 billion

While health care can be bewilderingly complex for consumers, it can also be a logistical tangle for the manufacturers and suppliers of medical supplies, devices and pharmaceuticals that seek to get their products from warehouse to bedside as efficiently as possible.

For decades, **OWENS & MINOR INC.** (OMI) has specialized in distribution management for its customers, which now reportedly number 4,400 health-care providers nationwide, as well as 1,400 suppliers. Last May the company debuted OM HealthCare Logistics, a service that offers end-to-end supply-chain outsourcing for manufacturers and suppliers seeking alternative solutions. “With the growing complexity of the supply chain today, we knew we could offer a streamlined outsourcing operation to suppliers and manufacturers,” says Craig Smith, Owens & Minor’s president and CEO.

Readying OM HCL for launch, says Smith, was a two-year effort that entailed outfitting logistics centers, bringing in outside specialists to help build the service, and investing in technology. “What we offer the market is a soup-to-nuts third-party logistics solution on a fee-for-service basis,” Smith notes. Customers can count on the program for sample oversight, product tracking, shipment-discrepancy maintenance and, crucially, recall management — ultimately, Smith explains, a cost-effective system for margin-squeezed suppliers. — *Brian Dawson*



French Connections

Company: Interxion Holding, a Netherlands-based provider of data centers and other information technology services throughout Europe

Market Cap: \$843.6 million

France Telecom’s Minitel service let millions of users shop, check stock prices and make travel reservations online — back in the 1980s. Yet today France lags behind other nations with a fragmented, primitive Internet-exchange industry, says Franck Simon, managing director of France-IX, the

country’s largest Internet exchange, which has six data centers in Paris routing Web traffic between networks.

INTERXION HOLDING NV (INXN) says it has hosted France-IX since its launch last September, and according to CMO Kevin Dean, it has begun attracting other large Web exchanges. Today, Dean says, it is carrying “more than 70 percent of French Internet traffic — more than 100 gigabytes per second.”

Such volume will at last enable “peering,” the efficient exchange of traffic between Internet service providers. Peering “will encourage other carriers and ISPs to become members,” Dean says. “More members means more traffic, more economies of scale and increased interest in the country’s ISP infrastructure.” By providing a secure, carrier-neutral home for ISP collaboration, Interxion says, it aims to recapture companies currently using data hubs outside Paris. — *John McLaughlin*

52

THE NUMBER OF DISTRIBUTION AND SERVICE CENTERS THROUGH WHICH OWENS & MINOR DELIVERS SUPPLIES TO 4,400 HEALTH-CARE PROVIDERS NATIONWIDE



Two Pills in One

Company: USANA Health Sciences, a Salt Lake City-based manufacturer of diet, energy, weight-management and personal-care supplements

Market Cap: \$568.7 million

A manufacturing method new to the vitamin supplements industry could trim consumers’ daily pile of pills. **USANA HEALTH SCIENCES INC.** (USNA) is reducing the load by applying its Nutritional Hybrid Technology, a process previously reserved for the pharmaceutical industry. Using a European-designed press, it combines two supplements into a single pill. Now *that’s* much easier to swallow. — *Adam Risman*

A PERFECT BLEND
USANA is careful with combinations, says VP of Operations Jim Brown. “You wouldn’t want to force two different things on people who weren’t planning on taking them together before.”

{GRAPE SEED EXTRACT}

{VITAMIN C}

Pharmaceutical technology allows USANA to pack two supplements into one Proflavanol C¹⁰⁰ tablet.

TIMING FOR CHAMPIONS

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NYSE EURONEXT
CEO REPORT
{RESULTS}

GLOBAL TRADE WATCH

Q: How is the global trade environment affecting your strategy for 2011 and beyond?



MICHAEL A. GOOCH

CHAIRMAN AND CEO, GFI GROUP INC. (GFIG)

THE COMPANY provides wholesale brokerage, electronic execution and trading support products to more than 2,400 institutional clients.

MARKET CAP \$622.2 million

“WE EXPECT TO SEE continued economic and international trade recovery this year and beyond. As a result, GFI anticipates growth in all of its businesses — especially in Europe and Asia. We continue to invest full bore in technology for the financial and derivatives markets, where we look forward to a strong recovery in trading volumes, with an emphasis on transparency and efficiency. Consequently, we foresee improved performance in 2011 and beyond, particularly as global institutions come to grips with the new regulatory landscape.”



GERARDO DE NICOLÁS GUTIÉRREZ

CEO, HOMEX DEVELOPMENT CORP. (HXM)

THE COMPANY develops, constructs and sells affordable entry-level, middle-income and tourism housing in Mexico.

MARKET CAP \$1.6 billion

“DEVELOPING COUNTRIES benefit the most from global trade expansion. Their economic growth results in greater attention to basic needs, such as housing, and heightened activity in mortgage financing — both of which are favorable to Homex. We are identifying logical opportunities to replicate our business model beyond Mexico. Our goal is to become a world-class developer of quality and affordable homes for lower-income families in underserved housing markets under a conservative, global expansion policy.”



MICHAEL J. LONG

CHAIRMAN, PRESIDENT AND CEO, ARROW ELECTRONICS INC. (ARW)

THE COMPANY distributes electronic components and computer products to more than 115,000 customers worldwide.

MARKET CAP \$4.7 billion

“WE MANAGE OUR BUSINESS to deal with the world's changing economic realities. Arrow Electronics' strategies focus on growth, operational excellence and creating opportunities for employees, customers, suppliers and investors. We believe a healthier economy will be aided by a global trade environment that is not burdened by excessive regulations or an increased emphasis on 'protectionism.' Over the long term, this should provide a way to accelerate economic growth, lower unemployment and reduce deficits faced by governments around the globe.”



DREW NIV

CEO, FXCM INC. (FXCM)

THE COMPANY services accounts from more than 180 countries, specializing in online retail currency trading and executing more than 6.7 million trades per month.

MARKET CAP \$238.3 million

“CURRENCY TRADING is a global market by nature, which is why FXCM has set up offices around the world to service accounts in nearly any country. The market's entire premise is based on one country's strengths versus another's, tying in economic and financial data from all corners. The growth of the global trade environment will only enhance the retail currency trading environment.”

Q Do you believe the global trade environment is having a positive effect on business?

29%

yes

2010

16%

yes

2009

ON THE
WEB

» To read responses from the CEO of **BRF BRASIL FOODS SA** (BRFS) and president of **IBIO INC.** (IBIO), visit nysemagazine.com/globaltrade.

» View more results of the sixth annual NYSE Euronext CEO Report at nysemagazine.com/ceoreport.

All market caps as of April 1, 2011



BIO FACTS

AGE 54

CAREER HISTORY Jonas founded IDT in 1990, served as CEO from 1991 to 2001 and then returned as CEO in 2009.

EDUCATION BA in economics from Harvard University

PREVIOUS AFFILIATIONS Before founding IDT, he started the Jonas Media Group. He also founded the VoIP pioneer Net2Phone Inc. in 1995.

AUTHOR OF *I'm Not the Boss, I Just Work Here* (2004) and *On a Roll* (1998)

To learn how Jonas hones in on emerging business opportunities, visit nysemagazine.com/idtheideas. **ON THE WEB**

SMOOTH OPERATOR

Howard Jonas connects the wires between telecom and energy without putting investors' interests on hold.

BY JOHN R. QUAIN

HOWARD JONAS HAS a deliberate way of speaking that belies a keen insight into new business opportunities. In the 1990s, as founder, chairman and CEO of **IDT CORP. (IDT)**, he ensured that his company's calling card business undercut traditional long-distance fees, changing the telecom business forever. Among the first to see the importance of Voice over Internet Protocol, Jonas founded Net2Phone Inc., a precursor of today's digital-calling services.

As Jonas tested early retirement, however, IDT lost its luster. In October 2009 the Bronx native and father of nine returned as CEO. Since then he has steered the company to four consecutive quarters of revenue growth, with a reported \$15.6 million in net income for the first quarter of fiscal 2011 — a 19 percent bump over the same period in the previous year. Jonas believes he can continue this trend through not only telecom (which represented \$1.4 billion in revenues in 2010) but also IDT's Genie Energy division, which is involved in oil shale extraction projects.

IDT didn't escape the recession's effects. How did you turn the situation around?

I used to think that the main purpose of a business was to serve the employees — if they were happy, they'd make things that would make customers happy. Today you have to make the investors happy. Then the business runs well and you're able to satisfy the employees. Customers and employees are still very important, but I own a third of the company and had to adopt an investor's point of view. We still love to develop new technology and explore new businesses, but we're concentrating more on the business side now. The truth is, in a way, the downturn saved us. When you have to lay off 70 percent of the workforce, the other 30 percent really clicks.

What's in the future for telecom?

We have interests in WiMAX technology, a version of Wi-Fi designed for mobile devices.

And we own most of the wireless backhaul frequencies in the States because of our Winstar Communications Inc. acquisition in 2001. There's enough bandwidth now, but we think the copper networks will fill up. As 4G service grows, you have to put antennas in new places to handle the increased activity, including places without fiber-optic cable. Then they'll have to use wireless backhaul like WiMAX to support 4G.

Videoconferencing is also definitely the future, but I think people still feel a little invaded by it. Already, anybody in the world can place a video call, but the people who do so make up less than 1 percent of all calls.

Is IDT's calling card business threatened at all by Twitter and other types of Internet-based communication?

That part of the business has been growing as the number of mobile devices and phones has

grown. The volumes are up; we do 25 billion minutes a year. We also believe mobile money is coming — that is, paying bills overseas using mobile phones. So we're interested in making it easier to move money from, say, England to Argentina. It appeals to the immigrant population, and we think there will be a continued movement of people from the third world to the developed world. It's about providing all the different services to them.

Others are focused on solar, wind or geothermal energy. Why are you focused on oil shale?

It's obvious that the world's oil is running out. But we're going to be using fossil fuels long after my grandchildren are gone, and 11 trillion barrels of carbon alternatives are out there. So it didn't take any great brains to decide to go into shale. With **TOTAL SA (TOT)**, an international oil and gas company based in France, we have a very important experimental joint venture going on in Colorado, called American Shale Oil LLC. By the end of 2011, we may succeed in bringing up oil from below the aquifer to ease environmental concerns. It involves extracting partially refined oil without destroying the landscape. Experts say they've modeled this hundreds of times, and it'll be fantastic if it works. It is piloting a new technology, but shale extraction has worked at shallower depths, so I believe we will overcome the environmental concerns. ■



BY SHERIDAN PRASSO

POWER SHIFT

*Bigger profits, better vehicles and
a watershed IPO: CEO Dan Akerson
navigates GM's make-or-break turnaround.*

PHOTOGRAPH BY JOE PUGLIESE



GM CEO Dan Akerson in front of the 2011 Chevy Cruze 2LT and LTZ models at the company's Detroit headquarters



he office of **GENERAL MOTORS CO.**'s (GM) new CEO, Dan Akerson, is startlingly tidy. No piles of papers, no crammed bookcases, just a few die-cast model cars lined up on display shelves and a suit rack in a corner with a dark blazer draped over it. • Akerson is in his shirtsleeves in a new-looking armchair he admits to having barely used, talking animatedly about the new GM — about a makeover designed to ultimately leave the company as orderly as this office. For decades, of course, auto executives have occupied space in the glass-towered Renaissance Center overlooking downtown Detroit, but it is Akerson, a 62-year-old former U.S. Navy officer, boxer and private-equity specialist, who has been handed the mandate for the company's renewal.

Before GM's 2009 bankruptcy, the company was saddled with a history that tied the hands of Akerson's predecessors. Union contracts had guaranteed high wages and benefits and secure jobs, which had led to runaway costs as well as overproduction that forced dealers to discount heavily to sell vehicles. Billions were diverted into poorly considered acquisitions, says Akerson. Debt spiraled. GM had failed to sufficiently prepare for an era when high gasoline prices made consumers seek out small, fuel-efficient vehicles instead of the SUVs and large sedans that Detroit had focused on producing during its boom years. In 2008, when gasoline rose to more than \$4 a gallon and a credit crunch left consumers unable to get loans, GM's sales fell precipitously with the market, compelling the company to file for bankruptcy protection and pursue a government bailout.

But these days, Akerson, who took over as CEO in September 2010 and in addition

became chairman at the beginning of this year, says he is focused on putting things right. "Our risk profile today is much less risky than it was before," he says, playing out his role as the cost controller that Wall Street and the government want to see turn this company around. "If you look at where we are today, as painful as it was, we had to get our costs down. The pain and embarrassment of bankruptcy allowed this company to come out of that with a relatively clean balance sheet."

GM reported a profit of \$4.7 billion on \$135.6 billion in revenue for 2010, the company's first profitable year since 2004 and largest since 1999. Its retail sales of passenger cars were up 76 percent in February over those of a year earlier — with new vehicles such as the plug-in hybrid Volt making a strong debut, the Cruze compact selling better than expected and Cadillac up 60 percent over the first two months of last year, the company reports. New vehicles featuring the

latest technology are a key part of the turn-around strategy, as is a new relationship with labor and with dealers nationwide, Akerson says. The sale of Saab, coupled with the elimination of Hummer, Pontiac and Saturn, concentrates manufacturing on just four makes — Buick, Cadillac, Chevrolet and GMC — cutting capacity and streamlining the manufacturing and supply chains in the name of global cost efficiencies, he explains. All this, Akerson says, puts the company on a new track toward profitability and ultimately an exit ramp from government ownership.

"The IPO was a turning point," he says of the November 2010 common and preferred stock issuance, which raised \$23 billion and lowered the U.S. government's ownership stake to about one-third from two-thirds. "It reintroduced GM to the American public." When it was going into bankruptcy, Akerson says, only 16 percent of Americans had a positive view of GM; now 65 percent do.

REAR VIEW

MORE THAN A CENTURY OF
AUTOMOTIVE MILESTONES

1908

GM is founded

1909

GM acquires Cadillac,
GMC and Pontiac



1927 ▲

The Cadillac LaSalle
revolutionizes car design

1931

GM becomes the leader in global
auto sales, a title it would hold
for 77 years

1942

All GM production is converted to
the Allied war effort

1948

GM introduces the U.S.'s first
high-compression V8 engine



1953 ▲

The Chevrolet Corvette
is unveiled

1971

GM designs the mobility system
for the Lunar Rover, the first
vehicle driven on the moon ▼



(continued) →



GM CEO Dan Akerson
(right) with Terry Turrentine,
an employee at the
company's transmission
facility in Toledo

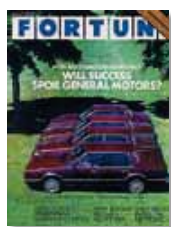


Diana Tremblay, GM's
global chief manufacturing
officer (left), and Akerson
visit staff members at GM's
Detroit-Hamtramck plant.

***“GM has accomplished one of the
most dramatic industrial transformations
in American business history.”***

— WILLIAM J. HOLSTEIN, AUTHOR OF *WHY GM MATTERS*

REAR VIEW (CONTINUED)



1983 ▲

The August 22 issue of *Fortune* features GM on the cover

1996

GM's EV1 sets a new benchmark for modern-day electric vehicles ▼



2000

Oldsmobile phaseout begins

2003

1,000-horsepower Cadillac Sixteen concept car is unveiled ▼



2008

Gas reaches \$4 a gallon

2009

GM declares bankruptcy

2010

GM returns to the NYSE in November, concurrent with its IPO ▼



The electric hybrid Chevy Volt debuts November 30

GM records a profit of \$4.7 billion, its first since 2004

"What GM has accomplished is one of the most dramatic industrial transformations in American business history," says William J. Holstein, author of *Why GM Matters: Inside the Race to Transform an American Icon*. "It wasn't a straight path at all, and in fact it was messy. But it got done. The company dramatically improved the way it makes cars; it recaptured design leadership from the Japanese; it streamlined its brand structure from eight to four makes; and it transformed its labor cost structure."

Hot Sellers, New Models

Even though bankruptcy set back the pace of product launches, many of the new cars in the new GM's lineup are now selling well — not just compared with year-ago sales figures but compared with reported sales figures for competing models, the company says. In the first two months after the Volt went on sale in December, for example, GM sold a reported 650 of the plug-in hybrids, while 106 Nissan Leafs were sold in the same period. "We're selling everything we're making," says Mark

Reuss, GM's president for North America and a former vice president of engineering.

Furthermore, GM reports that first-quarter retail sales for the Chevrolet Cruze, which initially launched last September, are up 203 percent from first-quarter 2010 retail sales of the Cobalt, the car it replaced in Chevrolet's lineup — and the company sees its addition of the Cruze Eco in February as just a beginning. "We've got some pretty exciting stuff happening," Reuss says. "I love cool cars, but cool cars get you only so far. You have to perform from a safety standpoint, from a reliability standpoint, and focus has to be on the cost."

Some of GM's biggest hopes are pinned on the Buick Verano, the brand's first small sedan in decades, which goes on sale in the fall. It's the car that Akerson is most excited about. Picking up a Verano brochure from his coffee table, he can't help admiring it. "Look at that!" he says. "That is a great-looking car. Doesn't that look like a car you'd want to buy?"

The Verano is a compact luxury sedan aimed at luring buyers who would never have

THE VOLT: A "GAME CHANGER"

CHEVY'S NEW ELECTRIC VEHICLE IS WINNING CUSTOMERS — AND CREATING JOBS.

In the auto world, few things are more exciting than an electric engine, from the seamless acceleration to the knowledge that lithium ions are changing the industry.

GM is capitalizing on that excitement with the \$41,000 Chevy Volt, which went on sale last December, outselling the Nissan Leaf by huge margins and winning the prestigious North American Car of the Year award. "This is a game changer," says CEO Dan Akerson, who wants GM to build even more than the 45,000 vehicles currently planned for 2012. In addition to meeting U.S. demand, GM plans to export the Volt to China and, later this year, to Europe as both the Volt and the Opel Ampera, with changes to front-end styling.

Already, GM says, it is selling as many Volts as it can produce. U.S. Secretary of Labor Hilda L. Solis, who toured the Detroit-Hamtramck plant in early February, was clearly excited. "It's great to see plant managers, workers and their unions coming together to share ownership of the Volt," Solis said during her visit. "It wasn't too long ago that people were saying, 'Let's write off the auto industry.' Now, because of the Volt and other autos, what we're starting to see are all positive signs that the industry is coming back."

“Cool cars get you only so far. You have to perform from a safety and reliability standpoint, and focus has to be on the cost.”

— MARK REUSS, GM'S PRESIDENT FOR NORTH AMERICA

considered a Buick before. According to GM, the Verano's design puts it in the same league as the Audi A4 or an entry-level Lexus or Infiniti, but its starting price — expected to fall in the low- to mid-\$20,000s range — will make it more affordable than its competitors' cars (which start in the high \$20,000s to low \$30,000s). Design features include premium leather seats, ambient lighting, a black chrome waterfall grille, blue translucent projector-beam headlamps and what GM calls a “library-quiet driving experience.” “We don't want to play at the bottom of the league tables,” Akerson says. “We want to surprise and delight.”

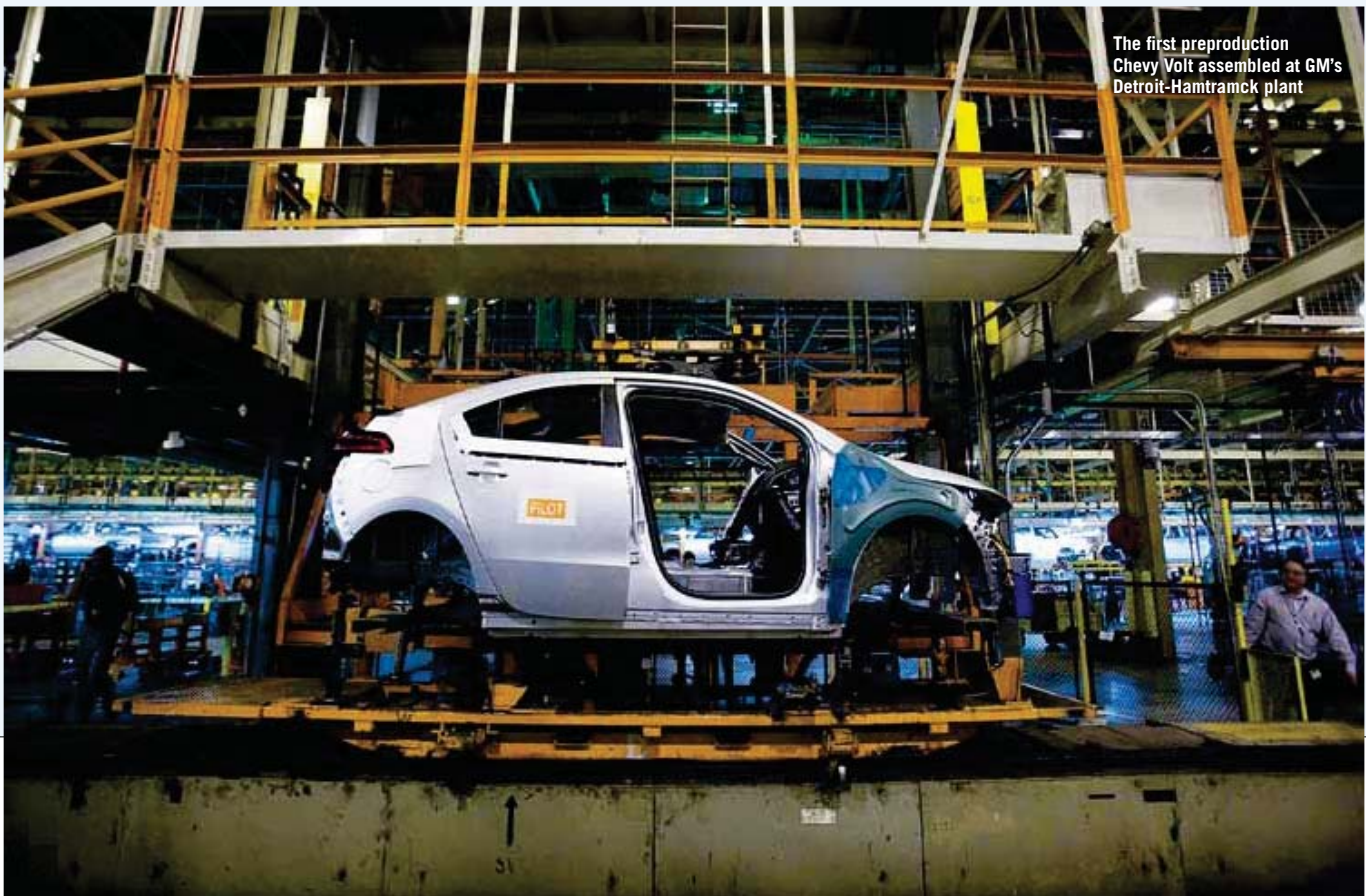
GM has high hopes too for its Chevy Sonic subcompact sedan and hatchback, also in the fall lineup. “We haven't had a good B-class car for my whole career,” observes Reuss, who has spent nearly three decades at GM. Priced under \$20,000, the car replaces the poorly selling Chevy Aveo. “This one is very special for us,” Reuss adds. “We spent an awful lot of time putting the fun back into a car that size.”

Technological Innovation

Electric engines, of course, are the game changers of the moment, and ultimately GM wants to sell electric or electrically assisted

vehicles under every GM brand — adding Buick first and then Cadillac, Akerson says. But, he notes, no promising technology that could replace the internal combustion engine is off-limits for GM's long-term thinking. “Do we have the ability to look over the horizon and see what's coming?” he asks. “Is it electric? Is it hydrogen? Is it CNG [compressed natural gas]?” To that end, GM says it ramped up product development spending to \$7 billion in 2010, from \$6 billion in its year of bankruptcy.

With its Super Bowl ads in early February, GM unveiled its Eco model of the Cruze, which the company says increases highway miles per gallon from 36 to 42 — better than the Honda Civic, Toyota Corolla and Ford Focus with which the car competes. Reuss describes how the Cruze Eco's aeroshutters behind the grille close at high speeds for better aerodynamics, how panels smooth out drag from the bottom of the car, and how tires originally developed for the Volt increase fuel economy by reducing rolling resistance.



The first preproduction Chevy Volt assembled at GM's Detroit-Hamtramck plant

Ultimately, GM says, it will offer Eco options for other cars in the family as well.

GM says that it will also begin rolling out eAssist lithium-ion hybrid technology throughout various models, starting with the 2012 Buick LaCrosse mid-size sedan and the 2012 Buick Regal. The technology improves fuel economy by 25 percent, the company reports. "That's a big, big jump for us," Reuss says. "You'll see eAssist percolate through other cars and crossovers."

Lastly, GM is participating in an initiative to build up to 25 hydrogen car fueling stations in Hawaii as part of a testing program for the vehicles in that state. "The propulsion industry is going to change radically," says Akerson, who wants to ensure GM's preparedness. "It's going to take 20 years, but it's going to change."

Rejuvenated Dealerships

The new GM has a fresh focus on its dealership network as well, as part of its attempt to improve the buying experience for customers. The number of U.S. dealerships dropped from 6,150 before the bankruptcy to 4,500 today, as many were unable to, or decided not to, continue selling GM cars.

"We had a mess on our hands a year ago," Reuss says. "We worked on facility improvements and performance goals, and we worked on getting stock back into dealerships." Before, less than 40 percent of dealers were profitable, he says. Now there is more than 90 percent profitability. "I want our dealers to make a lot of money. I want them to be excited and motivated to sell our cars over other people's."

Today, because of a series of management changes that altered delivery, parts, after-sales service and profitability incentives, dealers "really want to sell Chevrolets," Reuss explains. "That hasn't happened in decades." And that, GM hopes, will translate into brand loyalty and keep customers coming back for GM cars when it's time to buy new ones.

To help achieve its goal of cutting costs, GM says, it has been streamlining production and eliminating excess capacity. In the

BUICK'S BATTERY BOOST

GM'S LIGHT ELECTRIFICATION TECHNOLOGY IS REDEFINING MOTOR EFFICIENCY FOR 2012.



The mid-size sedan market is reaching new levels of efficiency, thanks to GM's eAssist fuel-saving technology, which the company has built into the 2012 Buick LaCrosse and Regal and plans to add to other models in the future. The eAssist cars feature a 2.4-liter, four-cylinder gas engine as well as a 115-volt lithium-ion battery, GM says, and get an estimated fuel economy of 37 mpg on highways.

U.S., GM closed 13 facilities and invested in retooling and upgrades at many of the 34 that remained. The new GM runs at 95 percent of its manufacturing capacity rather than the old 65 percent. "Now a fully utilized plant runs on three shifts," says Diana Tremblay, global chief manufacturing officer. "It's a much more efficient way to run a plant." Parts supply is being harmonized so that, for example, the same fuel pump can be used on the same platforms for cars around the world, improving economies of scale. All of GM's global operations are more fully integrated; for instance, the Chevy Cruze was engineered in Germany and South Korea, launched in China, Korea and then Europe, and introduced to the U.S. market with only minor redesigns.

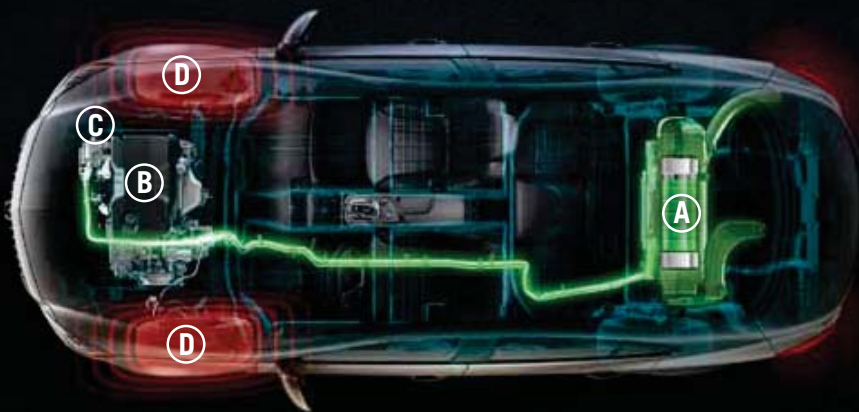
Labor relations have played a big role in reducing costs. An agreement to manufacture the Sonic later this year at GM's Orion Assembly Center in Michigan using "Tier 2" workers who'll make about half the hourly wage of a highly skilled United Auto

Workers, or UAW, union member will allow GM to profitably produce a subcompact car in the U.S. market for the first time in memory. "Everybody recognizes that the business has to be healthy, the business has to survive, the business has to do well," Tremblay says of the new relationship with the UAW. "For the past five to six years, it's been much more of a collaborative, ongoing process."

Joe Ashton, the UAW vice president who handles labor relations with GM and recently toured the automaker's Volt factory with U.S. Secretary of Labor Hilda L. Solis and top GM execs, agrees that labor has done a lot to help. "The UAW has taken a tremendous burden off the Big Three," Ashton says. "That's made a difference to the health of the company. I think it's good for them."

The Road Ahead

Near the door of Akerson's office is a framed cover of an Aug. 22, 1983, issue of *Fortune* magazine (see "Rear View" sidebar). The photo shows a Buick, a Chevrolet, an



INSIDE THE 2012 BUICK LACROSSE

- (A) 115-VOLT LITHIUM-ION BATTERY**
Stores power that gives the car a 15 horsepower electrical boost in certain situations and runs electrical applications while idling, which takes the load off the engine.
- (B) 2.4-LITER ECOTEC ENGINE**
Combined with the lithium-ion battery, this four-cylinder powertrain increases fuel economy by 25 percent.
- (C) ELECTRIC MOTOR-GENERATOR**
Mounted directly to the engine, the generator is liquid-cooled to increase performance and efficiency.
- (D) REGENERATIVE BRAKING**
Converts the vehicle's kinetic energy to up to 15 kilowatts of electricity, which is used to charge the battery.

Oldsmobile and a Pontiac lined up and looking nearly identical. The headline reads, "With Auto Sales Rebounding, Will Success Spoil General Motors?" Akerson points it out as a lesson in complacency.

It's a reminder, too, that despite clearing the hurdles of bankruptcy, with auto sales rebounding, the road ahead for the new GM is long. "We have more work to do on the balance sheet," Akerson says, noting GM still has about \$5 billion in debt and 34 percent government ownership (by the U.S. and Canada, on an undiluted basis). U.S. pension liabilities, down from a \$16.2 billion deficit in 2009, are currently underfunded by \$11.5 billion, the company reports.

Ultimately, analysts want to see a fundamentally stable, profitable GM, with new-product and innovation pipelines, zero debt, zero government ownership and a lean functionality that can take advantage of a changing world — one in which, for example, the market for cars in China is growing far faster than that of the U.S. GM, whose partners

include Shanghai Automotive Industry Corp., currently holds a 12.8 percent market share there, and Akerson wants to increase that stake to 20 percent. GM's China sales rose nearly 29 percent in 2010. To keep up, Akerson will have to continue this momentum. "We're going to keep our heads down and stick to the tasks of managing costs and expanding market share," says Akerson, who understands competitive pressures, having spent 20 years in the telecom business in senior roles with MCI Communications Corp. and Nextel Communications Inc.

before he joined The Carlyle Group, an asset management firm, in 2003. "I think we're going to surprise a lot of people going forward," he adds, exuding excitement about the future. "We'll have new products and more exotic forms of propulsion, including electric and hydrogen fuel cells. The decisions we make today won't manifest for another four to five years."

By then the legacy of GM's latest CEO, Akerson hopes, will be to have freed the company of the burden of its past and placed it on a clear, unobstructed road to the future. ■

IN MY OWN WORDS



**DAN
AKERSON**
CHAIRMAN AND
CEO, GM

- » **The best management advice I ever got is...**people make the company. Build the best team possible and give them rope to run.
- » **The best lesson I bring from my former positions is...**understand the business, conceptualize where you want to be in five years and execute with precision.
- » **I believe when leading people it is important to...**exhibit integrity and lead by example.
- » **A perfect day outside work is spent...**with my family.





Read what the Council on Competitiveness is doing to keep U.S. producers on top at nysemagazine.com/futuremanufacturing.

INDUSTRIAL EVOLUTION

TODAY'S WORLD OF MANUFACTURING IS LEANER, GREENER AND SMARTER THAN EVER. HERE'S HOW SEVERAL COMPANIES ARE BRINGING BRAINS TO THE BRAWN OF THE PRODUCTION LINE.

When a group of CEOs, consultants and policymakers convened at the Detroit Economic Club for a special summit on manufacturing two years ago, a former U.S. Department of Commerce official shared a tale about **TOYOTA MOTOR CORP.** (TM) that resonated with many at the closed-door meeting. A few years back, she said, the automaker was considering spending \$1 billion to locate a factory in the southern U.S. But, she continued, its executives at the time worried that the prevailing perception of manufacturing in America — dumb, dirty and in decline — would limit their ability to hire skilled workers.

That was then, this is now: The reality of smart manufacturing directly contradicts the image of factories spewing pollution from smokestacks, while, inside, workers with little training and education perform repetitive tasks. In fact, rather than being

defined by the “three Ds,” say executives from **ROCKWELL AUTOMATION INC.** (ROK), whose executives attended that meeting, smart manufacturing is becoming even smarter, safer and more sustainable. *(Read more about Rockwell Automation on page 28.)*

In an open letter to industry leaders and policymakers, Rockwell Chief Technology Officer Sujet Chand and Jim Davis, vice provost of information technology at the University of California, Los Angeles, and the principal investigator of a National Science Foundation grant on Smart Process Manufacturing, lay out a broad definition: “Smart manufacturing marries information, technology and human ingenuity to bring about a rapid revolution in the development and application of manufacturing intelligence to every aspect of business. It will fundamentally change how products are invented, manufactured, shipped and sold. »»

BY CHRIS WARREN

PHOTO ILLUSTRATIONS BY NOLA LOPEZ

It will improve worker safety and protect the environment by making zero-emissions, zero-incident manufacturing possible.”

In part, the evolution toward smart manufacturing is a natural reaction to the economic challenges of the recession, says Don Lesem, vice president of design and supply chain at **IHS INC.** (IHS), an information and insight company that focuses on capabilities such as supply chain, energy, defense and sustainability. “If you look at 2008, the rate at which manufacturing just stopped was unbelievable — it was a hard stop,” he says. “Now, as factories are brought back up and capacity back online, companies want to better understand and anticipate the demand and the capacity they need to make available.”

THINKING AHEAD

As president of the industry automation division at Siemens Industry Inc., part of **SIEMENS AG** (SI), Raj Batra aims to help manufacturing companies optimize their entire value chains, from product design and development to production, sales and service. “When I talk smart manufacturing, I’m talking about elements from product design all the way to the manufacturing floor,” he says. In the past, Batra explains, each of these elements was typically handled independently, a scenario he contends led to waste and inefficiency.

Virtualization in product design is one example of how Siemens helps its customers avoid that waste. “It’s a known fact in our environment that 75 percent of manufacturing costs are pre-determined in the product design phase,” Batra says. “Whether it’s less plastic in a bottle or the reduction of the number of parts going into a jet, we are able to model a lot of scenarios. Because we can see complexity in the virtual world before we mechanically put things together, a lot of optimization is possible.”

IHS’ Lesem says that his company assists its clients by giving engineers and R&D staffers up-to-date information on the technical feasibility, price and availability of the components that go into the products they are designing. Design engineers, he



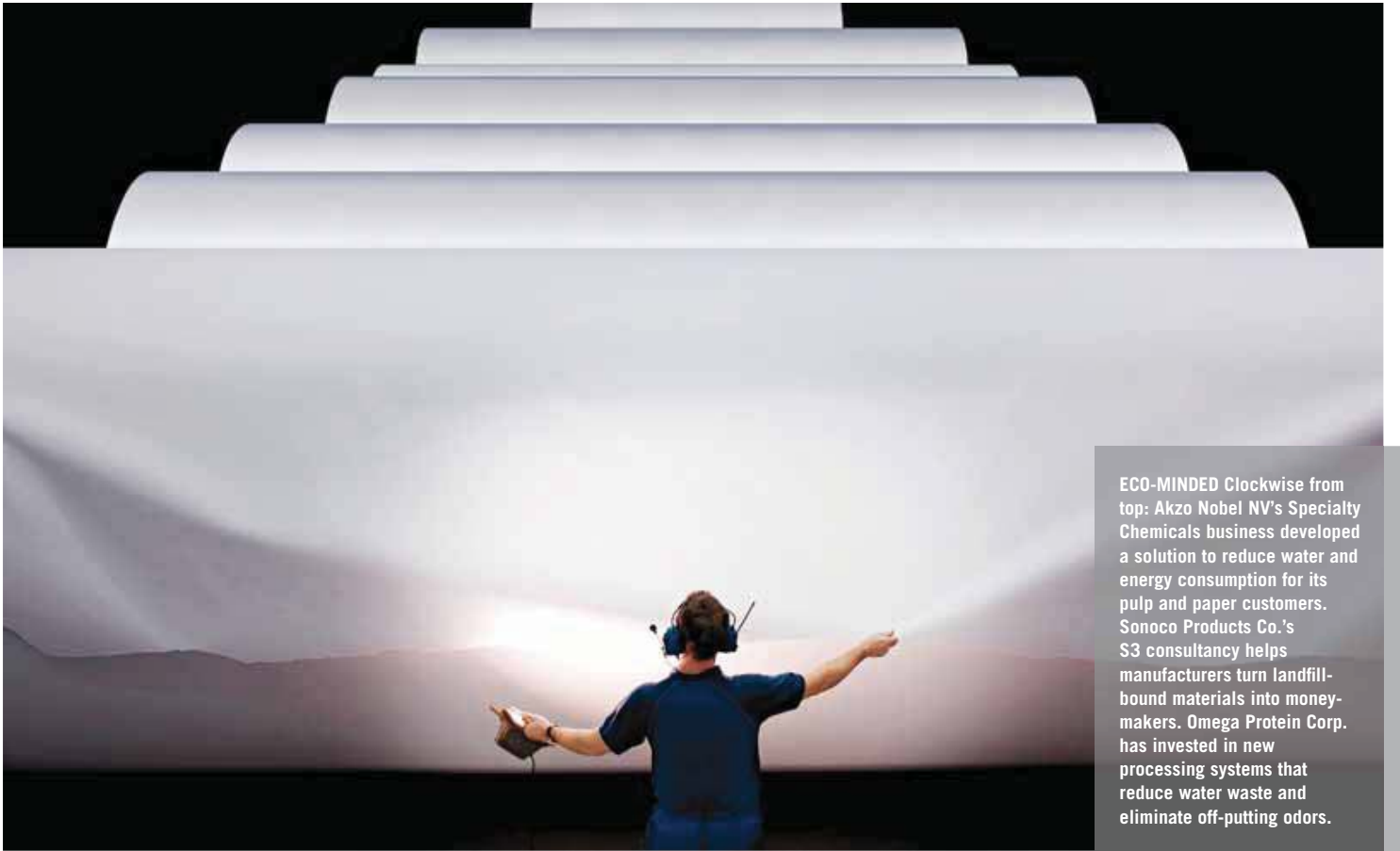
*THE PUSH FOR
SMARTER
MANUFACTURING
MAY, IN PART, BE
A NATURAL
REACTION TO
THE RECESSION.*

says, tend to be focused on the “latest and greatest” technologies, an approach that isn’t always realistic when it comes to procuring and manufacturing the products. Lesem gives the example of working on **MOTOROLA MOBILITY HOLDINGS INC.’s** (MMI) mobile phones. “We want to make sure the components that go into the device screens are available from preferred component suppliers through the life of the product,” he says. Lesem illustrates the importance of incorporating this insight into the manufacturing process by citing the potential nightmare scenario of a company having to take down a factory line and reconfigure it because components are not available or are unreliable. “If you’re unable to ship products, you can imagine that in a fast life-cycle area like electronics that would be catastrophic.”

GENERAL MILLS INC. (GIS) uses product design as just one step of an entire process it calls holistic margin management, or HMM, which the company says is the philosophy it employs in all its decision-making. According to John Church, General Mills’ senior vice president of supply chain, the company decided to redesign one of its signature products, Hamburger Helper, which Church says had become more complex over the years — to the point that it was offered with more than a dozen different noodles. But that complexity, says Church, made sense only inside the company, where employees “lived and breathed” its products. Realizing that the breadth of options didn’t mean as much to consumers, General Mills decided to cut the number of noodle choices from 16 to eight. “That allowed our supplier to have less complexity and allowed us to store less raw material and focus our technology on eight variables as opposed to 16,” Church explains. “Less complexity leads to more advantages in manufacturing.”

TRANSPARENT PROCESSES

As consumers become more conscientious about where their products come from, supply-chain visibility becomes increasingly important. This is especially true for food companies, as the quality and safety of their ingredients is vital, says Rockwell’s Chand.



ECO-MINDED Clockwise from top: Akzo Nobel NV's Specialty Chemicals business developed a solution to reduce water and energy consumption for its pulp and paper customers. Sonoco Products Co.'s S3 consultancy helps manufacturers turn landfill-bound materials into money-makers. Omega Protein Corp. has invested in new processing systems that reduce water waste and eliminate off-putting odors.

“SMART MANUFACTURING MARRIES INFORMATION, TECHNOLOGY AND HUMAN INGENUITY. IT WILL FUNDAMENTALLY CHANGE HOW PRODUCTS ARE INVENTED, MANUFACTURED, SHIPPED AND SOLD.”

— From a letter to the industry by Rockwell Automation CTO Sujeet Chand and Jim Davis, vice provost of IT at UCLA



STATE OF THE ART Smithfield Foods Inc. (left) and Siemens AG put controllers and automats to work monitoring system processes and boosting productivity.



“EVERYTHING WE DO HAS THE END GOAL OF INCREASING EFFICIENCY AND IMPROVING ENVIRONMENTAL RESPONSIBILITY.”

— Joe von Rosenberg, chairman, president and CEO of Omega Protein Corp.

At **SMITHFIELD FOODS INC.** (SFD), Henry Morris, the company’s senior corporate vice president of operations and engineering, says that technology is deployed throughout the manufacturing process to allow for a complete record of the supply chain. “Smithfield employs computerized systems to provide traceability all the way from farm to fork,” he says. Morris says that Smithfield has incorporated enterprisewide software systems tailored to its needs to include information it requires from suppliers of ingredients, packing materials and other items.

Batra recounts how Siemens recently worked with an automotive supplier that had won a piston contract from a European car company. “The supplier wouldn’t be awarded the order until it had a very clearly documented and verifiable process to track the genealogy of that piston,” he says. “So if there were ever a recall or a situation where something went wrong with that piston, the car company would have a documentable way to understand where the breakdown occurred in the process.” The solution was to use a Siemens Manufacturing Execution System software product called SIMATIC IT, which links processes from

*BEYOND SAFETY,
SUPPLY-CHAIN
VISIBILITY LETS
CONSUMERS VIEW
THE EXACT ORIGINS
OF PRODUCTS
AND MAKE MORE
EDUCATED
PURCHASING
DECISIONS.*

order management to assembly on the factory floor to achieve transparency. The same software is used in the pharmaceutical industry to track the origins of drugs, Batra notes.

LEANER & GREENER

In a small New England town on the banks of the Androscoggin River is a manufacturing facility making big environmental strides. At the end of 2010, **THE PROCTER & GAMBLE CO.** (PG) announced that its facility in Auburn, Maine, which makes Tampax feminine-care products, had become the company’s first in North America — and its ninth globally — to send zero waste to landfills. The Cincinnati-based maker of consumer products such as Pampers diapers and Head & Shoulders shampoo says that the Auburn manufacturing facility is part of an ambitious long-term environmental sustainability vision that includes powering all of its plants with 100 percent renewable energy and using 100 percent renewable or recycled materials for all of its products and packaging.

According to Keith Harrison, Procter & Gamble’s global product supply officer, achieving this goal is

possible when manufacturing waste is disposed of in three ways: recycling, repurposing and turning waste into energy. “These give value to waste, whereas waste that ends up in landfills has no value,” he says. “We want to ensure that more than 99.5 percent of what enters our plants goes out the door as finished product or has some other beneficial end-of-life use by 2020.”

At the Auburn manufacturing facility, Procter & Gamble teamed up with Sonoco Sustainability Solutions LLC, a.k.a. S3, a division of **SONOCO PRODUCTS CO.** (SON), in a three-year effort to ensure that none of the nearly 2,300 tons of waste it generates annually goes into a landfill. Harrison says that all manner of techniques was used by Sonoco and the plant’s employees, who he says are naturally thrifty Mainers. “They donate samples and auction off retired tools and used furniture to employees, and then donate the money to the United Way,” he says. “They partner with Sonoco to recycle more than 60 percent of the plant’s waste, such as cardboard, plastics and mixed paper, and send the remaining 40 percent to a local waste-to-energy incineration facility to generate energy.” That energy, Harrison notes, is then sold to the local power company.

Marty Pignone, Sonoco’s vice president of global manufacturing, says that his company is working with other companies, including **KRAFT FOODS INC.** (KFT) and **UNILEVER PLC** (UL), to achieve the most sustainable factories possible. Pignone says that S3 experts visit each customer’s manufacturing site and identify all of its waste streams — even climbing into Dumpsters when necessary — to figure out where it all should go. Making this effort is both sustainable and economical, he says, because it results in lower disposal fees and more revenue from the sale of recyclable materials and waste converted to energy. “A large consumer-goods plant will typically net several hundred thousand dollars,” he explains. “What some people see as garbage we see as revenue.”

Joe von Rosenberg, the chairman, president and CEO of **OMEGA PROTEIN CORP.** (OME), a manufacturer of fish meal and organic fish solubles and reportedly the world’s largest producer of omega-3 fish oil, says that the company’s sustainability initiatives are a way to both improve its operations and enhance its reputation in the community. “Everything we do has the end goal of



SAVVY COMPANIES
ARE FINDING
WAYS TO RECYCLE
AND REPURPOSE
EXCESS MATERIALS
TO COMPLETELY
ELIMINATE WASTE.

increasing efficiency and improving environmental responsibility,” he says. For the past few years, von Rosenberg says, the company has taken steps to become a cleaner manufacturer, making significant investments in equipment that reduces the amount of water and energy required to convert menhaden fish into end products.

Omega’s most significant recent investment, he says, was its \$10 million acquisition of airless dryers for its manufacturing facility in Virginia, which are used after the fish are caught and pressed and before they’re separated into fish meal and fish oil. “That had far-reaching environmental impact,” von Rosenberg recalls. “Most noticeably, we were able to remove a tall smokestack at our factory that was visible to boaters and neighbors. They were happy to see it removed and pleased with the reduction of the steam and gases that cause the unpleasant odor associated with fish processing.”

INTELLIGENCE REQUIRED

An enduring misperception about manufacturing work is that it is repetitive and mindless, requiring little skill or education. But given today’s high-tech factories, the bar for highly trained, skilled manufacturing workers tightly aligned with design and procurement has been raised, typical in the current competitive market, says IHS’ Lesem. The Heritage Foundation, a Washington, D.C., think tank, released a report last October indicating that although U.S. manufacturing jobs disappeared over the past decade, down to 11.7 million in 2010 from 17.5 million in 1987, the number of employees in manufacturing with advanced degrees increased 44.4 percent between 1992 and 2009.

Sonoco’s Pignone agrees that it takes a lot of education and training to optimally run complex processes. “In a paper mill, there are thousands of process parameters that can be important and should be monitored,” he says. “Things can go wrong and equipment can fail, but by monitoring the processes and data you can react quickly and

SMART MANUFACTURING

fix things.” For example, Pignone says, the quality of recycled paper is very much dependent on the amount of moisture in it, which can be affected by a variety of factors that need skillful monitoring and adjustments. “With the digital control systems and analytical tools we have today, an engineer can quickly and automatically have a computer identify where the process shifted upstream and run correlations and statistical analysis to determine what the source of that moisture variation can be.” That is hardly a rote task, Pignone notes, which is why many workers at Sonoco paper mills are engineers who also get additional on-the-job training in Six Sigma, a quality-assurance program based on statistics developed by Motorola in 1986.

Smithfield’s Morris says that employees throughout his company must be properly trained to use the software and production equipment in its manufacturing facilities. “Even production-line workers often interact with computerized touch screens and electronic equipment that requires specialized skills and training to generate the

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quality and efficiency that these systems are designed to produce,” he says.

One way Morris says his company ensures that employees have the skills they need is by working with universities, community colleges and suppliers to provide training. Morris says Smithfield partnered with Iowa State University to develop the Brown Belt Meat & Poultry Science Training Program, in which employees participate in three weeklong sessions focusing on microbiology, computer formulation and processed-meat technology. “As a final assignment, students must develop a lean manufacturing project to be implemented at their facility,” he says. “Close to 200 employees have been through the program, with the projects they developed generating savings in excess of \$20 million.”

ALWAYS INNOVATING

Regardless of where companies are in the process, a full transformation to smart manufacturing requires continuous innovative thinking. At General Mills, Church admits, the move toward holistic margin management, or HMM — which includes smart manufacturing — was disruptive,

IT’S ALL ABOUT THE CUSTOMER

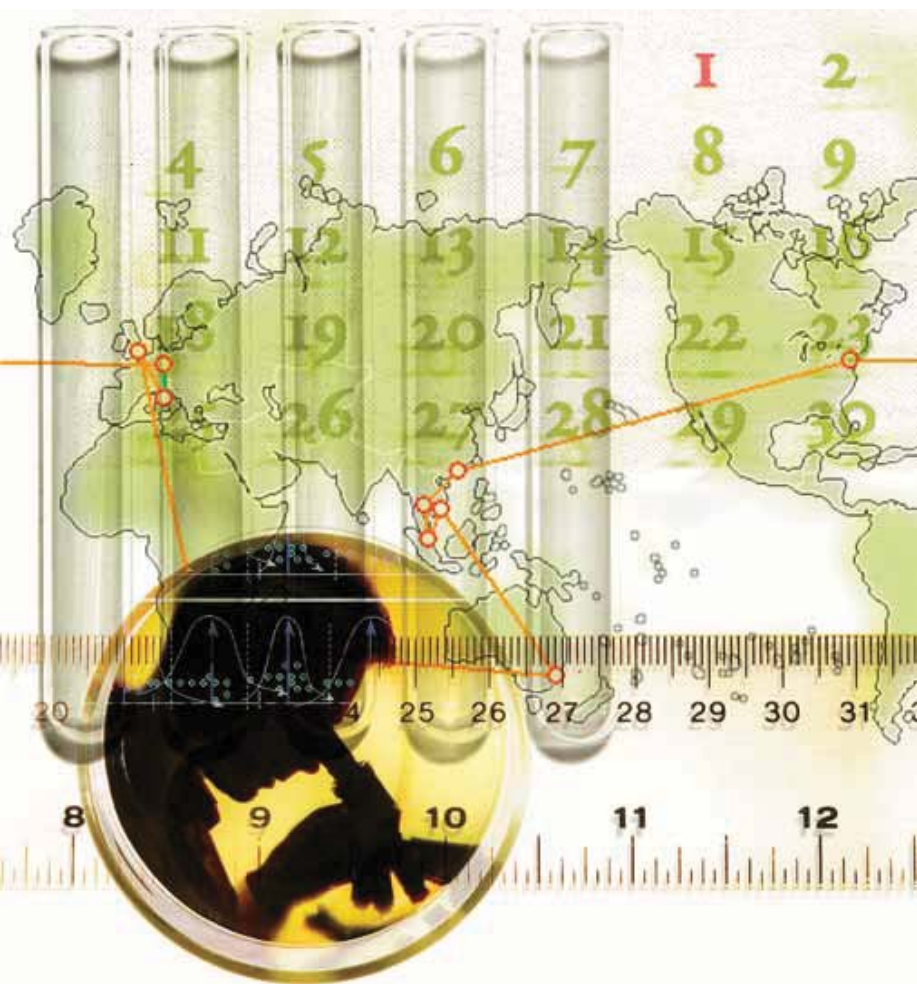
QUALITY CONTROL LEADS TO BETTER PRODUCTS — AND BETTER CONSUMER EXPERIENCES.

The belief that high quality and low cost are mutually exclusive is wrong, says Amy Whiteman, who runs the Operations Leadership Exchange at **THE CORPORATE EXECUTIVE BOARD CO. (EXBD)**, which supplies guidance to business leaders to help them make better decisions. She and her team of researchers have delved into the importance of adopting a Quality Management System, or QMS, which she describes as the business processes and policies around quality management at a company. “The top adopters of QMS,” she says, “have been able to improve cost and quality at the same time.”

How does this apply to manufacturing? Consider the recent spate of recalls due to poor product quality. “That is inextricably linked to your brand, and when your brand takes a hit, so do your financials,” Whiteman says. But getting employees involved with manufacturing to focus on quality

isn’t enough, she says, noting that a QMS has to be systemic for it to mean anything. The QMS is the tool that companies use to manage quality, Whiteman explains, and although 67 percent of employees her team surveyed understand how a QMS helps their companies succeed, only a small percentage believe that a focus on quality will lead to positive outcomes in their jobs. Changing this mindset could translate to a 30 to 40 percent improvement to cost metrics, she adds.

The trick is getting an entire organization to embrace a QMS. Its adoption is driven by such factors as management accountability and employee ownership, Whiteman says, not by a company’s culture. In other words, it’s holistic and requires commitment from senior leaders to implement. As Whiteman notes: “Quality is bigger than just making sure products meet spec, and compliance does not equal adoption.”



requiring the company to change its overall business model. “As a consumer products company, we enjoyed a long run through the ’70s, ’80s and ’90s of steady, reliable input costs,” he says. “We lived in a land of plenty. Our business model was predictable, and we enjoyed a period where our manufacturing organization delivered a 2 to 3 percent productivity increase year over year, which we could then use to offset any inflation.” But during the past decade, he explains, the increasing globalization of the economy, characterized by higher demand driven by developing markets, pushed up input costs by two to three times inflation. Church says this challenge — and the recognition that tweaks to the supply chain would not be sufficient to keep pace with the changing business environment — led General Mills to recalibrate its business model and adopt HMM as its centerpiece, a process that began in 2005. Revamping products like

*MANUFACTURING
COMPANIES MUST
MAKE CONTINUED
INVESTMENTS TO
ADVANCE THEIR
SYSTEMS — OR
RISK BEING
OUTPRODUCED.*

Hamburger Helper, coupled with steps such as locating factories closer to where consumers live to reduce transportation fuel usage, has been a long process, but one that Church says has been financially worthwhile. In fact, in 2010 General Mills announced that it expected its HMM changes to yield savings of \$1 billion through fiscal 2012 and \$4 billion by 2020.

AKZO NOBEL NV (NYSE Euronext: AKZA) says that a commitment to constant product innovation helps it assist manufacturers in their quest to become smarter. Reportedly the largest global paint and coatings company and a major producer of specialty chemicals, AkzoNobel believes it has developed solutions that make one part of the manufacturing process much easier and cheaper for customers — for example, products that reduce or eliminate drying time when cars, planes or boats are painted. Graeme Armstrong, the company’s executive committee member responsible for research, development and innovation, gives the example of AkzoNobel’s work with the makers of a Formula 1 race car. “What we have done with them is create a paint technology that massively increases their efficiency in the painting process for the car, taking it from eight hours to four hours,” he says. “The idea behind it is that time is money.”

Armstrong says that AkzoNobel is also in a trial phase of doing away with wet paint and the drying process that accompanies it for certain cars and trucks. “Instead of liquid, which takes time to dry, we are experimenting with spraying vehicles with a solid polymer powder and then flashing it through the oven after it is painted,” he says. “We want to make smart manufacturing take drying out of the process entirely.”

As companies work to accelerate turnaround, decrease their environmental footprint and keep the innovations coming, expect the world of manufacturing to continue its evolution. Omega Protein’s von Rosenberg, for one, says that his company won’t be cutting back on its manufacturing upgrades anytime soon. “As a publicly traded company, we are mindful that our obligation to make a profit has to factor in somewhere,” he explains. “To make these investments, you have to come up with significant capital. But at the end of the day, you can’t afford *not* to do it.”



CEO Keith Nosbusch shows his company's support of technology education at a FIRST Robotics Competition at Bradley Tech High School in Milwaukee (see sidebar, page 30).

MANUFACTURING INTELLIGENCE

LED BY CEO **KEITH NOSBUSCH**, ROCKWELL AUTOMATION IS
HELPING COMPANIES ACHIEVE A GREATER COMPETITIVE EDGE.

R

OCKWELL AUTOMATION INC. (ROK) Chairman and CEO Keith Nosbusch has seen the future of manufacturing and says that 20th-century muscle is being replaced with 21st-century ingenuity. Consider

TATA MOTORS LTD.'s (TTM) new "smart factory" in the state of Gujarat in India, built for a reported \$417 million. Operating with Rockwell Automation equipment that measures and monitors everything happening in the plant, the factory is turning out the Nano, a car that can be bought for less than \$3,000, which, according to its maker, eventually will be available around the world and will undercut the price of new automobiles sold anywhere.

That the Nano can be built in India for so little has less to do with cheap labor and more to do with smart manufacturing. Factory workers use Rockwell's hardware and software to control every aspect of assembly, from

the color of paint used on the exteriors to the type of audio system installed in each car based on customer preference, explains Sujeet Chand, chief technology officer at Milwaukee-based Rockwell. Information from Rockwell's controllers — clusters of computers and sensors installed on the shop floor — alerts Tata factory managers when a piece of equipment requires maintenance and allows the factory to get parts (seats or components for the heating and cooling systems, for example) from suppliers in real time, when they're needed and in the right quantities based on orders received from Nano dealers.

"The myth about emerging countries is that they use cheap labor with abysmal working standards in terrible plants and abusive environments" to turn out low-price goods," says Nosbusch, 60, who joined the company as an application engineer straight out of college and was promoted to CEO in 2004. "The fact is, often these are high-tech facilities."

BY SUSAN CAMINITI • PHOTOGRAPH BY ERIN PATRICE O'BRIEN

Indeed, Nosbusch observes, smart manufacturing is emerging as the next big competitive advantage — and the U.S. had better start retraining its workforce to catch up. “If we don’t invest in and make constant improvements to our manufacturing sector, America will lose its preeminence in the global economy,” he says.

Today Rockwell Automation is providing the brains that make factories run more efficiently. Its products and services let manufacturers such as **FORD MOTOR CO. (F)**, **KRAFT FOODS INC. (KFT)** and **THE PROCTER & GAMBLE CO. (PG)** control an array of factory-floor functions automatically and simultaneously. Imagine a master control for your house that not only runs the lights, hot water heater, air conditioning and phones but also adjusts them higher, lower, on or off based on how many people are using them and when — *and* alerts you to any mechanical hiccups — and you’ll have a good idea of what Rockwell does for manufacturers.

Rockwell’s roots go back to 1903, when Stanton Allen and Lynde Bradley launched a business to sell their initial product, a motor controller. The privately held company prospered over the next five decades, particularly when American manufacturing took off after World War II. In 1985, Rockwell International — then a huge conglomerate making parts for rockets, airplanes and cars — bought Allen-Bradley for approximately \$1.6 billion. The deal redefined Rockwell’s future: Over the next decade it spun off or sold its aerospace, automotive and other businesses to concentrate on commercial electronics, finally splitting into two companies in 2001, with one named Rockwell Automation.

A NEW ERA

Nosbusch predicts that the way goods are made — be they cars, cookies or detergents — will undergo profound change during the next decade. This transformation toward smart

JUST THE FACTS

HEADQUARTERS
Milwaukee

ANNUAL REVENUE
\$4.86 billion*

MARKET CAP
\$13.8 billion†

EMPLOYEES
19,000

LISTED SINCE
August 29, 1956
(Rockwell International split into two entities in 2001, and Rockwell Automation began trading under the symbol ROK)

*12 months ended Sept. 30, 2010
† Market cap as of April 1, 2011



Rockwell Automation's Logix Control Platform synchronizes and monitors processes in a bottling plant. Read more about the system at nysemagazine.com/roklogix.

SEEKING SKILLED WORKERS

“There’s still this idea that manufacturing is metal-bending and blue-collar work,” says Rockwell CTO Sujeet Chand. To counter that impression and encourage next-generation talent, the company supports FIRST (For Inspiration and Recognition of Science and Technology), a nonprofit that aims to inspire young people’s interest and participation in scientific and technological pursuits.

But businesses and the school system can’t do this alone, says John Heywood, an economist at the University of Wisconsin, Milwaukee. The pipeline needs to be filled with graduates prepared for 21st-century manufacturing jobs, he says. “There are as many computers in plants and factories today as there are in any tech company,” points out Rockwell Chairman and CEO Keith Nosbusch. “How we create this skilled manufacturing workforce is one of the most pressing questions this country faces.”

As a member of the steering committee of the Council on Competitiveness, Nosbusch is working with other industry executives to develop a plan to keep U.S. manufacturing competitive well into the future. The group will present it at a national manufacturing summit in Washington, D.C., in December. For more on the Council on Competitiveness, visit nysemagazine.com/futuremanufacturing.

IF WE DON'T INVEST IN AND MAKE CONSTANT IMPROVEMENTS TO OUR MANUFACTURING SECTOR, AMERICA WILL LOSE ITS PREEMINENCE IN THE GLOBAL ECONOMY. — Keith Nosbusch, chairman and CEO

manufacturing is already taking place: CTO Chand says that by using the company's controllers and software, most of its customers are collecting data from machines on their factory floor and linking them together for greater efficiency. A few customers are in phase two, Chand notes, which he describes as "turning the data into manufacturing intelligence."

For example, the Los Angeles water department — a Rockwell customer for the past three years — is collecting data on water consumption. Working with the city, Rockwell's engineers constructed a computer simulation model to predict water demand at various times of day, during different seasons and under a number of weather conditions. Based on the simulation, Chand explains, the city can now decide how and when to route water from particular reservoirs to meet demand. Ultimately, Rockwell helps the city save money by reducing the energy used for pumping water and allowing it to plan reservoir capacity in advance. All this connectivity, Chand says, will usher in a day when consumers can "tell" a factory exactly what car to build or how they want their jeans cut to fit.

Rockwell is positioning itself to be the linchpin of this manufacturing renaissance. "This isn't just about customers buying our hardware," says Ted Crandall, senior vice president and chief financial officer. "It's our knowledge of their manufacturing processes and our global support capabilities that helps to improve their productivity and sustainability."

This concentration on what's ahead is a nice change, given where Rockwell has been. Since most of its customers are manufacturers, the company is a bellwether for the overall economy. And in the financial crisis of 2008-2009,

that clearly wasn't good news. "After the recession began, we saw an incredible pullback in both capital and operating spending among our customers," Nosbusch admits. "Customers weren't maintaining machines, they were idling lines and deferring planned, preventive maintenance. The attitude was one of survival."

Rockwell felt their pain. By the end of fiscal 2009, revenue was down 24 percent to \$4.33 billion, and profits had plunged by nearly two-thirds to \$221 million. The company shed approximately 10 percent of its global workforce of 21,000.

But by the beginning of fiscal 2010, Nosbusch reports, things began to turn around. "Manufacturers place orders with Rockwell when they're confident about demand for their own products," says John Heywood, an economist at the University of Wisconsin, Milwaukee. "The company is doing well financially, so that's a sign that customers are feeling more optimistic about the economy."

For fiscal 2010, reported earnings more than doubled, to \$464 million on \$4.86 billion revenue, which increased 12 percent. The positive news continued into the first quarter of 2011, as the company reported earnings nearly doubling and revenue up 28 percent.

PATHS TO GROWTH

By targeting the most promising sectors for industrial automation (cars, food and beverage, and infrastructure builders) and the most robust regions (China, India and Latin America), Nosbusch says, Rockwell can achieve 6 to 8 percent annual organic growth over a business cycle. The company should be able to generate an additional point or two of growth through "bolt-on" acquisitions that juice the top line, the CEO says. In fact, during the past five years the company has spent close to \$400 million on acquisitions that either have increased exposure to particular industries or have expanded its reach into different markets.

Rockwell now operates in 80 countries, and sales outside the U.S. account for half of its revenue. Nosbusch says the goal is to increase that to 60 percent within the next five to seven years. Emerging markets represent 20 percent of sales, a figure that has doubled in the past decade. "It used to be that these markets were depending on low-cost labor to compete," Nosbusch says. "That's still a factor, but now they're investing in automation to capture the same advantages that manufacturers in developed countries have." ■

IN MY OWN WORDS



KEITH NOSBUSCH
CHAIRMAN AND CEO,
ROCKWELL
AUTOMATION INC.

- ▶ **If I could meet my 20-year-old self, I'd advise him...** to find an opportunity to live abroad. Today business success requires cross-cultural competencies.
- ▶ **My worst job was...** delivering newspapers on dark, cold Wisconsin winter days.
- ▶ **My favorite way to unwind is...** spending time with my family and supporting my kids' activities over the years.
- ▶ **My favorite book is...** *The Loyalty Effect: The Hidden Force Behind Growth, Profits and Lasting Value* by Frederick F. Reichheld.

BY SHARON KAHN

READY & ABLE

WHY EMPLOYING PEOPLE WITH
DISABILITIES IS GOOD FOR EVERYONE

Photographs by Andrew French

PAUL MAZZOLI WORKS ON “INNERS” AT THE CAVERNOUS **WALGREEN CO.** (WAG) distribution center in Windsor, Conn. As boxes slide down an assembly belt to his station, he slices them open and removes the shampoo, aspirin or any of the thousands of other products that may be inside, packaged in plastic wrap or smaller boxes. He then places the individual products in a bin and sends them off to another station, where they are prepared for shipment to one of the company’s 7,600 drugstores. Mazzoli consistently meets his position’s “rate” of processing at 93 products an hour, which makes him one of the distribution center’s superstars — regardless of his Asperger’s syndrome.



ON THE
WEB

Learn how CACI INTERNATIONAL INC. (CACI) is providing training and jobs to war veterans with disabilities at nysemagazine.com/veterans.



THOMAS PELLETIER'S epilepsy doesn't hinder his performance at Walgreens' Windsor, Conn., distribution center.



“ SUPERVISORS
GENERALLY SHOW YOU
HOW TO DO SOMETHING,
THEN WALK OFF. NOW
THEY LOOK TO SEE WHAT
MOTIVATES INDIVIDUALS. ”

— RANDY LEWIS, Walgreens' senior vice
president of supply chain and logistics,
who conceived the company's program to
employ people with disabilities in 2007



JAMIE GRAHAM (right), a Walgreens
employee who has Down syndrome,
with Joe Wendover, outreach
manager at the company's Windsor
facility. Walgreens focuses on
inclusion, hoping to prevent an “us
versus them” environment.

Mazzoli is not an exception at the center. Of its 457 employees, more than 40 percent identify themselves as having a disability. Before the Walgreens opportunity, many — such as Jamie Graham, a young woman with Down syndrome — had been deemed unemployable and hadn't held a job before. Others had worked a series of temporary jobs. Thomas Pelletier, a 42-year-old with epilepsy, had been let go from a number of jobs after suffering seizures. He still has an average of one seizure a day, but, wearing a bike helmet and elbow pads as protection, he manages just fine working in receiving.

Mazzoli, 22, reports his own share of previous job disappointments. He gets nervous easily and couldn't keep up with the pace of washing dishes at a local pizzeria (although he's learned to work as quickly as anyone without disabilities at the distribution center). The local grocery store had hired him as a bagger but moved him to janitorial work after he spoke inappropriately to customers. "Sometimes I have outbursts, so I prefer not to work directly with the public," Mazzoli says. But since he "didn't want to be washing toilets my whole life" — and Walgreens offered a higher salary — he applied at the distribution center shortly after it opened in 2008.

Of the approximately 10,000 workers in Walgreens' 19 distribution centers, about 8.5 percent report some form of disability, according to Deb Russell, the company's manager of outreach and employee services, who notes that the logistics division aims to hire 2,000 people with disabilities in the next few years. In addition, Walgreens hopes that a pilot program that involves hiring people with disabilities in its stores, now under way in Texas, will go chainwide in 2012.

Walgreens is not alone in its efforts to hire people with disabilities. Each year *Careers & the disABLED* magazine names 50 Top Employers based on readers' votes. The 2010 list includes **THE BOEING CO.** (BA), **HEWLETT-PACKARD CO.** (HPQ), **IBM CORP.** (IBM) and **VERIZON COMMUNICATIONS INC.** (VZ). "Sometimes being a great employer is just a mindset — that people with disabilities

are welcome and can do the work as well as anybody else," says the magazine's editor, James Schneider.

UNTAPPED TALENT

Of course, hiring people with disabilities is also the law. The Americans with Disabilities Act, or ADA, put into action two decades ago, prohibits discrimination against employees with disabilities as long as they can do the work and requires U.S. employers to provide "reasonable accommodations" to help employees do their jobs. The U.S. Equal Employment Opportunity Commission, or EEOC, enforces these regulations.

Other countries have similar legal requirements. Spain, for example, fines companies with more than 50 employees that don't fill at least 2 percent of their jobs with disabled individuals, says Greg Netland, an executive board member of **RANDSTAD HOLDING NV** (Euronext: RAND), who also has responsibility for U.S., Canadian and Latin American operations at the global staffing solutions company, which has headquarters in the Netherlands. Since its start in 2004, he reports, the company's Spanish-based nonprofit Randstad Foundation has advised and helped more than 6,000 people with disabilities, resulting in actual placement of almost 2,000.

But while the legislative nudge may be a catalyst, "employers look at the increased diversity that hiring people with disabilities brings to their workforce and realize that they've benefited from tapping into a deeper labor pool," says Joyce E. Tucker, who is Boeing's vice president of global diversity and employee rights and who, as commissioner of the EEOC from 1990 to 1996, helped employers implement the ADA.

James G. Carlson, chairman and CEO at **AMERIGROUP CORP.** (AGP), says his company — a managed-health-care provider that serves people eligible for Medicaid and other publicly funded health-care programs — is committed to diversity in the workplace. "If we are serious about evolving to meet the needs of the next five years, we must have leaders that are com-



“I LEARNED TO SEE INNERS AS SOMETHING TO OVERCOME.”

— PAUL MAZZOLI,
a Walgreens employee who has
Asperger's syndrome

mitted to diversity," he says. "That means more than just ethnic or gender diversity; it also means embracing those who think and act differently. An inclusive, respectful and equitable work environment is a competitive necessity."

In fact, Amerigroup considers the employment of people with disabilities core to its culture, says Linda Whitley-Taylor, executive vice president of human resources. Besides helping the company better understand how to serve its customers, she says, "we have found many in this population to be more productive than our associates without disabilities because they want to be loyal — they want to do a good job for you."

To help people with disabilities become more employable, Amerigroup partnered with the American Association of People with Disabilities and local independent living centers three years ago to host Disability Mentoring Day. The annual event hosts 18 to 20 individuals at the company's Virginia Beach, Va., headquarters. Following presentations on Amerigroup's business model,

participants are paired with senior executives who help them discover where their skills and interests lie, work with them on their résumés, and coach them on how to market themselves, whether to Amerigroup or other companies.

“The interesting thing is, we don’t really tell them anything different than we would tell any group of job seekers,” says Whitley-Taylor. “Some get overwhelmed — as does anybody who’s looking for a job. This one-on-one approach helps them focus on where their skill set might be a fit and which companies they may have a passion to work for.” Last year Amerigroup invited one of the attendees to join its human resources team.

Like Amerigroup, Boeing celebrates the diversity that employees with disabilities bring to its team. The company commemorates October as Disabilities Awareness Month, during which, Tucker says, “we focus on how individuals with disabilities have contributed to Boeing as well as to the U.S.”

This includes people like Jeff Sykes, who co-founded the Puget Sound chapter of the Boeing Employees Ability Awareness Association and served as its president for five years. A Boeing employee for more than two decades, Sykes currently is a systems manager in the Seattle test and evaluation center, where he tracks the progress of flight testing of new aircraft models.

In 1969, Sykes broke his neck on a high school football field. He has used a wheelchair ever since, as well as a “finger extender” that lets him type with one finger and use a cell phone with large keys. After graduating from Eastern Washington University in 1976, Sykes opened a private practice as a speech therapist, then earned a degree in programming before joining Boeing’s IT department in 1989. After 10 years in Boeing’s community relations department, he switched to systems management. “I’m the kind of person who likes to learn something and move on to something new, and Boeing encourages that,” says Sykes, who also serves on Continental Airlines’ Disability Advisory Board for **UNITED CONTINENTAL HOLDINGS INC. (UAL)**, where he helps make air travel more accessible.

BEING ACCOMMODATING

Boeing needed to make some workplace modifications for Sykes: He has an assigned parking space, where he transfers to his motorized wheelchair each morning, and his desk was raised and outfitted with U-shaped drawer handles that he can open easily. But that’s it — nothing complicated or expensive.

Boeing makes similar accommodations for other staffers, providing large-print software or voice-activated technology for the visually impaired, and employees with hearing loss are paired with signers or issued BlackBerrys.

Belinda Shannon, vice president of equality and inclusion at **GLAXOSMITHKLINE PLC (GSK)**, echoes a common approach to accommodations when she says, “Our view is that an employee with a disability is no different from anyone else. We need to give all employees the tools to do their job.”



“ I’M THE KIND OF PERSON WHO LIKES TO LEARN SOMETHING AND MOVE ON TO SOMETHING NEW, AND BOEING ENCOURAGES THAT.”

— JEFF SYKES, a Boeing employee for more than 20 years

Of course, it’s the employees themselves who usually know best what accommodations would help them the most, and companies agree that they need to create a comfort level that encourages individuals with disabilities to ask for help. GlaxoSmithKline maintains a staff of medical personnel that can help employees determine and obtain reasonable accommodations. The company’s Stay at Work program can help individuals if they need workspace alterations or tools, such as ramps or scooters for those who have trouble walking long distances; the Field and Remote Team finds solutions for workers who travel frequently. “It might be tinting on their windshields, or an extra seat for an employee who needs additional space on an airplane,” Shannon says.

IT’S ABOUT MORE THAN TECHNOLOGY

The growing prevalence of disability-friendly technology, such as lasers that help paralyzed individuals use computers, is a big gain for those with disabilities. “Automation gave us the courage to hire people with disabilities,” says Randy Lewis, Walgreens’ senior vice president of supply chain and logistics. Lewis, whose 22-year-old son Austin is autistic, conceived the program to employ people with disabilities as part of a plan to open Walgreens’ first highly automated distribution center, in Anderson, S.C., in 2007.

According to Lewis, Walgreens’ board did not object when he made the proposal — even when he told them that he wanted one-third of the workforce to be people with disabilities who had never held jobs before. “They said, ‘What if it doesn’t work?’” Lewis recalls. “I said, ‘Then we’ll try something different, but it will be the failure we’re most proud of.’ It exceeded our expectations.”

A streamlined work flow at both the Anderson and Windsor facilities — which includes touch-screen computer displays that show whether the processing rate is on target and scanners that count products — simplifies everyone’s job, whether they have disabilities or

SHARED INSIGHT

Walgreens has hosted executives and employees from **LOWE'S COMPANIES INC. (LOW)**, **BEST BUY CO. INC. (BBY)** and other companies at its facilities to demonstrate how they can successfully employ people with disabilities. Here's some advice from the Walgreens team.

START WITH A ROCK STAR

If the first person you hire with an obvious disability does well, doubters are likely to be won over.

FIND A STAFFING PARTNER

"Tap into the expertise of a [local] agency that serves people with disabilities," says Deb Russell, Walgreens' manager of outreach and employee services. Such an agency can provide

job candidates and often offer preliminary training to ease people with disabilities into the workforce. In addition, it can advise on what people with specific disabilities need to be successful in their jobs.

FACE FEARS WITH EDUCATION

While Walgreens does not provide extra training for its employees with disabilities, it does coach managers and co-workers on how

to be sensitive to those employees.

REGARD PEOPLE INDIVIDUALLY

"A lot of our managers were concerned about saying the wrong thing or making a mistake when working with people with disabilities," Russell recalls. But there are no rules, and unexpected obstacles are sure to arise. "We have to learn what works for each individual," she says. "That may involve

taking some risks — for example, trying someone at different workstations or looking for different motivators."

HOLD YOUR GROUND ON STANDARDS

According to Randy Lewis, Walgreens' senior vice president of supply chain and logistics, "everybody has to do their job, and we pay our employees with disabilities the same as we pay everyone else."

SHRUG OFF CRITICISM

"We hear that we're employing too many people with a particular disability and not enough with a different disability," Russell says. "We hear we're hiding people with disabilities by having them work in our distribution centers. We just take it all in stride." And Walgreens will continue to do so, because "this is the best thing our company has ever done," Lewis says.

not, says Lewis. But the types of accommodations that matter even more, he adds, are intuitive, such as identifying each station not just by numbers but also by graphics — a strategy that helps employees who can't read. For example, a manager can tell an employee to report to the station in the transportation section with the wagon photo, making it easier to find.

It's important to know what motivates and troubles each individual, says Joe Wendover, outreach manager at the Windsor center, who holds a two-hour group orientation for each new employee. Although they are not required to reveal their disability, "everything they tell us helps us help them," he says. "For example, one of our employees with autism told me he gets sick if he has to wear a shirt with a tag on it. So I make sure that when we pass out shirts, his tag has been removed."

Mazzoli's "accommodation" is a form of positive reinforcement. "I learned to see inners as something to overcome," says Mazzoli, a self-described geek. He holds up the box cutter he uses to slash open boxes and plastic wrap. On its

handle is a picture of Yoda from *Star Wars*. "I have five different knives," he says. "Each is a warrior that fights an arch nemesis with skills that I might find useful on a given day." Yoda displays wisdom, he explains, noting that he chooses that cutter when he has particularly complicated boxes to unload.

Mazzoli says Walgreens also offers resources that help him cope, such as a secluded area where he can be alone when his anger bubbles. And he carries a resource card that contains the names of three people he can talk to if he needs support.

KNOCK-ON EFFECTS

When it comes to training, Lewis says that Walgreens does nothing different for disabled versus nondisabled employees. The company does, however, spend more time training managers and staff on dealing with employees as individuals. Managers from all buildings can spend a week attending what is called Inclusion University, and beyond

sensitivity seminars, they work alongside employees with disabilities on the floor. "People at our distribution centers treat each other with more patience," says Lewis. "There's more teamwork. When something stops working, people don't stand around waiting for maintenance. They grab a broom or a rag and clean up their work area."

Managers and other workers, he says, have learned to treat people as individuals. "Supervisors generally show you how to do something, then walk off. Now they look to see what motivates individuals. They tell each other stories about how they made John successful, or how they helped Bob do his job better or how Jim helped Susie," Lewis says. "That attitude gives meaning to work. You hear people say, 'Working here has made me a better team member, a better manager—and also a better father, a better wife, a better citizen.' We knew we would change the lives of people with disabilities when we started hiring at Anderson," he adds. "Just as importantly, it's changed lives of people without disabilities." ■



SHAREHOLDERS GET A SAY ON PAY

Now that SEC rules let investors vote on compensation and more, here's what to do.

BY REBECCA McREYNOLDS

TO EXPLAIN THE NEW RULES issued by the SEC in January giving shareholders more say in the boardroom, NYSE Euronext brought together a panel of experts to discuss what these “say on pay” and “say on frequency” votes mean for companies and their boards of directors. The main message was that now is a good time for boards to ramp up shareholder outreach to ensure investor buy-in around important proxy items, says Stephen Brown, director of corporate governance and associate general counsel at TIAA-CREF. “We are entering a new era in which shareholders do matter, so it’s up to the board to educate and engage shareholders around key issues,” he explains.

That’s because say on pay is just the beginning, corporate governance officials agree. Investors will soon be weighing in on a variety of topics as

regulators continue to promote increased disclosure and investor input. The NYSE’s amendment to Rule 452, whereby brokers are no longer allowed to vote on compensation matters without specific instructions from their clients, is another factor to consider when planning a communications strategy. In this new environment, the most successful boards will be those that get in front of their shareholders with a compelling message and are willing to open new lines of communications that encourage feedback before the do-or-die proxy vote, says Patrick McGurn, special counsel at Institutional Shareholder Services, a subsidiary of **MSCI INC.** (MSCI), a global provider of investment decision support tools. The NYSE Euronext panel recommends the following best practices to help close the communication gap between stakeholders and boards.

1

PUBLISH READABLE PROXIES

Too often proxy statements are viewed as — and written like — legal documents, says Kenneth Bertsch, president and CEO of the Society of Corporate Secretaries and Governance Professionals. It's been five years since the SEC began mandating broader disclosure in the Compensation Discussion and Analysis section of proxy statements, he says, but too many companies still try to cram too much information into too few pages with very little explanation about compensation policies and how they were developed.

When that happens, Bertsch says, companies miss out on a critical investor communication tool. More important, with issues such as say on pay and say on frequency now on the agenda, confused readers can easily become disgruntled voters, he warns. "You need to give the explanation in a precise and attractive way so that people read it and understand what you are saying."

Bertsch points to **GENERAL ELECTRIC CO.**'s (GE) proxy as a model. The company began expanding its CD&A section several years ago, and in its 2010 proxy, 10 full pages were dedicated to spelling out exactly how — and why — its executive compensation package was good for investors. "It's very straightforward and readable," he says.

2

LAUNCH A CAMPAIGN

A well-orchestrated road show can go a long way toward building a long-term partnership with your institutional shareholders, says Brown of TIAA-CREF. It starts with the board of directors ensuring that the company is sending out the right team with the right message, he adds. That team should include the senior person in charge of governance and board matters who can speak knowledgeably about how compensation packages are planned and designed. "We also would like to have an independent board member or the chair of the executive compensation committee attend the road show," Brown says.

In the absence of a personal representative, it is important to have someone in the room (or on the phone) who can speak for the board and can follow up directly with the board. For example, when **AVON PRODUCTS INC.** (AVP) scheduled a meeting with TIAA-CREF in the fall of 2010, Brown worked with the company's investor relations team ahead of time to create the agenda and to ensure that TIAA-CREF's top issues would get equal weight with the company's program. Then the meeting was led by Avon's general counsel and included the company's senior executives for compensation, investor relations and SEC disclosure.

3

WELCOME SHAREHOLDER VIEWS

A company truly committed to developing a dialogue with shareholders should invite them for a visit, recommends McGurn of ISS. **PFIZER INC.** (PFE) started doing this several years ago, he says, by inviting portfolio managers to sit down with the company's top compliance executives for open-ended discussions. That has led to more one-on-one interaction between institutional investors and company management, he adds.

Another recommendation is for companies to schedule a fifth analyst call every year — one that doesn't deal with quarterly financial reports, McGurn says. This call would include board members, and the discussion would focus on such issues as executive compensation, succession planning and corporate governance, he explains. "This is a suggestion that has been out there for a while," McGurn notes, adding that with shareholders' increasing voting power, now would be a good time to institute such a program. ■

Learn more about the NYSE Euronext panelists' views on voting frequency at nyse.com/sayonpaywebcast.

SAY ON GOLDEN PARACHUTES

As of this year, shareholders will also have a say on executives' so-called "golden parachute" deals. Under the SEC's new rules:

- » **Companies must disclose** all compensation arrangements with executives in connection with merger transactions, including any specific agreements and understandings that the acquiring and target companies have with the named executives of both companies.
- » **Disclosure also is required** in connection with other transactions, including going-private transactions and third-party tender offers, so that the information is available for shareholders regardless of the structure of the transaction.
- » **Public companies may**, however, ultimately avoid a golden parachute vote if they fully disclose their arrangements and include them in a general say on pay vote, provided that the arrangement is not modified after its prior approval.

TUNNEL VISION

The world's most powerful particle accelerator may help us understand the mysterious parts of the universe.

BY JOHN McLAUGHLIN

BURIED NEARLY 330 FEET below the Swiss-French border, the world's largest machine uses giant magnets and a near perfect vacuum to whip beams of tiny subatomic particles in opposite directions around its 16.6-mile circumference at ever increasing speed, smashing them into one another at near light speed in a fearsome particle train wreck. And if the sheer scale of the Large Hadron Collider, or LHC, is impressive, the goal is downright staggering: to glean knowledge from these particle collisions that will shed light on the basic laws of physics and the structure of space and time.

It's a complicated business. According to the European Organization for Nuclear Research (a.k.a. CERN), which spearheaded the multi-billion-dollar project, simply making the particle beams collide "is akin to firing needles from two positions more than six miles apart with such precision that they meet halfway." When the particles do collide, massive detectors — the largest of which weighs approximately 15,432 tons — record the results, and thousands of scientists around the world analyze them, hoping to fill in the gaps in our knowledge of matter. So what are they looking for? Some hope that the collisions will produce the elusive Higgs boson, a particle that has never been detected but is theorized to be an integral part of the material world. Others study the collisions of heavy ions, in an attempt to create minuscule amounts of the kind of matter that existed in the first moments of the universe. Indeed, one of the LHC's purposes is to create conditions similar to those that existed just after the big bang, if on a much smaller scale. That opens up all manner of potential marvels:

CERN describes its mission matter-of-factly as investigating "what gives matter its mass, what the invisible 96 percent of the universe is made of, why nature prefers matter to antimatter and how matter evolved from the first instants of the universe's existence." In short, the LHC will help uncover the laws that govern life. Currently, as CERN says, "all the matter we see in the universe counts for only 4 percent of its total mass," so there's plenty to be discovered.

ONE OF THE LHC'S PURPOSES IS TO CREATE CONDITIONS SIMILAR TO THOSE EXISTING JUST AFTER THE BIG BANG.

The technology behind this immense machine is noteworthy, and a host of international companies helped put it together. For example, a team of 300 worked at the Belfort factory of French power generation and transport company **ALSTOM SA** (NYSE Euronext: ALO) from 1998 to 2006 to produce more



ROUND AND ROUND
Each particle whips around the 16.6-mile ring more than 11,000 times per second.

MAXIMILIAN BRICE/COURTESY CERN



THE LHC BY THE NUMBERS

9,593

Number of magnets inside the LHC that bend and focus the trajectory of the particle beams as they accelerate toward impact inside a vacuum, where the pressure is 10 times less than on the moon

13,228 TONS

Weight of the iron in the magnet system of the LHC's CMS detector. That's almost twice as much iron as makes up the Eiffel Tower.

-456.25°F

The LHC's magnets must be cooled to this temperature or lower in order to become energy-efficient superconductors.

0.999999991c

Top speed of particles in the LHC — that's 0.999999991 times the speed of light (c)

600 MILLION

Number of particle collisions per second. Each generates temperatures that are more than 100,000 times hotter than the sun's core.

8,000

Number of international scientists who have contributed to experiments related to the LHC. CERN employs a staff of 2,400.

\$5.3 BILLION

Cost of construction, including personnel and materials

DEEP SCIENCE

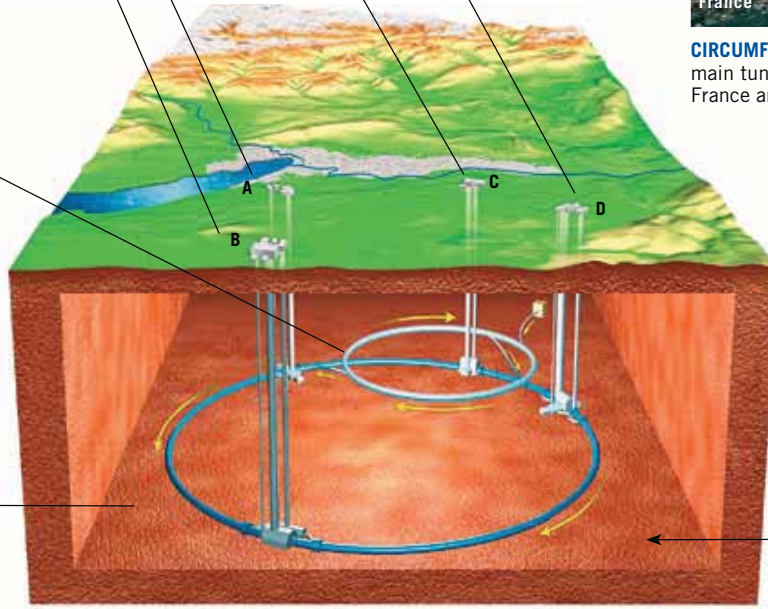
Far beneath the earth's surface, CERN aims to discover the secrets of the universe's beginning.

DETECTORS Research facilities sit atop deep caverns, each housing a collision-point detector that captures particle data.

SUPER PROTON SYNCHROTRON This 4.3-mile particle accelerator was built in the 1970s; today it accelerates particles and then "injects" them into the LHC.

DEPTH The LHC is buried at an average of 330 feet. CERN installed it underground because the land there is less expensive and the depth provides a shield from radiation.

VACUUM The atmosphere inside the ring is purer than that of outer space.



CIRCUMFERENCE The 16.6-mile main tunnel straddles the border of France and Switzerland.

than 400 dipole magnets and 600 metric tons of superconducting wire and cable, explains Charles Soothill, Alstom Power's senior vice president of technology. "We conducted 90,000 electrical and chemical tests using half a million liters of liquid helium, and produced enough filament to go from the earth to the sun 10 times," he says.

Industrial gases company **L'AIR LIQUIDE SA** (NYSE Euronext: AI) built the cryogenic ring that keeps the LHC's magnets cooled to -456.43°F. Catherine Candela, managing director of the company's advanced technologies division, says that "the size and complexity of the project made it unique for us. We have experience in refrigeration. But the challenge was to make it much bigger than usual cryogenic lines."

That imposed unheard-of demands in terms of precision and performance, given that 2,600 similar components had to be manufactured to a precision of up to a tenth of a millimeter. Air Liquide says it developed

a string of other innovations, including processes to test the cleanliness of pipes that were difficult to access by hand. "It was not a long calm river," Candela recalls.

A couple of weeks after the startup, an electrical incident unrelated to the cryogenic system occurred between two magnets, forcing the whole machine to close down for 14 months. But by late 2009, Air Liquide's cryogenic system was once again cooling the LHC

AIR LIQUIDE MANUFACTURED 2,600 COMPONENTS TO A PRECISION OF UP TO A TENTH OF A MILLIMETER.

with the same precision, Candela adds.

German electronics and electrical engineering company **SIEMENS AG** (SI) was instrumental in developing the electro-pneumatic positioner component that controls the helium supply valves in the LHC. Siemens

product manager Klaus-Peter Heer says one challenge was managing the radiation generated during operation, which might destroy the positioner's electronics system. He says the company resolved the problem by moving the positioner's electronics to "special boxes in tunnels where no measurable radiation exists."

All three executives say that involvement in the LHC project helped forge teams of expert engineers and generated technologies that could be used in and sold to allied industries. Siemens, for instance, reports that it has sold its split positioner to the nuclear energy industry, boosting its public image as well as enthusiasm for other big-ticket projects. And Alstom's Soothill and Air Liquide's Candela hope to keep the same team spirit for the ITER Project, a mammoth scientific experiment under construction in the south of France that will delve into the use of nuclear fusion as an energy source. This, they say, makes the LHC less of an end and more of a beginning. ■

LISTING IN LONDON

International issuers have a new entry point to NYSE Euronext



A new London exchange is now open for international issuers to raise capital and list their securities. NYSE Euronext London unites the visibility of London as one of the world's leading financial centres with NYSE Euronext's leadership in the European markets, a powerful combination that is expected to attract international issuers, as well as financial intermediaries and investors.

"This is a natural next step in NYSE Euronext's evolution and a logical extension of our European exchanges," says Dominique Cerutti, NYSE Euronext president and deputy CEO. "NYSE Euronext London combines the strength and visibility of our global brand and our leadership position in European cash markets with NYSE Liffe's established presence in London and worldwide. Moreover, NYSE Euronext London strengthens the competitive position of NYSE Euronext's European markets."

Complementary to NYSE Euronext's markets in Paris, Amsterdam, Brussels and Lisbon,

NYSE Euronext London offers international issuers the opportunity to list shares and depositary receipts on the Official List of the U.K. Listing Authority, or UKLA. In addition, issuers will benefit from having their securities traded on NYSE Euronext's state-of-the-art Universal Trading Platform (UTP), which connects all its European securities markets and represents Europe's largest cross-border equity exchange. "If you come to NYSE Euronext, you're accessing a global market with the deepest and broadest pool of liquidity of any equities exchange group – a market that is evolving to ensure this pool of liquidity and investor base only continues to grow," says Ronald Kent, CEO of NYSE Euronext London and head of International Listings at NYSE Euronext.



One of the ways NYSE Euronext is doing so is through its rollout of UTP across the Atlantic for all products in 2011, says Kent. "UTP is the technology enabler, the foundation of a connected market," he says, "connecting our markets and investors in ways that are simply better, more frequent and with more touch points than any other global exchange group."

Kent believes this vision of a unified market with an open-architecture philosophy will attract international companies that are determined to tap the London market yet, up to now, could not consider NYSE Euronext an option.

"Our new London exchange provides issuers with all of the global visibility and market quality an NYSE Euronext listing affords," he says. "Whether it's via London or any of our other exchanges, you enter our harmonized pan-European marketplace where everyone is treated equally. Some other exchanges treat their domestic and international companies differently and this separation can contribute to a poorer market quality for those segregated international companies."

As of the end of 2010, NYSE Euronext's European markets listed companies with a combined market capitalization of €3.6 trillion (US\$4.9 trillion) and trade more than €6.3 billion (US\$8.5 billion) worth of equity securities daily among a broad and deep investor base made up of U.K., Eurozone, U.S. and international investors. Trades are executed in major international currencies, including the U.S. dollar, the euro and the pound sterling.

NYSE Euronext has a long-standing presence in London with NYSE Liffe, its market-leading international derivatives business that began as The London International Financial Futures Exchange (LIFFE) in 1982. The trading of NYSE Euronext-listed international securities is supported by a robust, fully electronic, straight-through clearing and settlement system. This infrastructure, explains Kent, not only plays a key role in enhancing liquidity and market quality, but provides full central counterparty services. This, he says, has the effect of reducing systemic and settlement risk for investors. "All of this," he adds, "can lead to a lower cost of capital for issuers."

For more info contact:

Ronald Kent

EVP and Head of International Listings,
CEO of NYSE Euronext London
NYSE Euronext
+44 (0)20 7379 2642
+44 (0)7771 922 052
rkent@nyx.com

Diederik Zandstra

Executive Director International Listings,
COO of NYSE Euronext London
NYSE Euronext
+44 (0)20 7379 2577
+44 (0)7817 779 435
dzandstra@nyx.com

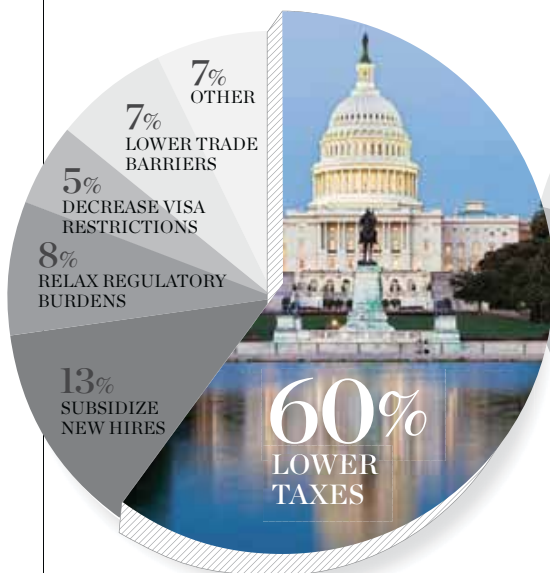
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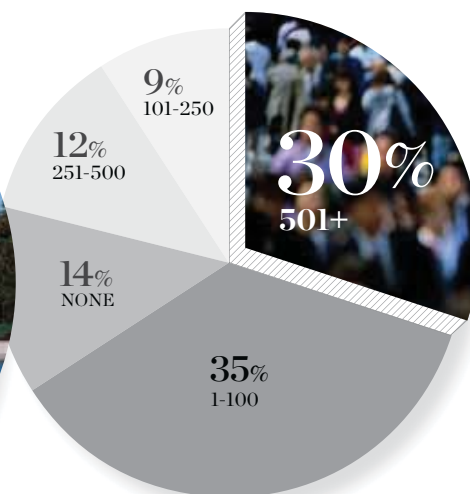
An NYSE Euronext survey and event focus on job creation.

» Going public spurs growth. That was among the findings of the 2011 NYSE Euronext Employment Pulse Survey, which shows that the vast majority of companies that went public in the past 10 years added jobs, with more than half adding 100 or more jobs. The results were shared at a roundtable on Capitol Hill in March that brought together U.S. business leaders, members of Congress and other key policymakers to discuss measures to boost job growth and remove regulatory obstacles to IPOs. At the event, NYSE Euronext CEO Duncan Niederauer called on business leaders to remain engaged with legislators and regulators to “spur IPO growth and, ultimately, create jobs and stimulate the economy.”

How can the U.S. government best help you create jobs?



*How many new jobs has your company created since its IPO?**



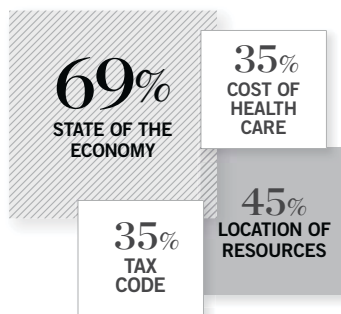
*Asked of companies that went public in the past 10 years

Where will the majority of your newly created jobs in 2011 be based?†

63% IN THE U.S. / **26%** OUTSIDE THE U.S.

†11% of respondents had no plans for job creation in 2011.

What factors play a role in where you hire future employees?



Is your organization currently hiring in the U.S.?

29%
{NO}

{YES}
71%

AREAS THAT ARE EXPERIENCING HIRING GROWTH

50% Operations/Manufacturing

44% IT/Technology

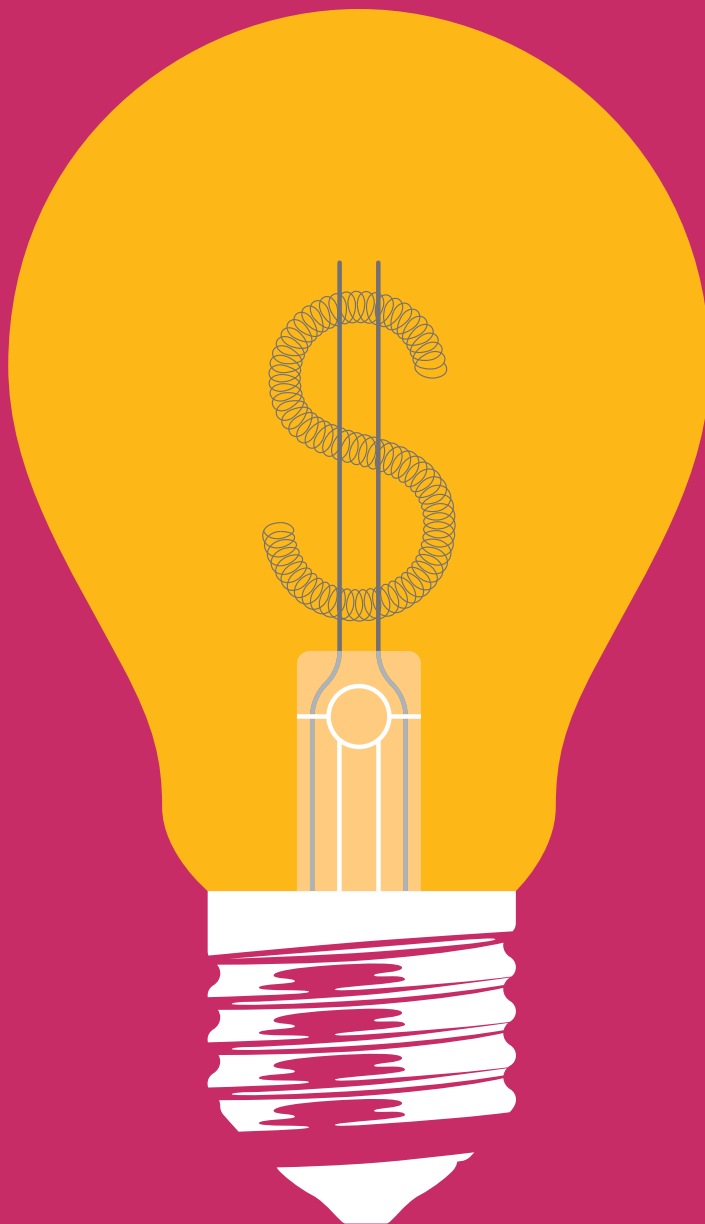
42% Sales

39% Finance and Accounting

29% Marketing

24% R&D

10% Human Resources



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