The automotive industry presents a huge opportunity, thinks Cisco. “In our view, the Internet of Cars is really a prominent example of what the Internet of Everything can deliver in terms of value. Eight million traffic accidents cost 1.2 million lives every year,” said Andreas Mai, director of product management for the Smart Connected Vehicles business unit at Cisco. According to the World Health Organization, between 20 million and 50 million people are injured in traffic accidents each year.

Tackling the massive problem of traffic accidents is just a start. Cisco is convinced that when most vehicles are connected to the Internet of Everything, not only will many lives be saved but a lot of benefits will accrue to vehicle users, carmakers, service providers and society at large.

Based in North America presently, Cisco’s Smart Connected Vehicle business unit employs roughly 20 people, a number that could grow to as many as 60 by the end of the year. “Since last April when the business unit was set up, we have done all our customer visits, customer requirements selections and have reached the stage of concept commit for our product. We have committed to build this,” Mr. Mai said.

To launch this new product, Cisco had to be convinced that it was addressing a market of at least $1 billion, its minimum threshold to get into a new domain.

The Smart Connected Vehicle team is creating a secure software gateway to the vehicle. This gateway, said Mr. Mai, “delivers all the capabilities that Cisco can provide, including optimization for all communications to the vehicle and also security. Security is one of the major challenges in connected vehicles.”

The secure automotive gateway envisioned by Cisco is an end-to-end solution, comprehending the vehicle and the cloud. The onboard portion is a light software client that could reside in a telematics unit or be integrated into a shark fin antenna. It would handle multiple connections: vehicle to vehicle, vehicle to infrastructure, vehicle to cloud and vehicle to pedestrian. “The software client needs to tie seamlessly into the back-end architecture, which hosts traditional Cisco services such as network optimization and enterprise-grade security and performance,” said Mr. Mai.

The first product to bring in revenue will be the onboard software client, but Cisco is also having discussions with some potential customers who want help with their back-end architecture. “At this moment we are expediting our back-end solution because of very, very intense customer demand,” noted Mr. Mai.

Potential customers for the onboard software client would be carmakers or tier-one suppliers, whoever is serving as the system integrator. The back-end architecture would be sold to a hosting entity, whether it’s a telematics service provider such as OnStar, Agero, Wireless Car, Octo Telematics, or a wireless carrier.

Cohda Wireless

In January, Cisco joined with semiconductor maker NXP to invest in Cohda Wireless, an Australian technology company that specializes in vehicle-to-vehicle communications.

Cisco’s Smart Connected Vehicles Business Unit Up and Running

In May 2010 and the other in August 2011. Their work credibly documented the susceptibility of modern vehicles to both manual and remote attacks. In the latter paper the researchers reported that they were able to compromise and even control vehicle systems via Bluetooth and cellular radio links.

“Those papers were received by all of the carmakers worldwide and led them to start looking at their security to better understand what the risks are,” said André Weimerskirch, one of three managing directors of Escrypt GmbH. “The researchers did amazing work; their papers are highly regarded. They were also very clear in their conclusion that we need not panic. It is very expensive to mount these attacks, and they require very skilled experts. But in other industries, hackers...”
Consumer Reports Finds MY 2012 Vehicles Highly Reliable

More than one million subscribers to Consumer Reports magazine responded to its latest Annual Automotive Survey, the results of which were published in the April 2013 issue. Subscribers report vehicle problems they consider serious because of cost, failure, safety or downtime.

Researchers compare the reported problems for each model against the average for a given model year and assign a relative reliability score in 17 different trouble-spot categories. This data is useful for car shoppers researching how well a given model can be expected to hold up over time.

We took a closer look at how the major carmakers compared in the trouble-spot categories of electrical systems, power equipment and audio systems in 2012 models. To reach our rankings, we assign a numerical value to Consumer Reports’ scores and weight those values with U.S. sales of each model, using sales data from Automotive News, hybridcars.com and the carmakers themselves.

In electrical system reliability, which includes hybrid and regular 12-volt batteries, the problem rate for an overwhelming majority of models we looked at was less than 1%. Only the Nissan Leaf, Chevy Volt and Hyundai Sonata Hybrid scored above 2%.

As more complex, software-intensive infotainment systems find their way to mainstream models, it isn’t surprising that vehicle owners reported a higher number of serious problems with those systems. In the Audio category, where entertainment, navigation and communications system problems are accounted for, Consumer Reports’ overall average problem rate was 2% for model year 2012. In our sales-weighted calculations two carmakers, Ford and Hyundai, came in with problem rates worse than the average. Ford’s Edge, Explorer, Focus and Lincoln MKX had problematic audio systems.

Automobil Elektronik Kongress, Ludwigsburg, Germany, June 25-26, 2013

Much that happens around the world in automotive electronics gets its start in Germany, and it is often at this conference in Ludwigsburg that I hear about what to watch for in our industry. This year the conference will cover electromobility, architectures, driver-assistance systems, connectivity and infotainment, and the internationalization of markets.

Presented in a single plenary session, the conference is planned and delivered by Germany’s top automotive electronics executives. Willibert Schleuter, formerly head of E/E development for Audi, and Helmut Schinagel, former top E/E at BMW, are the conference chairmen and moderators.

Speakers include Elmar Frickenstein, executive vice president of E/E and driving experience environment, BMW; Volkmart Tanneberger, head of E/E development at Volkswagen; Harald Kröger, vice president of E/E and e-drive, Mercedes-Benz; and Uwe Michael, head of E/E, Porsche. Simultaneous English translations of the presentations are available. For more information please visit www.automobil-elektronik-kongress.de.
have demonstrated their ability to get smarter each year. Still, the papers clearly demonstrate that we need to improve the security features of cars.”

According to Dr. Weimerskirch, the cloud-connected infotainment system is the biggest automotive security threat today. “These are very complex systems, and complexity always leads to vulnerability. We use a rule of thumb: for every 1,000 lines of code there is one security weakness. An infotainment system has a few million lines of code. Each month our PCs at home receive 20 or so updates. Half of them are security updates. That is not an option in the vehicle.”

The answer for carmakers is to keep the infotainment system quite separate from the safety of the vehicle. “You can separate the two by making sure there is no physical connection between the infotainment system bus and the safety-relevant bus,” Dr. Weimerskirch suggested, adding, “That is done in aerospace but it is typically too expensive for automotive. The other approach is to create a logical separation by setting up firewalls that make sure there is no flow of unwanted data from the infotainment system to safety systems.”

Infotainment system security goes beyond the infotainment system supplier. It needs to involve every tier in the supply chain, from the carmaker down to the tier-one, -two and -three suppliers.

Dr. Weimerskirch further explained: “Security needs to be considered during the entire design, development and testing process. A security culture is what’s needed. For security to be taken seriously, a chief security officer should be assigned who reports high up in the corporate hierarchy. Carmakers need to make sure they have security technology, but also an organization and mechanisms in place to ensure security over all supplier tiers.”

There are two components to the security solution Escrypt provides: the first is on-board software that performs security functions in the vehicle ECUs; the second is the back-end server, the infrastructure required to support security features in the vehicle.

The SAE launched its Vehicle Electrical System Security Committee in May 2011, to address strategies and techniques for detecting and preventing attacks that could compromise vehicle control systems. Committee members include OEMs, tier one suppliers, semiconductor manufacturers, consulting firms, government entities, academic institutions and others. Escrypt has had an office in Ann Arbor, Michigan, since 2008. The company also maintains offices in Berlin, Bochum, Munich, Stuttgart and Wolfsburg, Germany. Later this year Escrypt personnel will begin operations at ETAS offices in Seoul, Korea, and Yokohama, Japan.

To learn more about this subject, consider attending the Escar Embedded Security in Cars Conference (www.escar.info) May 29-30, in Ypsilanti, Michigan, organized by the International School of IT Security AG. Escrypt is an event partner.

Cisco...
The Company Profile... Delphi Automotive PLC

Background
An understanding of the complex history of the company that today is Delphi Automotive PLC—from its spin off by General Motors, through its first IPO, to its emergence from four years in bankruptcy in 2009—can be found in previous company profiles of Delphi in the Hansen Report archives.

The new Delphi is leaner, smaller and believes it is well positioned to serve a diversified customer base with products designed to improve safety, boost fuel economy and keep the driver and the vehicle connected to the outside world. “Safe, green and connected” is the persistent mantra of the company.

The process of bankruptcy gave Delphi a painful but rare opportunity to sharply focus its product line. The company went from 119 product lines prior to the bankruptcy to just 33 today. It exited unprofitable business, favoring instead product segments that CTO Jeff Owens described as technology rich, where Delphi can bring greater value to its customers.

Delphi’s five largest customers, General Motors, Volkswagen, Daimler, Ford and Shanghai GM, accounted for 47% of sales in 2012. Market development efforts are focused on China, especially, as well as Brazil and India.

Delphi emerged from bankruptcy on October 6, 2009, with financing from private investment firms, General Motors (following GM’s own U.S. taxpayer-aided emergence from bankruptcy) and the Pension Benefit Guaranty Corporation (PBGC). GM sold its stake in Delphi back to Delphi for $3.8 billion in March 2011; PBGC also sold its stake back to Delphi, for $594 million. The new Delphi owners set up the business as a United Kingdom resident taxpayer as part of its tax strategy. According to Delphi’s 10-K, the company believes “there is a significant risk that the U.S. Internal Revenue Service may assert that [Delphi] should be treated as a domestic corporation for U.S. federal income tax purposes.”

Delphi makes the point that Europe is its largest market, as well as headquarters for two of the company’s four operating units.

Delphi concluded an initial public offering in November 2011, but all the shares sold were owned by private investors, so there was no financial benefit to the company. Its ordinary shares are traded on the New York Stock Exchange under the symbol DLPH.

Delphi operates 126 major manufacturing sites and 15 major technical centers in 32 countries. Of the 118,000 workers it employed at year-end 2012, only 5,000 reside in the U.S. Ninety-two percent of hourly workers are located in low-cost countries. In an attempt to weather the ups and downs of global auto production, Delphi tries to minimize fixed costs by leveraging a large workforce of temporary workers, who represented approximately 24% of the hourly workforce as of year-end 2012.

Delphi’s 18,700 engineering employees are spread throughout the world. Seven thousand are located in the U.S., Mexico...
Sales in $ millions

<table>
<thead>
<tr>
<th>Segment</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2010-2012 CAGR</th>
<th>2016</th>
<th>2012-2016 CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>E/E Architectures</td>
<td>5,620</td>
<td>6,642</td>
<td>6,815*</td>
<td>10.1%</td>
<td>9,500</td>
<td>8.7%</td>
</tr>
<tr>
<td>Powertrain Systems</td>
<td>4,086</td>
<td>4,970</td>
<td>4,656</td>
<td>6.7%</td>
<td>7,000</td>
<td>10.7%</td>
</tr>
<tr>
<td>Electronics and Safety</td>
<td>2,721</td>
<td>2,931</td>
<td>2,732</td>
<td>0.2%</td>
<td>4,000</td>
<td>10.0%</td>
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<tr>
<td>Thermal Systems</td>
<td>1,603</td>
<td>1,755</td>
<td>1,541</td>
<td>(2.0%)</td>
<td>2,000</td>
<td>6.7%</td>
</tr>
<tr>
<td>Eliminations and Other</td>
<td>(213)</td>
<td>(257)</td>
<td>(225)</td>
<td>(500)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>13,817</td>
<td>16,041</td>
<td>15,519</td>
<td><strong>6.0%</strong></td>
<td>22,000</td>
<td><strong>9.1%</strong></td>
</tr>
</tbody>
</table>

*On October 26, 2012, Delphi acquired the Motorized Vehicle Division of FCI, maker of connectors.

Delphi Margin 9.5%

and Brazil; 6,000 are in France, Poland, Germany and Luxembourg; 5,000 are in China, India and South Korea.

Delphi management is organized with business leads running each of its five product segments, and three regional leads, one for Asia Pacific, one for EMEA (Europe, Middle East and Africa) and one covering South America.

Standard and Poors gives Delphi a credit rating of BB+/positive, below investment grade, “less vulnerable in the near term but faces major ongoing uncertainties due to adverse business, financial and economic conditions.” Fitch rates Delphi BBB-/stable (investment grade).

Faster-Than-Market Sales Growth

Delphi sales declined 3.3% in 2012, despite a 5.2% increase in global light vehicle sales. Some of that increase in car sales was driven by the Japanese manufacturers’ recovery from its earthquake and tsunami, a segment of the market where Delphi is not a strong player. However, EMEA accounted for 41% of Delphi’s 2012 sales and Europe’s 5.7% vehicle sales decline had a negative impact. Despite lower revenue, Delphi produced an impressive operating margin of 9.5%.

Delphi management believes the company is poised for significant growth in sales: 9% annually from 2012 through 2016, assuming roughly 4% annual growth in vehicle volumes over that period. Mr. Owens is confident Delphi can achieve 5% faster growth than the vehicle market and noted that more than half of the $22 billion in revenue projected for 2016 is business that is already booked. “We are winning new business and we are in places that have higher revenue growth in terms of the platforms we are on. We have new content coming onboard, for example gasoline direct injection and diesel systems show good growth in this period. Active safety has very strong growth,” he said.

Delphi's optimism is also supported by its focused, technology-based portfolio, which the company says offers customers a means to differentiate their vehicles with technology. “We picked product lines with the safe, green, connected megatrends in mind; we can help solve customer problems that are going to occur around those trends,” noted Mr. Owens.

“We are happy with our portfolio, but there are some areas we could work on. For example, in the mechatronics space; it’s pretty hard to add value or differentiate with a single switch. We would favor an integrated center panel or an overhead console where you have a higher value add because you are solving a bigger customer problem,” he added.

Distinctions Claimed by the Company

◆ Manufactures more than 60 million parts per day at 2 PPM quality
◆ World’s second largest producer of automotive connection systems
◆ One of every four cars in the world runs with a Delphi wiring harness.

Safe, Green and Connected Megatrends, and Opportunity in China

For the last several years Delphi has been focusing its resources in order to ride some of the fastest moving currents in the industry.

Fuel Efficiency: Government mandates and higher oil prices have made carmakers hungry for improvements to the internal combustion engine and advances in powertrain electrification. Delphi offers fuel injection, valve train, heat transfer, engine control and power electronics capabilities.

Connectivity: As a producer of both infotainment systems and reconfigurable clusters, Delphi is well positioned to be a player as carmakers develop user interfaces that let drivers stay connected while keeping their eyes on the road and their minds on driving.

Active Safety: More than one million people die in automobile accidents each year. Delphi is a strong proponent of democratizing active safety systems based on radar and camera sensors.

China: The world’s number-one market for autos, China generated $2.3 billion in

Delphi's 2012 Operating Margin by Segment

- Electrical/Electronic Architectures: 10.6%
- Powertrain Systems: 11.1%
- Electronics and Safety: 6.5%
- Thermal Systems: 3.9%
- Delphi Margin: 9.5%

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Delphi Shareholders’ Equity

<table>
<thead>
<tr>
<th>Year</th>
<th>in $ billions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>5,366</td>
</tr>
<tr>
<td>2010</td>
<td>6,099</td>
</tr>
<tr>
<td>2011</td>
<td>2,171</td>
</tr>
<tr>
<td>2012</td>
<td>2,830</td>
</tr>
</tbody>
</table>

Delphi Segment Sales and Forecast by Year

2010 2011 2012 2016 2012-2016 CAGR

<table>
<thead>
<tr>
<th>Percentage of Delphi Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Motors 18%</td>
</tr>
<tr>
<td>Volkswagen Group 11%</td>
</tr>
<tr>
<td>Daimler AG 7%</td>
</tr>
<tr>
<td>Ford 6%</td>
</tr>
<tr>
<td>Shanghai GM 5%</td>
</tr>
<tr>
<td>Fiat Group Automobiles 5%</td>
</tr>
<tr>
<td>PSA Peugeot Citroën 4%</td>
</tr>
<tr>
<td>Renault Nissan 4%</td>
</tr>
<tr>
<td>Hyundai 3%</td>
</tr>
<tr>
<td>Toyota 3%</td>
</tr>
</tbody>
</table>
Delphi Automotive

Delphi sales in 2012, with more to come. Between 2012 and 2016, China vehicle production is expected to grow annually at 6%, compared with 4% for the global market. Delphi has been operating in China for nearly 20 years, supplying 17 of the top 20 vehicle makers there.

R&D

Even as Delphi’s sales rise, the company intends to hold the line on the funds it devotes to R&D at $1.2 billion annually, meaning R&D as a percentage of sales will decline somewhat. Mr. Owens does not see that as a cause of concern. “Our net R&D spend will stay at $1.2 billion in 2013, as it was last year, but our gross spending on R&D is climbing.” In 2012, Delphi’s gross spend on R&D was $1.6 billion, with the extra $400 million coming from customer-funded development and from government research incentives.

Mr. Owens aims to make more productive use of the funds spent on R&D. “My mission is to put more of that R&D spend into advanced engineering by being more efficient in development and in manufacturing engineering, and by executing flawless manufacturing launches. We can take those savings and invest them into our innovation factory.” In addition to the 18,700 engineers and technicians who ultimately report to him, Mr. Owens also manages Delphi’s IT organization with its roughly 1,000 employees and service providers.

Acquisitions

On October 26, 2012, Delphi acquired the Motorized Vehicle Division (MVL) of FCI, a Paris-based maker of automotive connectors owned by Bain Capital. Delphi paid 765 million euros for MVL, which had sales of 692 million euros in 2011. Liam Butterworth, president of MVL, was made a vice president of Delphi’s electrical/electronic architecture division, the division that MVL is now a part of. He is also president of connection systems for Delphi.

MVL gives Delphi further access to the French carmakers Renault and PSA as well as Nissan and Hyundai. Its squib airbag interconnects fill in a gap in Delphi’s product range. Made with precious metal plating, typically gold, squib interconnects are also packaged with a ferrite device that protects the squib from electromagnetic interference. When fired, the squib inflates the airbag. MVL was number-one in the industry for squib interconnects, annually shipping nearly $300 million worth of supplemental restraint system connectors.

According to Mr. Owens, Delphi would be interested in other acquisitions of the bolt on type, like MVL: “We feel good about where we are, so we don’t need an acquisition that makes us complete. We are, however, interested in the right opportunity. Companies with powertrain expertise would interest us. Electronics and software businesses would also be attractive, including those working in infotainment. We would also be interested in businesses that make connectors.”

New Products

Electronics and Safety

Delphi created the MyFi brand to highlight the convergence it sees between its infotainment, cluster and safety expertise, which, combined with its proven systems integration capability should make the company appealing to OEM customers. Delphi already produces connected navigation radios for Audi, GM and others, and it produces a reconfigurable display for the Cadillac CUE (Cadillac User Interface). Delphi also produces the base level CUE cluster that combines analog gauges with a TFT display. Those driver interfacing systems factor into safety, not only because they can warn a driver when his safety is at risk, but also because of their potential to distract from driving.

According to Delphi, MyFi systems could determine the information that can safely be made available to drivers, depending on the driving environment. For example, MyFi would know if the transmission is in park or drive, and customize the availability of applications based on the vehicle’s status. If the car is in park, video could be delivered via a smart device, but once the transmission shifts to drive, the video is no longer available. Instead, Internet radio and off-board navigation could appear on a high-mount screen to keep the driver’s eyes looking forward.

In an article about MyFi available on Delphi’s website, Mr. Owens writes: “MyFi encourages drivers to keep their eyes on the road and hands on the wheel by allowing them to operate their phones using voice recognition, text-to-speech, steering-wheel controls, eyes-forward reconfigurable displays and workload management technologies.”

Delphi’s MyFi roadmap includes development of workload managers, driver-state sensors, in-vehicle Wi-Fi networks and a cloud computing platform.

With the demand for airbags and other safety restraints leveling, Delphi sold its airbag business in 2009. According to the company, sales of Delphi’s popular passenger occupant detection sensors (PODS) continue to be healthy, but the company’s focus has moved to active safety. More than a decade ago, Delphi helped to pioneer forward-looking radar sensors, which it now sells to Ford and Volvo, among others. Delphi also makes side and rear detection radar sensors and expects that business to develop further, especially with more stringent NCAP safety requirements coming.
Next, Delphi is about to launch its new RACam product, which combines a forward-looking camera and radar sensor in one compact, economical and robust package. Radar and camera sensors are crucial to a number of promising active safety systems: lane-departure warning, full-speed range adaptive cruise control, obstacle and pedestrian detection, emergency braking, headlamp control and traffic sign recognition.

Delphi will produce the radar in house but not the camera; cameras are readily available from numerous sources. Delphi will also design the way the package integrates with the vehicle’s front end. It will also provide the image and discrimination processing and the software that fuses the output of the sensors into coherent form. “We do that with the help of Mobileye, with whom we’ve partnered for a long time, but we also have in-house capability,” said Glen De Vos, vice president of engineering for the Electronics and Safety segment.

Delphi has already secured $1.5 billion in active safety and MyFi bookings for shipments that will run for the next three to four years. It is Delphi’s view that as it transitions radar from gallium arsenide to less expensive silicon germanium, starting in 2015, radar applications will quickly penetrate the market. Delphi has a long history with radar, having adapted the technology from aerospace when Delphi was part of GM Hughes Electronics (1985-1997). Delphi augments its radar technology by applying digital signal processing to the algorithms that discriminate between obstacles and non-obstacles. “The algorithms are so critical—you need to make sure you see what you want to see and never get a false positive,” noted Mr. Owens. Delphi’s silicon germanium radar sensors will operate at 76 GHz, which Delphi is confident will suit multiple applications.

◆ Mr. De Vos is especially pleased with the interest Delphi has seen in its inverter and converter products. Inverters convert high-voltage DC into multiphase AC to power the hybrid vehicle traction motor and convert AC from the motor to charge the battery. Converters provide DC voltages in hybrid and electric vehicles to power accessories and the HVAC system.

“We are working on a number of new programs, primarily in Europe, where fuel prices are high and where carmakers have aggressively invested in CO2 reduction technology,” said Mr. De Vos.

Electrical/Electronic Architecture
While wiring harnesses account for roughly 60% of this segment’s sales (connectors account for approximately 30%, and electrical centers, 10%), it is called the E/E Architecture segment to emphasize the value Delphi can add to its products. By using its tools and expertise Delphi can help carmakers optimize the placement and number of ECUs and specify power- and signal-distribution system components.

“He OEM might say it is developing a new vehicle for 2018 and wants to work with us to develop the architecture and specify the components. In some cases they pay us up front for that development work; in others that cost gets amortized into the piece price, just as you recoup any investment,” explained Stephen Duca, vice president of engineering and operations for the Electrical/Electronic Architecture segment.

<table>
<thead>
<tr>
<th>Electrical/Electronic Architecture</th>
<th>Electronics and Safety</th>
<th>Powertrain Systems</th>
<th>Thermal Systems</th>
<th>Body functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>E/E Distribution Systems</td>
<td>Infotainment and Driver Interface</td>
<td>Diesel and gasoline fuel injection systems</td>
<td>Condensers</td>
<td>Comfort features</td>
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<td>Primary wiring harness assemblies</td>
<td>Advanced reception systems</td>
<td>Ignition systems</td>
<td>Radiators</td>
<td>Energy management</td>
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<tr>
<td>High power wiring assemblies</td>
<td>Audio systems</td>
<td>Air and fuel management</td>
<td>Fan modules</td>
<td>Interior lighting</td>
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<tr>
<td>Cable</td>
<td>Digital receivers</td>
<td>Powertrain electronic control modules</td>
<td>Powertrain cooling systems</td>
<td>LED modules</td>
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<tr>
<td>Cable Connection Systems</td>
<td>Satellite receivers</td>
<td>Sensors and actuators</td>
<td>Charge air coolers</td>
<td>Active safety</td>
</tr>
<tr>
<td>Standard automotive</td>
<td>Integrated premium acoustics</td>
<td>Valve train systems</td>
<td>Evaporators</td>
<td>Front, rear, side detection</td>
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<td>Device connectors</td>
<td>Navigation systems</td>
<td>Fuel handling systems</td>
<td>Heater cores</td>
<td>Radar and vision sensing</td>
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<td>Data connectivity</td>
<td>Portable device interfaces</td>
<td>Evaporative emissions systems</td>
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<td>Security systems</td>
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<td>Electromechanical clusters</td>
<td>Electrical Centers</td>
<td>Micro-channel heat exchangers</td>
<td>HEV and power electronics</td>
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<td>Reconfigurable clusters</td>
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<td>Interior electrical centers</td>
<td>Radiators</td>
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<td>Interior switches</td>
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<td>Column integration modules</td>
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<td>Battery controllers</td>
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<td>Roof modules</td>
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<td>Charge air coolers</td>
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<td>Integrated center panels</td>
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<td>Evaporators</td>
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<td>Electronic Controls</td>
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<td>Heater cores</td>
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<td>Occupant classification systems</td>
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<td>Air conditioning compressors</td>
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<td>Full and infant-only suppression systems</td>
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<td>Radiators</td>
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<td>Seatbelt reminder systems</td>
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<td>HVAC modules</td>
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<td>Airbag control electronics</td>
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<td>Micro-channel heat exchangers</td>
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<tr>
<td>Airbag control units</td>
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<td>Sensors: pressure, acceleration, combination, rollover, pedestrian</td>
<td>Body computers</td>
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The Company Profile Continued
Delphi Automotive

Delphi uses its Velocity Tool Suite to optimize the distribution system. “It’s not just an optimization tool,” according to Mr. Duca. “It is a suite of tools that are linked. We can model an electrical architecture, and once the architecture takes firm hold on a design configuration, we can take that data directly from the customer and translate it from, say, 3D mechanical models and electrical schematics into manufacturing documents, and in some cases all the way down to the manufacturing tools, jigs and fixtures. The data moves seamlessly throughout the design and development process.” According to Delphi, 30% of the Velocity software is off the shelf; the remainder is proprietary software developed by Delphi.

Wire harness manufacturing remains labor intensive. Wiring and cable manufacturing is typically done in relatively small facilities with approximately 2,000 workers considered an optimal number. Automated technology is applied selectively to wire-harness manufacturing to minimize labor costs and to eliminate variation. Semi-automated processes are applied in manufacturing products such as LVDS video cable, because the components used are so small that workers don’t have sufficient dexterity to assemble them.

Sales of high-voltage connectors, including the shielded cable used on AC lines, have gone from zero in 2009, when we last profiled Delphi, to about $100 million annual run rate today. By 2016, that business is expected to at least double in size. Delphi’s high-voltage products handle currents up to 250 amps, voltages up to 600, AC or DC.

E/EA content on a typical mid-sized vehicle costs the carmaker roughly $500. Hybrid vehicle content is nearly double, bringing the total to between $900 and $1,000. As hybrid vehicle sales reach high volumes, the added cost of the distribution system will decline.

The rise in safety systems has also added more wiring and connector content compared with four years ago. “Four years ago a high-end vehicle might have had four, maybe five airbags. Today they can have 10 or 12,” said Mr. Duca.

Roundup 2012: Valeo Up 8%, Visteon Down 9%

Valeo
2012 Sales: 11,759 million euros
Change from 2011: up 8.2%, due to growth in North America and Asia
2012 Operating Margin: 6.2%, nearly level with 2011’s 6.5% operating margin
Outlook for 2013: Based on an expected 4% decline in European automotive production along with a 1% increase in global automotive production, Valeo expects to outperform the market and maintain operating margins at the same level as 2012 (in euros). Its objectives for the medium term include operating margins above 7% of sales.

New products and growth in Asia helped drive order intake (booked business) in 2012 to 15.8 billion euros. China accounted for 18% of that new business. Among Valeo’s 2012 new business wins is the company’s first order for a DC/DC converter from an American OEM and its first order for a range extender generator.

OEM sales grew 8%, and in 2012 accounted for 84.3% of total sales. Asian and German customers represented 57% of OEM sales.

All four of Valeo’s business groups increased sales in 2012, led by Comfort and Driving Assistance Systems (parking and driver assist, interior controls and electronics) which grew 17.1%. Thermal Systems grew 6.5%; Powertrain Systems sales were up 4.5%; and Visibility Systems (lighting and wipers) sales grew 7.4%.

Acquisitions in 2012 included an 80% share in a lighting company owned by Chery Group in China, and the remaining interest in Valeo Air Conditioning Hubei, in which Valeo previously held a 55% share. Valeo and Ichikoh formed an automotive lighting joint venture in China; Valeo controls 85%.

Valeo and V. Johnson Enterprises LLC formed a joint venture, Detroit Thermal Systems (DTS), to acquire the former Visteon climate control business from Ford’s Automotive Components Holdings (ACH) division. Valeo’s share in DTS, which will be certified a minority business enterprise, is 49%. At present, Ford is the only customer of DTS.

Visteon Corp.
2012 Consolidated Sales: $6,857 million
Change from 2011: down 9.0%
2012 EBIT Margin: 4.2%, compared with 4.5% in 2011
Outlook for 2013: Sales in the range of $7.3 billion to $7.5 billion

Climate control systems were Visteon’s largest product line, accounting for 62% of sales in 2012. Interiors accounted for 20% and Electronics, 18%.

Hyundai/Kia is Visteon’s largest customer (33% of sales) and nearly half of sales (44%) were in Asia in 2012. In January 2013, Visteon announced it would sell its automotive climate control business to Halla Climate Control Corp. (HCCC) for $410 million. The consolidation will be completed by the first half of 2013. Visteon continues to hold 70% equity in HCCC.

In 2012 Visteon sold its Lighting unit to Varroc Group of India and sold its controlling interest in an Interiors joint venture, Duckyang Industry Co. Interiors is considered a non-core business that Visteon is looking to exit. Most of the global interiors business was sold to the Yanfeng Visteon Automotive Trim Systems (YFV) joint venture in China, in 2011.

Visteon’s consolidated sales in Electronics were $1.3 billion in 2012, with Ford accounting for 47%. The company sees strong growth potential in cockpit electronics (instrument clusters, displays, controls, audio and infotainment), a segment where, with 6% market share, Visteon ranks itself the number-five supplier behind Continental, Denso, Harman and Alpine. Visteon has been phasing out of the less profitable, build-to-print, low-margin vehicle electronics part of the market and is concentrating engineering efforts on next generation clusters and infotainment. According to the company, Visteon has 700 software engineers working in India.