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## IT Shortcuts On Auto's Road To Recycling

Low-Cost IT Helps ARN Comply With Tomorrow's Recycling Requirements Today

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### EXECUTIVE SUMMARY

Legal, environmental, and economic requirements are forcing carmakers to find ways to recycle 85% of their vehicles, soon to be 95%, into raw materials and service parts. To meet these mandates, OEMs and suppliers are conducting expensive experiments with new materials and designs, which may pay off far in the future. But the Netherlands is already beating set standards today with only the aid of low-cost IT. Parts management, RFID, and supply chain vendors should help carmakers find the shortcuts to recycling profits.

### RESEARCH CATALYST

Forrester met with Dave Bebelaar, Managing Director of Auto Recycling Nederlands (ARN).

### AUTO RECYCLING WORKS BEST IN THE NETHERLANDS

Carmakers worldwide have to meet ever-tougher regulations that make them accountable for recycling the vehicles they produce. The Netherlands recycles more of its cars than any other country, having already beaten the EU's tough mandate to recycle 85% of vehicles by next year, and hoping to reach 95% by 2007 — eight years ahead of the EU's schedule.<sup>1</sup>

To find out how one of Europe's smallest auto markets can profitably lead a capital-intensive process like auto recycling, Forrester visited ARN, the organization coordinating Dutch activities.<sup>2</sup> According to Bebelaar, ARN works because it is:

- **Coordinated.** ARN is owned by a consortium of auto manufacturers and scrappers and supported by the Dutch government, so each party has a stake in the program's success. On their behalf, ARN monitors and reports on compliance, negotiates lower prices for services like shipping and logistics, and provides detailed results on a car-by-car basis. ARN links all the players together via an inexpensive Web-based extranet that facilitates database access, communication, and administration.
- **Closed-loop.** Every year, 300,000 Dutch cars are deregistered and delivered to a network of 269 dismantlers. They check daily spot prices at online parts marketplaces like [www.autoline.nl](http://www.autoline.nl), [www.onderdelenlijn.nl](http://www.onderdelenlijn.nl), and [www.stiba.nl](http://www.stiba.nl), and remove high-value components that can be reused



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as service parts or secondary products. They also deliver about 20 types of dismantled raw materials to ARN for further recycling. Finally, the dismantlers tag the vehicle shells with a barcode that follows the vehicle through the shredding process, and links it to ARN's database to track the remaining material.

- **Computer-aided.** ARN now sits atop a vast database of vehicle composition information for vehicles that are up to 15 years old. This is farther back than many automakers and suppliers have kept records, so Bebelaar says that ARN's scrappers frequently have access to better data than the OEMs' own service garages. Automakers and recyclers use the data for checking the volumes of dismantled materials to prove their compliance, improving performance by developing the most efficient way of dismantling, and preventing insurance and warranty fraud.

### Technology Vendors Can Help Automakers Reach Recycling Targets On Time

Automakers are betting millions on greener vehicle materials and advanced post-shredder processing to design cars that will meet EU recycling mandates — when these cars finally get to market in several years. And “polluter pays” rules mean that OEMs and suppliers must set aside as much as \$200 per vehicle already on the road to meet European (and Japanese) recycling requirements.

All told, the auto industry is facing a multibillion-dollar responsibility. But ARN's experience shows that it's already possible to meet the recycling mandates with inexpensive, proven, and available IT (only €1.6M, about 5% of ARN's budget, is spent on IT) to supplement today's automotive materials and processes.<sup>3</sup> With more than nine million vehicles scrapped annually in the EU — excluding those in the 10 new member states — IT that decreases the cost to recycle each vehicle today will pay for itself by helping carmakers avoid recycling fees and noncompliance fines tomorrow. And in the long term, they'll make recycling a profit source, not a burden, even in less-regulated markets, such as the US. Current technologies that can help include:

- **RFID to lower recycled parts logistics costs.** ARN's barcode-based logistical coordination saves scrappers money. In the US, RFID vendor AirGate Technologies is developing RFID tags for one large remanufacturer to improve tracking and logistics of recycled parts where barcodes don't work. The system will reduce shipping errors caused when parts are incorrectly barcoded at the end of the assembly line, but will also enable future applications later in the vehicle's life cycle.<sup>4</sup> How? The tags are built to be readable from three meters away, even after years in the high-temperature environment under the vehicle's hood, surrounded by metal and grime.<sup>5</sup>

- **Parts marketplaces to match part supply with demand.** ARN's work with material prices and parts marketplaces increases availability of service parts — especially out-of-production pieces on older vehicles. In the US, The Cobalt Group's PartsVoice and eBay Autos have become massive parts marketplaces, trading billions of dollars in parts between scrappers, dealers, and do-it-yourself consumers who otherwise would not be able to find the parts they need.
- **Service supply chain apps will improve product quality and comply with safety laws.** EDS's International Materials Data System (IMDS) is an Internet-based database for collecting and reporting vehicle components' material composition to meet the End-of-Life Vehicle (ELV) Directive. OEMs, service centers, and insurers can combine this product data with service records and diagnostics tools to keep cars running safely — and meet the requirements of the US TREAD Act. For example, parts supply chain vendor Servigistics has provided Subaru with part-demand data that the automaker needs to feed TREAD databases and show suppliers where quality improvements are needed. Supply chain vendors like Servigistics and i2 Technologies can apply their reverse-logistics expertise from the electronics industry to help automakers and suppliers manage crash parts re-entering the service cycle.<sup>6</sup>

## RECOMMENDATIONS

### CARMAKERS AND LAWMAKERS MUST USE IT TO REACH RECYCLING GOALS

Automakers must make the recycling burden into a competitive advantage for their own sake and the environment's. IT vendors can help automakers and suppliers complement experimental material science with proven technology, closing the value chain loop into a sustainable, profitable value cycle.

- **Automakers and suppliers: Certify pre-owned parts.** Some OEMs and suppliers want to prevent second-hand parts trade, since they would prefer to sell a higher-margin new part instead. But a flood of cheap copy parts is already gushing in from China, meaning that this business is being undercut anyway. Just as they now profit from certified pre-owned vehicle programs, automakers should certify recycled second-hand parts and make money, as well as points with governments and environmentally conscious consumers. Having part-specific performance data from throughout the vehicle's life cycle will make accurate disposition of parts credible.
- **Governments: Give OEMs assistance without watering down principles.** Lawmakers at the EU, member state, and US federal level should emulate the Dutch model of collaboration with automakers in three areas. First, apply a marginal fee on

new-vehicle registrations to help establish the national information infrastructure for recycling. Second, consider legislation limiting gray market and imported parts that unfairly take automakers' intellectual property — these undercut the economics of recycling.<sup>7</sup> Third, support the green part certifications described above to boost consumer trust in certified recycled parts.

- **Technology vendors: Extend app suites across the entire value cycle.** In the short term, technology vendors are best positioned to help the auto industry profit from recycling part cores and end-of-life vehicles into new raw materials and service parts. Use ELV compliance to open OEMs' doors to RFID, parts management, and reverse supply chain applications. In the longer term, app vendors like i2 Technologies and SAP should develop products and partnerships that link manufacturing, service, and recycling data in a unified vehicle record for every car.<sup>8</sup>

## ENDNOTES

- <sup>1</sup> According to the ELV Directive (Directive 75/442/EEC), 85% of vehicles (as measured by weight, not by number of vehicles) must be recycled by the end of 2005. By 2015, 95% must be recycled. The Netherlands has a more aggressive timeline of 95% by 2007, which ARN's Bebelaar says, "We are not on track to meet . . . In fact, we think that target is too tough. However, we are working hard to reach that target ASAP."
- <sup>2</sup> Consumers buying a new car in the Netherlands must pay a one-time fee of €45 (US \$55), which goes into the ARN fund. Because of the efficiencies that coordination and good data management lend to the Dutch system, most cars can be profitably recovered with minimal support from the fund. So the Dutch scheme isn't just environmentally successful, it's financially viable — so much that ARN had to take steps last year to *reduce* its €164 million cash base.
- <sup>3</sup> Forrester estimates manufacturers' service supply networks to be 10 years behind their product supply networks in terms of process sophistication and use of packaged apps. The result? During the next five years, manufacturers like Ford Motor Company will scramble to fix their broken aftermarket processes and integrate their mainframe-based labor scheduling and parts inventory management apps — driving a total investment of \$2.22 billion in aftermarket-related consulting services. See the February 27, 2003, Brief "2003: Firms Seize Aftermarket Opportunities."
- <sup>4</sup> Most early adopters are focused on point-to-point integration of RFID data to one existing internal application or data source. But as firms look to incorporate this data into more flexible business processes, tools like trading partner management, process automation, and data management will become must-have features. See the August 13, 2004, Tech Choices "Evaluating RFID Middleware."

- <sup>5</sup> AirGate Technologies CEO's Mike Sheriff told Forrester that because of these and other extreme physical conditions — including a 400-degree Fahrenheit paint oven — the tag must be made of special materials. Whereas a typical RFID tag contains silicon-based semiconductors, these tags, called surface acoustic wave tags, are based on piezoelectric crystals that won't fail when subjected to high heat and radiation. See *RFID Journal's* May 19, 2004, article at <http://www.rfidjournal.com/article/articleview/948/1/1/>.
- <sup>6</sup> As much as 70% of service parts put into vehicles today are remanufactured, but only very rudimentary tools exist to help OEMs track the returned part cores that feed that process — so cores pile up in some regions, while others are out of stock, and service centers claim credit for cores they didn't gather. By integrating reverse logistics with its service parts modules, supply chain vendors could give General Motors visibility into remanufactured parts — saving General Motors as much as 65% of the material cost for warranty repairs. See the May 30, 2003, Brief “Carmakers Bet On i2 For Service Parts Management.”
- <sup>7</sup> Gray market parts that copy patented designs cost automakers and suppliers \$12 billion annually, according to the Motor & Equipment Manufacturers Association ([www.mema.org](http://www.mema.org)).
- <sup>8</sup> Like the TREAD Act in the US, Europe's ELV Directive extends OEMs' product liability — and the new responsibilities demand unprecedented amounts of product data. To acquire and maintain this data, OEMs need to create a unified vehicle record that tracks individual vehicles and even parts as they travel from cradle to grave to cradle again. See the September 12, 2003, Report “Recycling Recovers Auto Profits.”