Drowning Their Sorrows

ALAMY/ALBERTO PAREDES

THE DOWNBEAT MOOD AT THE FALL BUREAU OF INTERNATIONAL RECYCLING CONVENTION IN PRAGUE STEMMED FROM LOW COMMODITY PRICES, LOW SCRAP VOLUMES, AND CHINA'S ECONOMIC PROBLEMS, WHICH ARE DRAGGING DOWN METAL PRODUCTION IN THE UNITED STATES AND EUROPE. **BY RACHEL H. POLLACK**

A slower Chinese economy that's still producing metals, paper, and plastics at enormous volumes. Low primary metal and oil prices that are making scrap less competitive. Concerns about the cost and challenges of producing high-quality scrap. And a nagging feeling that calls for a "circular economy" will create more recycling mandates without any thought to market forces or feasibility. Those are some of the concerns the estimated 850 participants at the fall convention of the Bureau of International Recycling (Brussels) had on their minds during the meeting Oct. 26–27 in Prague.

The meeting's locale offered a few solaces, at least. Prague itself is a testament to survival despite difficult odds, lasting through more than a millennium of political, religious, and cultural upheaval—and, most recently, decades of Communist rule—to become a top tourist destination. And as one speaker noted, the Czech Republic consumes more beer per capita than any other country in the world—about 149 liters per person in 2012—so attendees had plenty of opportunities to commiserate over a few glasses.

NONFERROUS REFLECTS ON THE YEAR'S WOES

"The most pessimistic of bears couldn't foresee the constant downward spiral of 2015," **Nick Rose**, trading director of Tandom Metallurgical Group (Congleton, England), said of nonferrous recycling at that division's meeting. Since January, London Metal Exchange prices had fallen 14 percent for copper, 12 percent for aluminum, 9 percent for lead, 23 percent for zinc, and 35 percent for nickel, he said, "and the fears and uncertainties seem to be worldwide."

Rose did not attribute the hard times to any one event, naming China's slowing economy and devalued currency, the implementation of preshipment inspections in India, and low volumes and slowing orders in Europe. "Today's nonferrous industry faces diminishing margins, rising costs, [and] low confidence, and it will not be long until the banks become nervous," he warned.

Robert Stein, senior vice president of nonferrous marketing at Alter Trading Corp. (St. Louis), compared the conditions to a forest fire. The fire is "devastating [but] a necessary evil [to] regenerate flora and fauna." In the same way, current business conditions will result in the demise of some companies, he said, namely those that did not diversify their revenue streams, "but those with the foresight to survive will lead the industry into acceptable growth."

China is a different, safer market than it was in 2008 and 2009, Stein said, but it remains unpredictable because the Chinese government "implements policy [changes] with little or no notice." The slower Chinese economy and sometimes arduous Chinese regulations "have caused many to seek homes for their scrap elsewhere." A new concern he identified is Chinese aluminum producers falsely classifying shipments to the United States and Europe to avoid import taxes. "This violates Chinese law and hurts U.S. producers," he noted, calling on the U.S. and EU governments to take action accordingly.

At the Non-Ferrous Metals Division meeting, Robert Voss, formerly of Voss International, and Robert Stein of Alter Trading Corp. were recognized for their service to BIR and the scrap recycling industry over four decades. Both retired in 2015.

David Chiao, principal of Uni-All Group (Atlanta) and Non-Ferrous Metals Division president, recognized both Stein, a past president of the division, and **Robert Voss**, former principal of Voss International (Rickmansworth, England) and chairman of BIR's International Trade Council, on their retirement after four decades in the industry.

The nonferrous meeting's guest speakers addressed Poland's zinc and lead recycling. As recently as 10 years ago, Poland's zinc producers were using only primary zinc and discarding their residues, said **Marek Orlicz**, commercial director of primary and secondary zinc processor Metalco (Katowice, Poland). Now, with the help of university research, one plant's inputs are 60 percent scrap, another's are 30 percent scrap, and his company—Poland's largest zinc producer—uses nearly 80 percent scrap. Smelters "feel it's more profitable," he said.

Marek Orlicz

Orlicz said he expects the scrap ratio—and the production of secondary zinc products—in Poland to grow, in part because Poland has the only zinc smelter in Europe that uses the imperial smelting process, which can handle difficult zinc oxide wastes. To find enough zinc scrap to cover this rising production, Poland has started to import from North and South America, the Middle East, South Africa, and the Baltic countries.

Marek Zelazny, commercial director of lead battery processor Baterpol (Katowice), traced the history of lead smelting from the ancient Egyptians through the Middle Ages—when Poland became the center of European lead production—to today. In addition to recycling lead batteries, his company produces alloys and other lead products.

Marek Zelazny

China dominates the world's overall and primary lead production as well as lead use, Zelazny said. Most secondary lead comes from used lead-acid batteries, which by weight are 50 percent lead paste, 26 percent metal connectors, 14 percent electrolyte, 6 percent PE, and 4 percent PET. Everything but the PET gets recycled, he noted. Like Orlicz, Zelazny said sourcing raw material is a major concern, taking up 75 percent of his time compared with 25 percent spent on sales.

FERROUS FOCUSES ON CHINESE DUMPING

Ferrous Division speakers blamed that sector's woes on the Chinese steel industry dumping low-priced finished and semifinished steel on the rest of the world. China is flooding the market with "billet exports … at ever-decreasing prices," said Ferrous Division President **Bill Schmiedel**, president of Sims Group Global Trade Corp. (New York). He also accused Chinese mills and exporters of manipulating boron and chromium levels in steel alloys to circumvent export duties and qualify

TOP CENTER, MARTIJN REINTJES; ALL OTHERS, RACHEL H. POLLACK

ELECTRONICS RECYCLERS FACE UPHILL IMAGE BATTLE

BIR's E-Scrap Committee devoted its meeting to a discussion moderated by **Martijn Reintjes**, chief editor of *Recycling International*.

Steve Wong of the China Scrap Plastics Association (Beijing) called the situation for Chinese electronics processors "complicated" due to Chinese government crackdowns on illegal or polluting recyclers, low scrap commodity and oil prices, and limited markets for electronics plastics. "When we recycle e-scrap, we always have more than half that we can't recycle or reuse, which adds to the cost," he explained, because the recovered plastics don't conform to European regulatory requirements. China also is losing business to neighboring countries, he added.

In the United States, some recyclers have focused too much on market share, said **Eric Harris**, ISRI's associate counsel and director of government and international affairs. "Recyclers are so desperate for supply they're overpaying for material." To succeed, he said, companies must do more than process scrap into salable commodities. Some are diversifying into refurbishment for reuse, data destruction, and other services for which they can charge.

European electronics recyclers are also seeing the value of diversifying, said **Thomas Papageorgiou**, compliance manager of Anamet Recycling Industry (Athens) and E-Scrap Committee chairman. Recyclers also must stay attuned to the evolving composition of electronic products, which are using less metal and more plastics. "We must turn to innovation to achieve sustainability," he said.

Much of the meeting addressed how the industry can respond to erroneous or misleading reports about the extent of illegal trade and processing of end-of-life electronics. Reintjes noted one report claims 85 percent of the developed world's "e-waste" ends up in Delhi, India. That's "simply not possible," said **Surendra Borad**, chairman of Gemini Corp. (Antwerp, Belgium), with India's strict customs regulations and inspections of incoming scrap shipments. He attributed the statements to "a problem of ignorance." Another report says two-thirds of Europe's end-of-life electronics are exported or "thrown into waste bins," a claim that's "wildly inaccurate," according to **Ross Bartley**, BIR's trade and environment director. BIR has challenged Interpol, the source of the report, about "fuzzy wording" that groups "recognized, permitted organizations" with illegal operators, he said.

The recycling industry has been "chasing good data" on global e-scrap processing and trade, Harris said. Collecting such data would be "a huge opportunity to [present] a better global picture." This is a "messaging issue" for the industry, said ISRI President **Robin Wiener**, and there's an opportunity and a need to "stand up and talk about the reality of the industry globally." The E-Scrap Committee is looking into how it might address this problem, Harris and Wiener said.

Recycling International **Chief Editor Martijn Reintjes (far right) moderated the E-Scrap Committee's roundtable discussion of issues in electronics recycling with panelists (from left) Steve Wong, China Scrap Plastics Association; Ross Bartley, BIR; Surendra Borad, Gemini Corp.; Thomas Papageorgiou, Anamet Recycling Industry; and Eric Harris, ISRI.**

for VAT rebates. **Tom Bird**, managing director of Mettalis Recycling (Sheffield, England), said Chinese mills and exporters are falsely declaring the amounts of such alloys for similar ends.

That dumping is the end result of many steps China's steel industry has taken to deal with the country's slower growth, environmental problems, and need to keep people employed, Schmiedel said. These steps are no longer working, however, and the industry is "hemorrhaging," he said, reportedly losing US$2.8 billion in the first eight months of 2015.

"Producing steel at the current rate and pricing it accordingly is simply not sustainable long term," Bird said. "There needs to be a significant reduction in production as well as cost-cutting measures." There are signs China is beginning to "address its business model," he said, and other countries are beginning to enact tariffs against Chinese billet.

In the European Union, markets

and prices for steel scrap and steel production levels have fallen in recent months, Bird said. The UK has seen steel mill closures and job losses, with rumors of more to come. "Demand for scrap has been curtailed significantly as a result," he said. Spanish and Italian steel producers are facing the same problems, and in Spain, some mills might temporarily halt production. The result is that across Europe, scrapyards are reporting a 30- to 40-percent decrease in scrap volume coming to their plants, he said. For the European Union to impose import duties on steel from China, EU countries must reach consensus, and decisionmakers must weigh the steel industry's problems against the "huge amount of Chinese investment in the European economy," he explained.

U.S. steel mill orders are down due to both competition from imports and slowing domestic demand for steel, and steel scrap prices were down $50 a ton in October as a result, Bird said. Yard inventories were still exceeding mill demand, but Bird suggested that slower volumes of incoming scrap and the onset of winter might soon make mills more concerned about getting a sufficient supply.

Japanese heavy-melting steel scrap hit its lowest export price in seven years before the price stabilized, Bird said. Japan's export volumes to date have not fallen compared with 2014 volumes, he noted, but it is selling into markets farther afield. With 50 percent of Chinese steel exports remaining in Asia, that region's other steelmakers are "struggling to compete, with reports of idling and closures," Bird said. Taiwan has reduced its purchases of U.S. scrap as much as 50 percent, he noted.

Russia's domestic steel market is "holding up a little better" than others, thus Bird said he expects Russia to consume more of its scrap domestically and export less. Ukraine, however, is experiencing 40 percent lower collections compared with 2014, with mills halting production and limited exports due to government quotas.

India and Pakistan were two bright spots, Bird said, showing "strong demand" for ferrous scrap recently. **Sunil Barthwal**, joint secretary of India's Ministry of Steel, took to the stage briefly to express high hopes for India's steelmaking potential. He predicted India would grow from consuming 60 kg of steel per capita annually to consuming the global average of roughly 220 kg per capita in the next five years. India now produces 80 million to 90 million mt of crude steel a year, he said, third after Japan and China, and it consumes 32 million mt of steel scrap, of which 5 million is imported. He expects scrap demand to rise to 56 million mt a year in the next 10 years, and steel scrap imports will reach 10 million mt a year by 2020.


Sunil Barthwal

Despite the ferrous market's depressed state, both Bird and Schmiedel were somewhat optimistic about 2016. As prices for ferrous scrap drop, they expect consumers to once again view it as a "reasonable, viable, and economic option," as Schmiedel put it. He also noted the "many positive global and local macro- [and] micro-economic indications that the market will become more liquid and efficient over the next few months."

Bird pointed out that the low volumes of incoming scrap means "there is very little overhang in the market, which can only help [price] levels" through the winter, when supply usually becomes tight. Further, many operators are "examining their cost structure, looking at their recycling techniques, and becoming more efficient … so they can operate profitably at this level," he said, adding "we have to focus on what we can control."

The division's statistics adviser, **Rolf Willeke**, quantified the state of the global steel industry with data from the first six months of 2015. Both steel scrap consumption and crude steel production are down in China, the United States, Japan, South Korea, and Turkey in the first half of 2015 compared with that period in 2014. The 28 European Union countries were up in both measures just 0.5 percent.

Turkey is still the world's top steel scrap importer, but it purchased nearly 13 percent less in this period. Notable changes in import volume occurred in South Korea, where steel scrap imports fell 35.5 percent, and India, where imports were up nearly 30 percent, reaching 3.2 million mt, second only to Turkey in the period. U.S. and EU steel scrap imports were each down roughly 12 percent, while China's were down 2.4 percent.

EU steel scrap exports also were down 12 percent in the January-to-June period, year on year. Turkey is still the primary destination for European steel scrap, but it took in about 13 percent less from that region. Willeke noted 81 percent more European steel scrap going to Pakistan, a total of 484,000 mt, in this period compared with 2014.

U.S. ferrous scrap exports were down about 9 percent, to 6.9 million mt, with wide swings in destinations and volumes compared with the first half of 2014: Buying more were Turkey, up 12 percent and still the top destination; India, up 85 percent; and Mexico, up 21 percent. Buying less were Taiwan, down about 19 percent; South Korea, down 43 percent; and Canada, down 23 percent. Canadian steel scrap exports were down 25 percent, with U.S. buying down 12 percent, Egypt down 66 percent, India up 32 percent, and Taiwan up 79 percent.

Japan exported about 11 percent more steel scrap in the first half of 2015 than in that period in 2014—a total of 4.14 million mt—with South Korea, its top destination, buying 22 percent less, Vietnam buying 91 percent more, and Taiwan's purchases from Japan more than tripling, up 201 percent.

Russian steel scrap exports were nearly unchanged, up just 0.8 percent. Ukrainian exports jumped 59 percent, however, to 739,000 mt, with it exporting 61 percent more to Turkey and 44 percent more to Moldova.

"Steel scrap export prices reflect the difficult market trend," Willeke pointed out, with European HMS 80/20 prices for sales to Turkey falling about 55 percent from September 2014 to September 2015, and U.S. HMS prices, FOB, falling 47 percent for West Coast exports and 50 percent for East Coast exports in that time period.

Putting these numbers in a longer-term perspective was guest speaker **Becky Hites**, president of Steel Insights (Douglasville, Ga.). Some economists believe world economies move not just in short cycles of growth and contraction, but also in "larger, longer" cycles of 25 to 40 years—called the K wave—with the growth side tied to some evolutionary change, she said. Information technology innovations may have instigated the most recent wave, she suggested.

Becky Hites

When the world's economies are growing in sync, commodity prices rise due to competition for supply; when that growth pressure comes off, prices fall, as happened in 2012. Further slowing or stalling of growth is possible, Hites warned, and the world financial system, while stronger than it was in 2008, is "not resilient enough for another downturn or another significant crash."

Macroeconomic events are creating headwinds that are making growth difficult, Hites said, as are "distractions" such as political instability in Ukraine and the Middle East, the immigration crisis in Europe, and even the Volkswagen emissions scandal.

Also causing economic weakness is the choppy nature of commodity markets, she said. Producers can't increase or decrease supply quickly

enough to meet changes in demand. She noted, however, that in steel manufacturing, the slowdown "doesn't impact all areas equally. … There are pockets of opportunity when you start going to look."

Hites echoed others at the convention who pointed out these difficulties stem, in part, from China's efforts to transition out of a manufacturing-based economy to a consumer-based economy. "The tide has turned, clearly, on accommodating policies for the steel industry" in China, she said.

Also working against U.S. steelmakers is the strong dollar, a result of the relatively strong U.S. economy. She predicted that finished steel prices "will go down to the clearing cost," which will be "painful for everybody but will clear the market of the excess supply." Prices can go "lower than you think," she said, suggesting that attendees should "plan for it to be worse. That's how your business survives."

Her recommendations for scrap companies were, first, mitigate risk by cutting costs where possible and using financial instruments to reduce market exposure. Second, adapt and look for new markets. "The world has changed," she said. "The decisions you make will have to be different, not business as usual. You need to be creative."

STAINLESS STRUGGLES WITH A NICKEL SURPLUS

2015 has been "one of the most challenging years to date" for stainless steel recyclers, according to **Joost Van Kleef**, commercial manager of KMR Stainless (Dordrecht, Netherlands) and chairman of BIR's Stainless Steel & Special Alloys Committee. Even though the European Union imposed anti-dumping duties on imports of certain stainless products from China and Taiwan, European crude stainless production still fell more than 5 percent, year on year, in the January-to-July period. Van Kleef blamed the drop on a still-high level of finished goods, imports from other countries, lower-than-expected demand, and weak raw material prices. He predicted an even steeper decline in production at the end of the year.


Joost Van Kleef

The "significant price declines" in all the elements in stainless steel "are not sustainable," Van Kleef said, "and the availability of stainless scrap will be duly influenced." He cautioned that at current price levels, neither primary nor secondary producers can operate profitably. Despite the decline in production, European demand for scrap "has remained strong," said **Jonathan Bower**, commercial director at ELG Haniel Metals (Sheffield, England), "which in turn has put pressure on supply chains." He agreed with Van Kleef that the price corrections to all stainless components and the falling price of stainless steel scrap "will further impact available quantities."

Mark Sellier, head of international trade for OneSteel Recycling Hong Kong, said the slowdown in China is "slower than expected," to the point that "continued demand in India" is now driving the Asian market. "While the whole world is facing a serious shortage of scrap, aggressive buying from Indian mills has put other Asian players under pressure to secure raw material in the region," he wrote in the *BIR World Mirror: Stainless Steel & Special Alloys*. **André Reinders**, managing director and head of sales of Nicrinox (Dubai, United Arab Emirates), also called India "a great marketplace for stainless steel scrap," noting that the country "will pay what it needs to get the quantity it needs to produce." Sellier noted, however, that even Indian mills had slowed in the past few weeks due to lower demand for finished stainless products

Across Asia, volatility in markets and in regional currency values are adding to the pressure on scrap supply and distorting scrap flows, Sellier wrote in the *Mirror*. With scrap generation down, "margins have totally vanished, leaving people frustrated and directionless." He hoped analysts' predictions of a nickel deficit in 2016 are correct, bringing an end to the "gloomy weather."

While major U.S. stainless-producing mills continue to purchase scrap on a monthly basis, they're beginning to buy less, observed **Barry Hunter**, president of Hunter Alloys (Boonton, N.J.), of the U.S. market. "Order books and margins remain a concern as imports and domestic competition vie for what limited sales there are." He voiced the opinion that "the emphasis is going to be on attainable sales [rather than] pricing."

He agreed with Sellier that the stainless scrap market "is influenced greatly today by the price of the Indian material," even though U.S. exports to India are low compared with those to other major markets. Such prices "are not allowing processors sufficient opportunity to lower their buying prices to bring in scrap with margins," he said.

Hunter saw what might be "a flicker of light at the end of the dark tunnel" in 22,000 mt of nickel coming off the LME at the beginning of October—the first response to the excess supply. It's "still a far cry from the 450,000 mt" of nickel stocks on the LME overall, however, he said. Bower agreed that high LME stocks "will continue to weigh heavily on this market" unless demand improves substantially or production cuts are announced. "A swift recovery in the LME nickel price now looks unlikely," he said, as 2015 will likely end with a small nickel surplus, not the deficit that had been forecast.

Reinders took the optimist's view, noting that with low prices for nickel, chrome, and iron, "stainless steel is becoming more affordable, and hopefully we'll have more production, which means we'll have more scrap."

Gerhard Pariser, director of market research at Heinz H. Pariser Alloy

Gerhard Pariser

Metals & Steel Market Research (Xanten, Germany), outlined the "pessimistic" market environment for stainless steel. U.S. manufacturing, which had surged in the first half of 2014, has "come down tremendously," he said. Commodity prices are down, and devaluation of the currencies of major primary nickel-producing countries is depressing nickel prices and putting scrap at a disadvantage compared with primary nickel.

Pariser expects stainless demand will end up higher in 2015 than in 2014, primarily due to demand growth in developing economies. China has grown from about 25 percent to 42 percent of world stainless demand, he said, replacing other markets. Has China reached its peak demand? That can depend on various economic and cultural factors, he said, suggesting two possible scenarios: Both show China's demand peaking in 2018–20, followed by either slow growth or stagnation. Depending on which scenario takes hold, global growth in stainless demand could range from 2.9 percent to 4.6 percent annually over the next 15 years—less than the 5.2 percent the market averaged from 1970 to 2014.

Nickel demand mirrors stainless use, Pariser said, but it's "a distorting mirror." China used 51 percent of the world's primary nickel in 2014, and it's the only country that expanded its nickel demand in the last decade, he said. But China uses nickel pig iron as its source of nickel, not stainless scrap like the rest of the world. The NPI market is "vague and hard to predict, even for analysts," he said, but he expects less NPI will be on the global market in the next three years due to low prices. He cautioned, however, that some Chinese mills that use NPI would have to overcome technical and equipment issues to replace it with stainless scrap.

Pariser had no good news on nickel supply, noting that no producers of primary nickel had cut production so far in 2015, nor are they planning to make cuts in 2016. Nickel stocks exceed demand by 2 million mt, and if that doesn't change, "it's going to weigh on prices," he said. With nickel's oversupply and low prices, "scrap availability has become rarer," and the value of the nickel units in scrap has increased to the point that stainless producers are looking to use more ferronickel units to compensate.

Despite the weight of such pressures on the market, Pariser predicted 3- to 3.5-percent growth in stainless output globally in 2016—that's if China's output grows 5 percent, he noted, which is not a question of capacity but of domestic and export demand.

The difference between surplus and deficit for the nickel market is "tiny," Pariser said, thus he expects it to balance in 2016 and tip over into deficit in 2017. That won't happen, however, if Indonesia ramps up its NPI production, if more stainless scrap becomes available and used, if stainless use slips, or if nickel stocks decline. On the other hand, if China has less NPI on hand than expected, and if stainless demand grows, the market could go into deficit sooner.

PLASTICS COMMITTEE SEES OPPORTUNITY IN THE CLOUDS

Like other commodities, plastic scrap is on a downward trend for volume, prices, and confidence, said **Surendra Borad**, chairman of Gemini Corp. (Antwerp, Belgium) and of BIR's Plastics Committee. Still, at the committee's meeting he named three "silver linings" in these clouds: First, the sharp decline in sea freight prices—down almost 40 percent since May—creates a lot of "opportunities for geographical arbitrage" and conducting business in countries where it previously was not feasible. Second, "the quality of scrap has improved tremendously" thanks to new technologies. Third, there is "increasing pressure on consumer product companies to use recycled materials," he said.

In China, the plastics recycling industry is facing major challenges, with prices dropping more than 50 percent from January to September for some plastics, said **Steve Wong**, managing director of Fukutomi Co. (Hong Kong) and chair of the China Scrap Plastics Association (Beijing). He attributed the price declines to slow domestic and export demand, low liquidity, low oil prices, and a Chinese government crackdown on recyclers without processing licenses or proper water treatment systems. Demand for engineering plastics has fallen as the manufacturing of those plastics has moved to other countries in Southeast Asia, Wong said, and the PET market has been oversupplied for the past few years, resulting in prices dropping more than half since 2013.


Steve Wong

"For those people who can struggle and be able to survive through this crisis, there is lots of opportunity," Wong said, but not with traditional methods of hand sorting. Technology and automation will be essential for making China's production costs competitive again with other developing countries, he asserted.

Borad confirmed Wong's report of low exports of plastic scrap to China, noting that China Inspection and Quarantine Service figures indicate plastic imports into China are down about 20 percent for the January-to-June period in 2015 compared with 2014. He expects the downward trend to continue, especially in light of reports from the Los Angeles office of the China Certification and Inspection Group that China might ban imports of some types and grades of plastic scrap in "two or three months."

In the United States, while PE prices are stable, non-PE plastics prices have fallen more than 50 percent in the last four months, and there are "no buyers even at those low prices," Borad said. U.S. exports of plastic scrap to China in August were down 42 percent compared with August 2014, with the largest drop being PET scrap exports, which were down 55 percent in that period. "The near-term situation does not look very promising" for U.S. exports, he said, "but the domestic [U.S.] market is reasonably stable, and there's a regular market for the materials."

India "continues to surprise the plastic scrap market with awkward proposals," Borad said, contrasting the perspective of the European Commission, which may be initiating the end-of-waste process for plastic scrap, with that of the Indian government, which recently proposed declaring plastic scrap a hazardous material. That proposal was withdrawn due to complaints from various parties, including BIR, he noted. Despite that challenge, the Indian plastic scrap market has been stable. The quantities of plastic scrap India imports are low compared with China, Borad said, because only 30 companies have licenses to import scrap, India has not issued any new licenses for almost 15 years, and the renewal of existing licenses depends on the companies' fulfilling certain export obligations.

In a report from Europe submitted by **Marc-Antoine Belthé**, recycling director of Veolia Environmental Services France (Paris), he noted dramatic declines in PET bale prices, which fell 80 euros a metric ton from September to October. Customers are taking a "wait-and-see" approach and don't want to take risks without a clear view of the market situation, he added.

With the European Union's mandate that recyclers find beneficial uses for 85 percent of end-of-life vehicles and the proportion of plastic in a car increasing, European recyclers are focused more than ever on how to recover plastics from automobile shredder residue. **Manuel Bernand**,

IEC RAISES CIRCULAR ECONOMY CONCERNS

"The linear economy as we know it today is not sustainable," said **Emmanuel Katrakis**, secretary general of the European Recycling Industries' Confederation, or EuRIC (Brussels), at the BIR International Environmental Council meeting. Thus, "policymakers are looking for ways to combine economic and environmental agendas"—creating what the European Union is calling the circular economy. But European recyclers are concerned about how circular economy plans will affect the business of recycling.

Emmanuel Katrakis

EuRIC was established in fall 2014 to represent European recyclers' interests to the EU, Katrakis explained. Members include the European Ferrous Recovery and Recycling Federation, European Recovered Paper Association, and the European Metal Trade and Recycling Federation (all in Brussels), as well as national recycling associations and companies in 19 European countries. EuRIC's goal is a market-driven circular economy emphasizing that waste is a resource, Katrakis said, and he outlined its specific objectives to achieve that vision through regulatory changes, harmonized recycling targets, and approaches that ensure "a level playing field between public and private" recycling entities and free and fair international trade of scrap commodities.

Olivier François of Galloo Recycling (Menen, Belgium), IEC chairman, told of a European Commission meeting on the circular economy in June 2015, where one speaker took what he called a "radical" position that recycled commodities must have zero levels of chemicals now identified as persistent organic pollutants, or POPs. These chemicals have since been banned or restricted, but when "you recycle old material in old equipment, there are always traces of many pollutants," François said. "We know as engineers that we cannot reach [zero]. … It's absolutely impossible." He questioned how such an outcome would even be measured. The proposal "is not compatible with an industrial activity [such as] recycling," he asserted, thus it could be "a big problem" for the recycling industry.

Olivier François

Presenting the environmentalists' perspective was **Jindřich Petrlik**, executive director of the toxics and waste program at Arnika (Prague), a Czech environmental group, and a representative of the International Persistent Organic Pollutants Elimination Network, or IPEN. The Stockholm Convention, an international treaty that took effect in 2004, bans or limits the use of POPs because they bioaccumulate and pose a risk to human health and the environment, he said. POPs include dioxins, brominated flame retardants, polychlorinated biphenyls, and chlorinated pesticides. IPEN contends that recycling is keeping POP-containing materials in use worldwide, and the level at which the convention declared such materials safe is not safe. He singled out plastics from end-of-life electronics as a concern because the plastics often contain brominated flame retardants. IPEN "found significant levels of these pollutants in carpet padding and children's toys," he said. Its research on Rubik's Cubes manufactured in China and sold in Europe found a range of POP levels, some of which exceeded the limits. Petrlik advocates banning POPs from children's toys, lowering allowed POP levels in the Stockholm Convention, and controlling exports of electronics plastics through the Basel Convention on the transboundary movement of hazardous wastes.

Jindřich Petrlik

Jaromír Manhart, director of the waste management department of the Czech Republic's Ministry of the Environment (Prague), told IEC meeting attendees about his country's circular economy plans. The Czech waste management plan adopted in 2014 for years 2015–2024 mandates separate collection of municipal paper, plastic, glass, metal, and "bio-waste." As of 2024, the plan bans landfilling mixed municipal waste, recyclables, and "recoverable waste." Funding will come in part from doubling landfill taxes, he said.

Jaromír Manhart

In 2014, about 80 percent of the Czech Republic's 30 million mt of "production wastes" was recovered for recycling and 3.5 percent was incinerated for energy recovery, he said. In contrast, only 35 percent of the 5.3 million mt of household waste was recovered for recycling and 12 percent was used for energy recovery, leaving nearly half to be landfilled. Although the EU target is for member states to reach 50-percent recovery of municipal wastes by 2020, the Czech goal is 60 percent by 2024, he said.

Ross Bartley, BIR's trade and environment director, updated IEC attendees on the bureau's participation in a wide range of international initiatives, including those on controlling orphan sources of radiation that turn up in scrap, extended producer responsibility guidelines, public-private partnerships in waste collection, and UN sustainable development goals.

BIR and ISRI's work on the Basel Convention lately has focused on its glossary of terms such as waste, nonwaste, hazardous waste, reuse, refurbishment, secondhand goods, and end-of-life goods. Some terms in the agreement have legal ramifications, Bartley noted, so it's "quite important we understand what we're talking about."

Eric Harris, ISRI's associate counsel and director of government and international affairs, spoke briefly about ISRI's and BIR's work on the World Trade Organization environmental goods agreement. Their goal is to have the agreement reduce tariffs and nontariff barriers on secondary raw materials and recycling equipment. He noted the involvement of **Tracy Shaw**, president and CEO of the Canadian Association of Recycling Industries (Ottawa), in the WTO work as well.

director of environment and development of Derichebourg (Paris) and recently appointed chairman of BIR's Shredder Committee, said recent research has found that separating the plastics is "technically difficult" and requires significant investment in advanced technology. The plastic fragments are similar in density and appearance to each other and to wood, rubber, and foam fragments, as well as to other materials that go through an automobile shredder. Thus, "plastic recycling from ASR may be limited due to complexity" until new technologies are developed, he said.


Manuel Bernand

Auto manufacturers' increasing use of plastics "shifts the environmental burden" to recyclers, Borad said. He pointed out that some automotive plastics are thermosets, which are not recyclable; other parts contain combinations of thermosets and thermoplastics or more than one thermoplastic; and still other plastic parts have contaminants. "What is technically recyclable may not be practically feasible in reality," he said. He called for better knowledge transfer from manufacturers to recyclers and better "design for resource efficiency." Still, the great volume of automotive plastics could create "tremendous opportunities," he added.

In some good news for this industry sector, researchers at the Copernicus Institute of Sustainable Development at the University of Utrecht in the Netherlands investigated whether manufacturing a product with recycled PET fiber is better for the environment than using virgin PET fiber. Assistant Professor **Li Shen** explained that three different approaches to life-cycle assessment all found that recycled PET fiber saves resources compared with virgin PET fiber.


Li Shen

QUALITY, MARKET CHANGES CONCERN PAPER

Changes in the recovered paper mix and higher quality requirements were trends on the mind of **Reinhold Schmidt**, managing partner of Recycling Karla Schmidt (Haren, Germany) and president of the Paper Division. Quality regulations must be "practical" and "part and parcel of our everyday work," he said. One problem, for example, is that Europe's EN643 standard for recovered paper sets a 10-percent limit for moisture content, but the industry does not have the methods or technology to achieve that, he said.

Across Europe, domestic demand and prices for recovered paper have been healthy. **Dominique Maguin**, chairman and CEO of La Compagnie des Matières Premières (Paris), described the French recovered paper market as "a good vintage" in 2015 to date, with consistent prices that are higher than 2014. Recently, producer stocks had risen and fiber prices had fallen, however, he said. Germany, the United Kingdom, and Spain report higher quality requirements from recovered paper consumers, he added. **Merja Helander**, fiber recycling business director of Lassila & Tinkanoja (Helsinki), described Finland's market as "reasonably well-balanced," although a new producer-responsibility law for board packaging will affect collection practices and increase costs for packaging producers, she said.

The Czech Republic's growing economy is helping its recovered paper industry, said **Lars-Gunnar Almryd** of IL Recycling (Solna, Sweden). Collections are up 20 percent; exports, 23 percent; and recovered paper consumption, 20 percent in the first half of 2015 compared with that period in 2014.

Helander's report from the European Recovered Paper Association (Brussels) confirmed that members are experiencing "favorable price development and stable demand" since the spring 2015 BIR meeting in Dubai. In 2014 the European recycling rate reached 71.7 percent, "a record high and the best in the world," she said. Of the 58 million mt collected, 8.6 million was exported outside of Europe.

She cautioned that "paper fiber is shortening and becoming weaker." European paper can be reused 3.5 times on average, she said, which is higher than the global average of 2.4 times, but half its life span just 15 or 20 years ago. Also, more paper consumed in Europe cannot be collected for recycling, she said. ERPA planned to issue the fourth European Declaration on Paper Recycling, which will cover 2016 to 2020 and set a new voluntary recycling rate target, by the end of 2015, she said.

Despite the relative good news in Europe, Maguin reiterated earlier warnings from **Ranjit Baxi**, BIR president and founder and president of J&H Sales International (London), about a long-term market imbalance because Europe collects more recovered paper than it consumes. We "have been thinking for years that China will be the solution" to this imbalance, he said. "Now we have a slowdown of demand in China, and we can see that our economies can be affected. So we are pushing [for] new markets."

In his remarks, Baxi contrasted "the China we have known," with double-digit annual economic growth and a "voracious appetite for raw materials," with "the China we see today," with a shrinking manufacturing sector and estimated 6.9-percent GDP growth for 2015—which is still stronger than that of most Western economies, he noted. The continued growth is not in manufacturing, however, but in the service sector. Baxi said he believes consumer use of services "will transform into demand for goods as the economy starts improving. So I see the future [is] not so bleak from China." Even so, he warned that China's growing domestic paper collection, higher quality standards, and environmental controls that result in the shutdown of small, polluting mills might reduce demand for imported paper.

In the first three quarters of 2015, China imported 1.09 million mt more recovered paper than it did in that period in 2014, he said, estimating full-year 2015 import levels will equal 2011. In the first eight months of 2015, Chinese imports from North America are roughly even with those 2014, whereas imports from Europe are up 786,753 mt. This "does not mean America's appetite for export has died down," Baxi noted. Instead, "American domestic demand has been very strong [because] the American economy is doing well." Further, he credited low sea freight prices and low oil prices for supporting European paper exports.

Jaroslav Tymich, executive and managing director of Euro Waste (Steti, Czech Republic) and vice president of the country's Association of the Pulp and Paper Industry (Steti), presented a detailed analysis of paper and board consumption, recycling rates, and the collection of paper for recycling within Eastern Europe and several subregions. The trends in Eastern Europe mirror those in the rest of Europe and globally, he said, with growth in packaging production and paper collection and a decline in graphic paper consumption. Russia had stopped exporting recovered paper three months earlier, he noted, which is putting pressure on Romania and affecting Hungary and Poland.


Jaroslav Tymich

Tymich started his remarks by saying—perhaps jokingly—that the European paper industry "would like to keep our paper in Europe, to have enough recovered paper—[a] big supply—and lower prices." During the question-and-answer period, Maguin gave a spirited response, pointing out that paper recyclers "need to earn money in order to run our companies."

"The group of companies I'm working with, Paprec [Group], has invested roughly 1 billion euros over the last 20 years to produce 1 billion tons of paper," Maguin said, adding "it's very expensive" to produce recovered paper that meets European mills' quality standards.

Balázs Makó, CEO of Paper Metal Recycling (Debrecen, Hungary), a second guest speaker, described the history of paper collection in Hungary. The public collection system became private in the 1990s and changed again in 2001 and 2012 with the passage of new waste laws, he said. With Hungary having only one paper mill, nonpaper uses of recovered fiber and mills in nearby Austria and Slovenia are important markets. The country's challenges include insufficient incentives to collect recovered paper and insufficient collection points, he said.


Balázs Makó

TIRE RECYCLERS WORRY ABOUT MARKET BARRIERS

Markets for Europe's end-of-life tires have not grown much recently, which is "something to worry about," said **Fazilet Cinaralp**, secretary general of the European Tyre and Rubber Manufacturers Association (Brussels), at the Tyres & Rubber Committee meeting. She added that growth primarily has been in energy recovery, not material recovery. Each of those two categories comprises 38 percent of Europe's ELT market, said **Valerie Shulman**, secretary general of the European Tyre Recycling Association (Brussels). The overall tire recovery rate (for all uses) has fallen recently from 90 percent to 81 percent, Shulman said, due to less retreading, which fell from 12 percent to 6.5 percent of the market. ETRA has been working to improve data collection across Europe, she said, most notably by accurately counting off-the-road tires and the growing quantity of imported tires. Europe generated about 3.2 million mt of end-of-life tires in 2014, of which more than 100,000 mt was OTR tires, she said.


Fazilet Cinaralp


Valerie Shulman

One market, crumb rubber infill for synthetic turf fields, is facing scrutiny, Cinaralp said, in part due to questions about whether it meets the European Commission's new standard, which took effect in December, limiting levels of polycyclic aromatic hydrocarbons in consumer products. Countries are banning the material "without any demonstration" of it causing harm, she said. Studies to date "can't find any scientific evidence of health concern [or] significant health effects of playing on the surfaces." Infill and sport and playground surfaces combined are 54 percent of the European granulate market, she said, but infill's share of the granulate and powder market has fallen from 43 percent in 2011 to 30 percent in 2014.

Cinaralp recommended that Europe balance its circular economy goals and environmental goals, keep end-of-life tires outside the category of municipal waste, change regulations to better promote retreading as a viable reuse option, aim for a "balanced portfolio" of recovery technologies, and develop new markets for end-of-life tires, in part through mandatory "green" public procurement schemes, she said. She also called for more cooperation on the development of industry standards.


Ruud Burlet

The elements of success for tire recycling—markets, raw materials, and processing capacity—have not changed in the past decade, said **Ruud Burlet**, marketing director of Rubber Resources (Maastricht, Netherlands) and committee chairman. To advance the industry further, each element also

BIR PRAGUE REPORT

needs dedicated money, research, and government assistance, he said. He emphasized the importance of money versus "green feeling," the need for recyclers and tire manufacturers to speak with one voice before government bodies, the efficiencies created from industry consolidation, and the value of ETRA in addressing barriers to progress.

Wilma Dierkes, an associate professor in the elastomer technology and engineering group at the Netherlands' University of Twente, spoke about devulcanization, which she called the only "cradle-to-cradle" tire processing approach. Pointing out the limitations of other processing methods, she said granulation results in rubber contaminated with other tire components. The finer the processing, the greater its purity, but costs increase exponentially as well. Pyrolysis also is problematic, she said, because it produces contaminated char and oil, and the cost of processing might exceed the value of the products. Devulcanization, though more expensive than granulation, turns tires from "chewing gum [back] into tire material," she said. Devulcanized tire rubber is "smooth material, it blends well with new material, the polymer is intact, [and] it's similar to virgin feedstock" in terms of properties such as tensile strength and elongation.


Wilma Dierkes

The biggest challenges for devulcanization, Dierkes said, are that the process requires a "devulcanization aid, which is smelly, and … an oxygen-free atmosphere." Other challenges are contaminants in the tire; the variety of polymers, fillers, and curing agents in tires; and the aging of the tire material during its first life. But she believes the technology offers the best potential and feasibility for turning scrap tires back into new tires.

Rachel H. Pollack is editor-in-chief of Scrap.