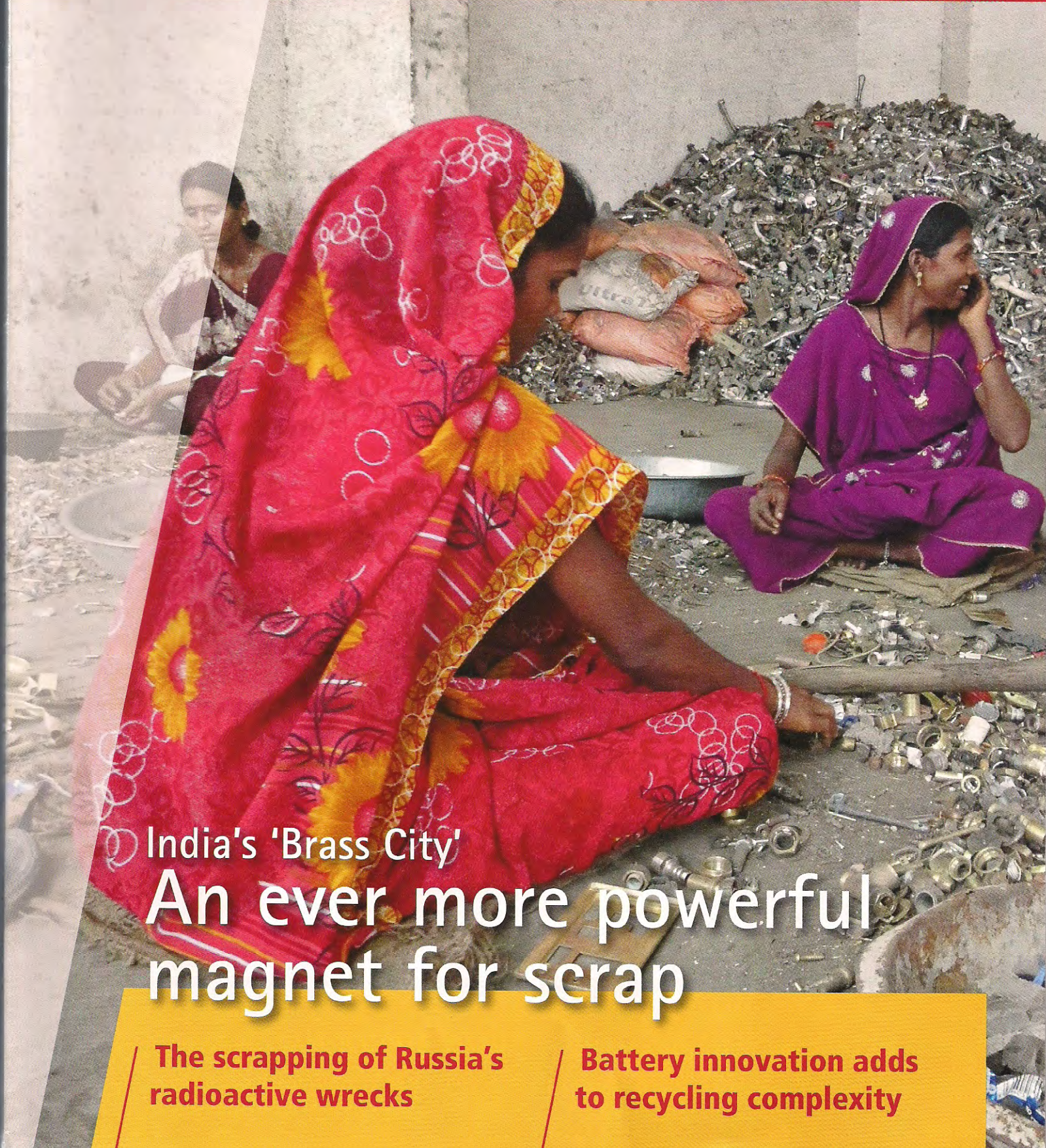




# Recycling

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India's 'Brass City'

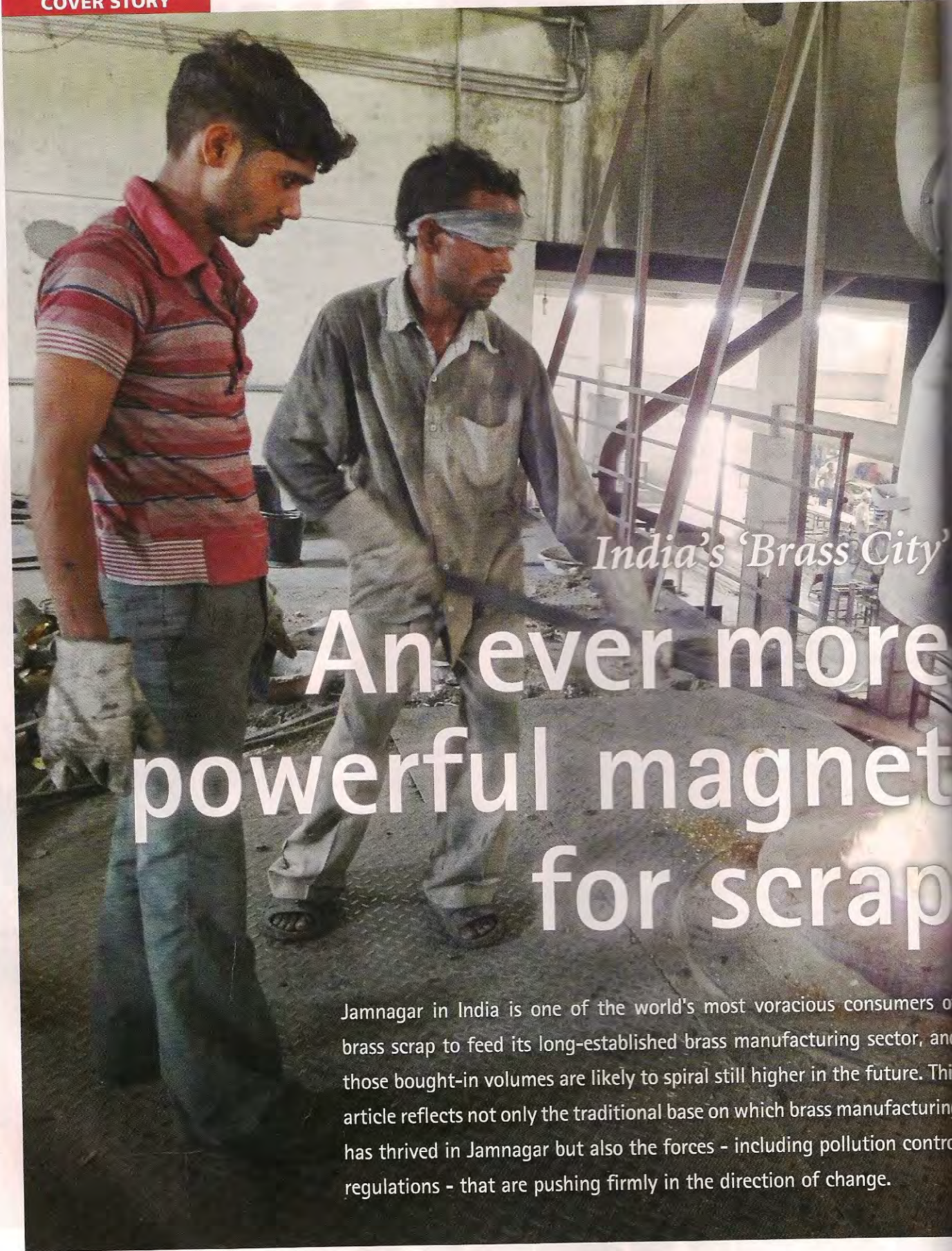
## An ever more powerful magnet for scrap

**The scrapping of Russia's radioactive wrecks**

**Battery innovation adds to recycling complexity**



COVER STORY



*India's 'Brass City'*

# An ever more powerful magnet for scrap

Jamnagar in India is one of the world's most voracious consumers of brass scrap to feed its long-established brass manufacturing sector, and those bought-in volumes are likely to spiral still higher in the future. This article reflects not only the traditional base on which brass manufacturing has thrived in Jamnagar but also the forces - including pollution control regulations - that are pushing firmly in the direction of change.



Sometimes progress requires a jump-start, and in the case of India's low-profile non-ferrous scrap business, it requires someone like Sunil Pachmatia, Sales Manager and shareholder in family-owned Pooja Metal Industries which is based in India's 'Brass City'.

For ten minutes he's been watching a hired driver try to extricate a truck and trailer containing a 20-tonne load of prime Middle Eastern brass scrap from the mud in front of the company's driveway. Finally running out of patience, he walks to the front of rickety old delivery truck, kicks the driver out of the cab and jams it into gear. The wheels spin, the mud flies and soon the trailer is backing through the loading doors of Pooja's small warehouse where workers will unload it by hand and shovel.

Though little known outside of India and the brass scrap trade, 'Brass City' - better known as Jamnagar - is one of the world's leading consumers of brass scrap. Located in north-west India in the economically dynamic state of Gujarat, it is poised to become something much bigger and more important. Its 3000-4000 brass enterprises employ in excess of 150 000 people and are responsible for importing (depending upon season and economic conditions) up to 4000 containers per month of Honey brass through nearby ports.

### Brass-making heart of India

According to the source of these figures Kanti Joshi, Director and owner of Mascot Metal Traders and President of the Jamnagar Exim Metal Merchant Association, Jamnagar's import volumes account for at least one third of India's total brass scrap imports. And that's not the only source of Jamnagar's scrap: another 20% is sourced domestically. Precise figures, however, are hard to come by.

Still, it doesn't take long for the casual visitor to understand that this modest city, surrounded by farm fields transforming rapidly into industrial zones and housing projects, is at the heart of India's brass-making universe. A bumpy ride through one of the city's many industrial zones reveals a seemingly uncountable number of small foundries, scrap warehouses and casting operations. Mr Joshi, who is Jamnagar's first and only BIR member, tells me that I'm 'wearing Jamnagar' and points at my shoelace loops, my belt buckle and the clip on my pen as likely Jamnagar products. It's no exaggeration either: Jamnagar is the



A woman is carrying out spark tests on old taps.



Cheap labour, limited regulation and developing country entrepreneurial know-how have long been keys to Jamnagar's low-profile success.

world's go-to source for easy-to-overlook brass items. For example, its roughly 15 brass bicycle air valve manufacturers supply much of Asia - and thus the world - with the means to fill tyres by air. One factory alone supplies 2 million valves per month - manufactured from imported Honey scrap - to tyre manufacturers elsewhere in India, who ship to Asia and the world. And that's just one item that the city's thousands of manufacturers build better, cheaper and in greater quantities than anywhere else: ballpoint pen tips, plumbing components and belt buckles are others.

*'I was paid with a sandwich and two coffees per day.'*

### Steady scrap import growth

Cheap labour, limited regulation and developing country entrepreneurial know-how have long been keys to Jamnagar's low-profile success. But as India's domestic economy grows, environmental awareness heightens and demand for quality increases, Jamnagar's formula for success is changing. Extrusion plants are replacing sand-casting; electric furnaces are

replacing coal-fired ones; and scrap imports, the only source of high-quality scrap, are growing steadily but surely.

One of the developing world's oldest clichés says it best: economies don't develop from the top down; they develop from the bottom up, utilising the lowest-cost labour and manufacturing available until they can afford to do better. And Jamnagar, just like India, is about to do much, much better.

Ask the average Jamnagar brass man how the city came to be known as 'Brass City' and you're likely to get a circular answer like 'brass has always been here'. Mr Joshi, an armchair historian of Jamnagar's brass trade, can't pin an exact date on the trade's origins but rather prefers to tell me that a relatively temperate climate 'is suitable for casting brass' and that some of the original casting shops were founded by migrants from other Indian states familiar with steel-casting techniques.

Beyond that, he's content to point out that the city's workforce is inexpensive and experienced. 'They are born in India, so they are practical,' he explains. 'After generations of doing this work in Jamnagar, they can do it better than anyone.' He reckons there are 700 smelters in town, most of them small-scale, producing for thousands of small manufacturers with expertise unrivalled anywhere in the world.

### Quickly occupied

Mr Pachmatia speeds his SUV down two-lane highways and on to the muddy dirt roads that wind through hundreds of warehouses and workshops that house brass factories. Gujarat Industrial Development Corporation Zone 2 (GIDC2) is a sprawling industrial park laid out a decade ago and quickly occupied by the region's brass factories.

I notice alongside the muddy trail a gaunt labourer seated outside a small workshop, rapidly turning the handle on a mixer-sized smelter, blowing air on a few pieces of coal that heat up a thumb-sized casting so that it can be machined. 'There are lots of shops like this one,' he tells me. 'They probably do maintenance work for small manufacturers.'

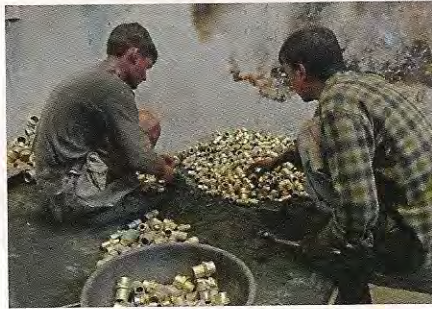
Further up the road, we stop at the slightly larger warehouse owned by Bajrang Brass Industries. Inside, 10 workers paid the Jamnagar rate of US\$ 60-80 per month are busy machining brass rods into electrical components. The rods themselves were smelted ear-



lier in the day in a small dark room behind the machine shop where a brick-lined hole in the ground serves as the company's coal-fired furnace. A pile of scrap containing plumbing fixtures, stripped copper wire and a few stray electrical parts stands ready to be melted in tomorrow morning's heat. The scrap was purchased from a larger processor who may or may not have been responsible for importing it to Jamnagar. 'Sometimes metal moves around a lot before the foundry,' Mr Pachmatia tells me. 'But the material is definitely imported.' On average, Bajrang Brass Industries goes through 10-12 tonnes of Honey per month. Hement Gokani, the 37-year-old founder and owner of the company, tells me that he started as a labourer. It's a rare feat: by his estimate, only two out of 500 labourers 'get this far'. As Jamnagar lifestyles go, it's not bad: he has a car, a house and enough money to send his children to school. 'I'm content,' he declares. 'I don't need anything else.' To finance that lifestyle, he manufactures 1500 kg of brass rod per day, some of which he sells and some of which he manufactures into 500 kg of electrical components sold into local markets.

### Domestically driven

Across town, Mr Pachmatia introduces me to Ramgopal Maheshwari, Managing Director of Siyaram Metal Udyog - Jamnagar's biggest importer of scrap metal and one of the largest sources of scrap for the hundreds of small smelters that can't import on their own. On average, Mr Maheshwari tells me, he trades 1500 tonnes of imported non-ferrous per month, including Honey, zinc and copper. His father started the company in 1978 as a small foundry and domestic trading business with 50 tonnes of volume per month. Now aged 46, Mr Maheshwari worked as a teenager during the company's 'struggle' years and now watches over a customer base that includes hundreds of Jamnagar buyers as well as a wide range of clients for the company's alloys in Eastern Europe and China. But unlike China and its scrap businesses, which largely grew on the basis of exports and infrastructure, India's economy is domestically driven. 'Consumer demand is growing within India,' Mr Maheshwari tells me. 'So that's the growth around here for scrap. During the economic crisis, we hardly felt anything. Gujarat and Jamnagar stayed strong.'



After the castings are poured and cooled, workers knock new brass pipe fittings from the cases.



A small open furnace at Jai Varudi Enterprises.



Unloading a trailer containing a 20-tonne load of prime Middle Eastern brass scrap.

### Agents all over the world

We drive back to GIDC2 and he leads me round sorting spaces filled with Honey scrap and female sorters in bright saris, working through the piles. As I walk through a zinc scrap storage

## 'You're wearing Jamnagar.'

and sorting area, I pass a woman doing spark tests on old taps that she places against a polishing wheel covered in sandpaper.

Mr Maheshwari's material is all imported, much of it from Europe's and the Middle East's best-known scrap exporters. 'I have agents all over the world, most in Europe,' he explains. 'But the problem now is that European quality is declining. I even found 150 bags of sand in one load recently.'

In general, Mr Maheshwari and his customers prefer North American scrap, both for its quality and exporters. But North American material is expensive, the shipping times are long (and risky during uncertain markets), and payment terms are difficult for Indian traders who prefer to make 20% down-payments with the rest due upon delivery. As a result, Mr Maheshwari and Mr Pachmatia are focused on scrap markets in the United Arab Emirates (UAE): the close proximity, lower prices and shorter shipping times make it an easy place for them to buy and speculate.

### Good opportunity

GIDC1 is Jamnagar's oldest industrial park and the one closest to downtown. It is also full: more than 1100 brass operations occupy it. Late one morning, as I walk along the muddy streets lined by room-sized workshop after room-sized workshop, Pravinbhai Timbadia, the 42-year-old owner of Jai Varudi Enterprises, beckons me to enter his stifling hot and dark foundry. Jai Varudi occupies an uncomfortably cramped but very, very active space where 20 workers slip out of sandals to pack sand onto casts that are stacked and filled - by ladle - with hot brass from an open furnace which emits smoke, unvented and unfiltered. Mr Timbadia tells me that his plant has four heats of 300 kg per day, all fed with imported Honey scrap that he buys, sorted, from local traders. He produces nothing but small rods which he sells to small manufacturers. In total, he clears US\$ 2000 a month. As I share a drink with him at a desk serving as his office on the edge of the furnace, he tells me that, in the next month, he is travelling to Portland in the USA to meet his cousin - the owner of a Dunkin' Donuts franchise - in the hope of starting a scrap business focused on exporting to India. 'I think there's a good opportunity,' he tells me. 'Jamnagar needs more and more scrap.'

### No formal training

Sunil Panchmatiya's thoughtful, soft-spoken older brother Anil starts his working day by waving a few sticks on incense gently through his



office, his eyes focused on the small god perched above windows that face the 20 000-square-foot Pooja Metals facility. He worked in real estate for years before starting a small trading office with his brother in 1988 which focused on selling Jamnagar's brass components to companies in Mumbai and other Indian cities. It was enough of an opportunity that, in 1991, they started a casting plant. And in 1993, they opened a foundry producing 1 tonne per day of brass components from scrap.

Like so many of Jamnagar's brass men (and they are nearly all men), Anil had no formal training in smelting or casting but learned along the way, sometimes from friends in the business and sometimes from consultants. In time, he became the Managing Director, and Sunil became the Import & Export Director. Spying greater opportunities and easier trades, Anil began exporting the company's products in the mid-1990s; and in 1997, after having reached such a scale that he could afford to import, bought his first load of scrap from Turkey.

Today, Anil watches over the Jamnagar operations while Sunil spends most of his time in Dubai where he markets Pooja's high-quality components and those of other Indian manufacturers while at the same time managing the export of 20-25 containers of brass and other scrap per month through Prime Impex, his new Dubai-based trading company. 'This factory needs 125 tonnes per month of brass Honey,' Anil says. 'And we import another container of zinc scrap as well.' The rest of the scrap he imports as an agent for others.

#### Pollution directives

Across from the offices, men and women are seated on a warehouse floor sorting a recently-arrived load of Honey; they are quick workers, hired on a temporary basis when needed for sorting. On the other side of a concrete wall, the sorted brass is piled up near the open furnace dug into the floor. However, unlike the smaller Jamnagar furnaces Sunil has shown me, Pooja's is outfitted with a venting system that feeds into a bag house. The equipment is a new development, enforced across Jamnagar in the last two to three years by local and national pollution directives that seek to clean up what most of the brass men appear to concede is a polluting business. It's not an expensive development and the Pachmatia brothers, like most mid- to large-sized traders in Jamnagar, are supportive of it.



Shree Bhavani Extrusion produces extruded rods in different sizes.



Small bales of domestically-sourced brass oil cans.

At a minimum, the pollution equipment differentiates their business from the many small, polluting manufacturers who can't afford it and who therefore might not be able to survive in a few years from now.

*'Jamnagar is going to be a mega-city.'*

#### Hand-made quality

Pollution control is new to Jamnagar. What's not new, and won't change, is manual labour. At Pooja, the workers sort the scrap, hand-load it into the furnace and then use their bare feet to pack sand into moulds. After the castings are poured and cooled, these same workers knock new brass pipe fittings from the cases. It's

admittedly low-tech, but the Pachmatias and other Jamnagar businessmen insist that superb hand-made quality is the result. And quality, I'm told, is what differentiates Jamnagar from China's brass manufacturers.

Sunil tells me that his customers in Dubai complain about the high zinc content in Chinese brass plumbing fixtures. 'We don't do that in Jamnagar,' he insists. 'That's not how we compete.' But Chinese competition is on the mind of Jamnagar's brass industry; it may have had a head start, I'm told, but Jamnagar's commitment to better-quality alloys and craft is giving the city - and India - a slowly evolving step-up in international markets. 'Nobody can compete with our quality,' Anil asserts.

Across from the smelting and sorting warehouse is another furnace and, next to it, a worker who sifts the dross for brass fragments which are fed back into the smelting cycle. Next door is an in-house electro-plating facility, and beside it is a polishing room where workers burnish shiny brass plumbing fixtures before they are packed for shipment to Dubai. To see the entire cycle - from scrap to packed product - would be unusual and expensive anywhere else in the world; but in Jamnagar, it's not only possible, it's expected once a company has attained a certain scale.

#### A mega-city in waiting

But Jamnagar is changing, its economy spurred by strong consumer demand for quality brass plumbing and electrical equipment, especially from thriving housing markets in the UAE, other Gulf States and India's emerging home buyers. 'Jamnagar is going to be a mega-city,' Anil confidently predicts. But more than that, it's going to be a modern manufacturing mecca, albeit one with Indian characteristics. 'CNC machines are coming; extrusion plants are here,' he enthuses. 'More than 50 already - another 50 to come.'

In five years, Anil assures me, there will be no small foundries in Jamnagar because pollution controls will extinguish them if market forces don't do it first. There will still be smaller casting plants serving smaller manufacturers (say, those manufacturing 1000-piece orders), but the future is 'big houses, all infrastructure under one roof'. And no small coal-fired sand-casting plants. This goes for Pooja too: 'This plant will last another three to five years and then we convert entirely to our new facility,' Anil insists.



Pooja's new facility is still a large field - albeit a large field that has appreciated considerably since Anil purchased it and the state government designated it, and a large parcel of land around it, as GIDC3.

### 'No future' for coal-fired plants

Sunil drives me past the empty field and then stops beside a large new warehouse belonging to Shree Bhavani Extrusion. I follow him into the loading area where a motorcycle rickshaw pulling a small trailer is being loaded with 500 kg of new brass rods destined for a local manufacturer. Beyond it I can see a long warehouse where dozens of workers are cutting, polishing and tying together rods extruded in different shapes. The load is going to a small electrical components manufacturer who supplies the local housing market.

Shree Bhavani's Managing Director Kamlesh Jobanputra leads me through this one-year-old plant built to expand, modernise and fortify his family's 25-year-old business, he explains. 'For most of our history we had a coal-fired foundry and made components. And then we learned that coal-fired plants have no future.'

We pass an unloading area where a fork-lift is offloading small bales of domestically-sourced brass oil cans from a flat-bed. Nearby sits a pile of brass shavings in sacks sourced locally. In passing, he mentions that he also buys significant quantities of No. 1 copper and zinc scrap locally. But that's just the start of his mostly-undisclosed material needs: he also imports three containers of Honey per month and, as the market allows and his needs dictate, quantities of copper and zinc. Since opening the new plant, his material needs have tripled and he expects them at least to double again in the near term.

'This is why,' he says, pointing at the platform atop his 375 kW, Indian-manufactured electric furnace. We climb the stairs and stop beside several workers feeding baled oil cans into the smoking furnace, stuffing them down with long steel pokers. Above the melting scrap is a large blower that drives the pollution into a bag house. But it's quality, and not pollution control, that most concerns Mr Jobanputra. 'If you need 57.2% copper content, we can do that,' he says. 'But before, when we only had a coal-fired plant, we couldn't and lost a lot of money. Now we don't have the loss. Instead, we have new, bigger customers.' Nearby are sheets of lead and small piles of zinc



Kamlesh Jobanputra, Managing Director of Shree Bhavani Extrusion.



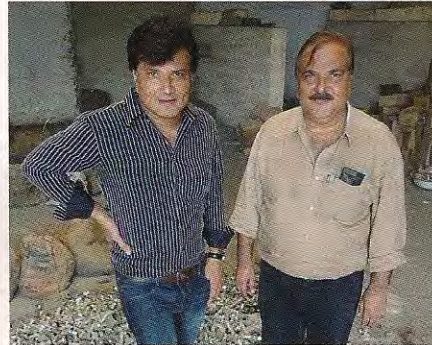
Hement Gokani, owner and founder of Bajrang Brass Industries.



Ramgopal Maheshwari, Managing Director of Siyaram Metal Udyog - Jamnagar's biggest importer of scrap metal.



Kanti Joshi, Director and owner of Mascot Metal Traders and President of the Jamnagar Exim Metal Merchant Association.



Sunil (left) and Anil Pachmatia of family-owned Pooja Metal Industries in India's 'Brass City'.

scrap for the mix. 'We have a uniform product and we can compete with anyone,' he declares. 'With a modern plant, I can compete with China.'

### Contracts largely honoured

The Indian government's heavy-handed regulatory tradition has long been blamed for stunting the growth of the country's industries, especially those with a foreign trade component. In the scrap arena, India's highly-conservative business culture has led to difficulties between Indian importers interested in relatively small volume buys on flexible terms, and foreign exporters burnt by broken contracts, especially in the wake of the 2008 financial crisis and commodity market crash. And yet with some notable exceptions, Indian

importers largely honoured contracts during the 2008 crisis - a fact that's quietly but increasingly recognised by scrap exporters looking for safe global markets. 'If people want to do business,' says Sunil, 'the Jamnagar traders will find a way to do business with them. Anyway, it's a small town. If I break a contract, if someone else breaks a contract, the whole town knows about it.' Shree Bhavani imports its scrap through the use of trusted agents like Sunil. 'They wouldn't just import from somebody they've never met before,' he explains. 'They want to know that somebody they know is involved in the trade.' As a result, his Prime Impex office in Dubai plays an important role for scrap-hungry Jamnagar traders who want imported metal but don't have the personal relationships abroad to trade it themselves. 'So they trust me instead,' he says. 'Jamnagar is a small town. If you want to trade into Jamnagar, you need someone who's known in Jamnagar.'

### Old ways coming to an end

Mr Joshi tells me that he learned the business at a scrap yard on 163rd Street in the Bronx during the 1970s. 'I was paid with a sandwich and two coffees per day,' he says. He returned to India and started importing in 1978. Today, his son handles the family's wide-ranging business interests and Mr Joshi is free to look up at a smokestack and the cloud of coal dust pouring from it. 'In two years, the pollution department will cut off their noses if they see that,' he says. 'The old ways of Jamnagar are coming to an end. The future is the big plant and electric furnace. There will still be some small plants, but they'll need to be clean.'

Nonetheless, Mr Joshi is aware of the danger faced by Jamnagar if regulation reaches the city too fast. To his way of thinking, it would be better - and safer - if education rather than regulation changed Jamnagar. 'You need to teach people what the consequences are if they pollute,' he argues. 'The pollution control measures are moving too fast. We've asked the government for more time.'

He points to a picture taken of him with India's environment minister. 'In ten years, Jamnagar will be completely different,' he muses. □

Adam Minter is a Shanghai-based journalist who writes about business and culture for US and European publications. He also maintains a blog at: [www.shanghaiscrap.com](http://www.shanghaiscrap.com)