

# The woman who loves garbage: Veena Sahajwalla on making the best of waste

The inventor of green steel is working on a way to recycle smart phones, support developing countries and inspire young women - all at the same time

**Brigid Delaney**

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Professor Veena Sahajwalla is passionate about rubbish.

Throughout her career, the director of the Centre for Sustainable Materials Research and Technology (SMaRT) at the University of New South Wales has been looking for ways to transform waste into something useful.

One of her greatest achievements is the invention of so-called “green steel”, the environmentally friendly technology for recycling end-of-life rubber tyres to replace coal and coke in steelmaking. It has meant that more than 2m tyres have been diverted from landfill and greenhouse gas emissions have been reduced.

In 2014 she was awarded the Australian Research Council Laureate fellowship to develop environmentally and economically sustainable micro-recycling of e-waste.

“The work that we do around recycling and waste material is really thinking about a whole new way of transforming waste. Traditionally people think about recycling waste to the same product - so plastics to plastics. When we have more complicated products, such as electronic devices, we have to think differently.”

With electronic devices, the recycling process is complicated “because there are lots of different types of materials locked into a phone or computer. So you have to think about reforming. It’s the transformation of waste to higher value products.”

Sahajwalla is working with companies in the developing world to extract maximum value from electronic waste products, and at the same time finding ways to reduce pollution and harmful health effects.

“If someone in a developing region were just after the copper, and you were a little village somewhere, you had no facilities and some of the plastics were burnt in the open air and you were breathing in the toxins and carcinogens, then a lot of these gases could be lethal.”

Instead she supports the creation of micro factories in developing countries, with cleaner technology. “If you can process things on a smaller scale - in smaller towns and regions - then you create an economy in those places.”

“As Australians, we are great users of technology. We need to think, at the end of its life, if it no longer works as a phone, the materials are in there, locked in. They are extremely valuable and a micro factory in regional areas is a great solution to extracting them in an environmentally sensitive way.”

Waste - and how to make the best of it - has been on Sahajwalla's mind from a young age. “I was born in Mumbai. It's a crazy city with a big population - 18 million people - with a big amount of waste produced and factories. I grew up in a place where there was a lot of industry and buzz around waste, and I'd walk past these factories and see all this waste, and I thought: this is what I want to do.”

It's been an enduring passion. “Even now,” says Sahajwalla, “I look at hard rubbish and I think ‘How can you throw that out?’”

She even asked for her old battery back when she got her watch fixed. “Call me a hoarder if that's what it takes. One time I came back to work on a Monday morning with all the chip bags that I consumed on the weekend and I saved the chip bags, because you can do something with them.”

There are deeper issues at play other than just a reluctance to throw things out. She would like to encourage everyone to rethink how they look at rubbish. “Should we look at it as a waste or should we look at it as a resource?” asks Sahajwalla.

“For us, it's about something all of us in society are using ... we can see everything as part of our lives. It's a resource. Instead of mining below the ground for our resources, we should look above the ground. From our context, it's a perfect win-win outcome. In a collaborative manner, we can use or share our resources.”

Sahajwalla has long worked in the traditionally masculine steel industry, but the lack of women in the sector has not been a stumbling block to her success.

“You see the numbers of female scientists in the field and it's smaller than other science and engineering fields. But we've had tremendous success, even in the steel industries, a lot of female students have been employed,” she says. “I don't see [gender] as a barrier - it's an exciting field. If you have something exciting to bring to the table, you don't have to be afraid to speak up. Industry partners and scientific colleagues are listening and so appreciative.”

About 20% of people working in the field are women. Sahajwalla is involved in initiatives addressing the challenge to encourage more younger women to join the industry. “We would like to increase the number of young women entering the pipeline. We have launched a young innovators program for young women in year 12.

“It's an exciting domain for young people, bringing together sustainability and technology. You can be an engineer and scientist and you can work across the fields.”

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