Prof Veena Sahajwalla FAA, FTSE, HonFIEAust, CPEng, Scientist, Engineer, Inventor.
"A smart vision for a circular future: SMaRT technologies and MICROfactories™ creating sustainable materials and products from waste resource"

Professor Veena enthralled us with her ability and enthusiasm in describing the important inventions the UNSW Sustainable Materials Research and Technology (SMaRT) is developing through its microrecycling science.

I would strongly recommend that you share her important work with your families by watching the ABC's "Australian Story" about her life and research successes. This can be seen by clicking the underlined link on the SMaRT website
www.smart.unsw.edu.au/

Many items on that website are worth viewing, including a 10 minute video summary that reinforces the messages she presented to us. See
https://www.smart.unsw.edu.au/news-events/news/video-10-minute-genius

The central theme of her presentation was that waste needs to be rethought as a resource and an opportunity, harnessed by careful collection, segregation and innovative processing and new technologies to produce useful economic materials, while reducing the massive volumes going to landfill.

She described some of the remarkable advances that have been achieved through research by her and her team at UNSW in designing products fit for purpose for real world outcomes derived from waste, including new technologies using

- old tyres as a replacement for coke and coal to make Green Steel™
- discarded plastics to produce filaments for 3D printing
- old fabrics, mattresses and plastics mixed to produce Green Ceramics
- old batteries to recover valuable metals to make alloys, electrodes etc
- e-waste from old computers, printers, phones etc to produce new feedstocks or products to help make components needed for future electrification needs.

The liberation of key elements from waste by clever chemistry is critical, thereby extending the old 3 Rs (Reduce, Reuse, Recycle) by adding a 4th R, "Reform".

A key feature in this work has been the team's development of various MICROfactorie™ Technology modules, which enable high temperature transformation at a scale that is suitable in regional centres, not just in big cities, noting waste is widespread, and hence reducing transport (and fossil fuel usage).

She described the close collaboration her team has enjoyed with partners in the community in developing practical solutions, eg with steel maker Molycop at Newcastle, Shoalhaven City Council, a mattress recycler at Cootamundra etc, plus end users who have incorporated the products into their buildings (Hornsby Council, Mirvac).

A further benefit of this recycling (and steps to the circular economy) is that these new products reduce the need for the extraction of raw materials from the earth, preserving resources for longer.

After a dynamic Q&A, John Thom thanked Veena for providing us with such an inspirational address, which challenged us to rethink what we can each do to help this global environmental challenge.

PJ