

# Scarcity

JAN MENGELERS,  
CHAIRMAN OF THE TNO BOARD OF MANAGEMENT



Photo: Jaap Oldenkamp

*‘Sustainability’  
is the codeword*

It's been a remarkable winter by any standards, with heavy snow punctuating much of the European continent: and a consequence of the harsh conditions has been for some countries a lack of salt to keep the roads driveable. It may seem odd that in the modern western world where you can buy all you need at the supermarket, where the availability of water, gas, electricity and communication are taken for granted, and where, despite the economic crisis, employment is still relatively upbeat, we have been hit by the fact that there is such a thing as scarcity. Mind you, that's not a bad wake-up call because in the decades ahead of us we will be confronted by more instances of *scarcity* that are likely to have much more serious consequences than the recent lack of salt for our roads.

A couple of examples. The availability of sufficient drinking water has been diminishing since 1960 for both developed and developing countries, though for the latter this trend has been much more serious and that can have a huge impact on public health, food production, environmental management and industrial production. It may ultimately lead to high-risk geopolitical tensions.

As the world's gas and oil stocks are depleting, it is striking that developing countries have become the suppliers and the established economies, which are struggling with other problems, the buyers. Some transit areas are highly unstable regions. And as rising demand contests dwindling stocks, the pressure on ecologically susceptible areas will only increase. A case in point is the Arctic regions that are suspected to contain significant stocks.

Much of our technological development and progress depends on the availability of increasingly scarcer metals like gallium, indium, neodymium, rare clays, etc. Without these materials there would be no cell phones, batteries in electric cars, LCD displays, leds, solar cells, lasers or fuel cells. In a recent study by TNO and its subsidiary The Hague Centre for Strategic Studies, this scarcity of raw materials was referred to as a matter of national security because of the shifting international power relations that could be decisive.

For countries like the Netherlands the scarcity issue will have an impact in another area: the future lack of workers due to ageing, lack of space (from roads to integrated circuits, problems that TNO can help to resolve through technological solutions).

So how do we go about dealing with this world of future scarcity? We can extend the lifetime of existing products through redesign, recycling and reuse of materials and by using substitute materials and developing new products. 'Sustainability' is the codeword here along with the most fundamental solution of reducing consumption.

TNO's research is contributing to combating the different scarcity problems referred to here. But these efforts by us, other knowledge institutions, universities and polytechnics are confronted by yet another scarcity: money for R&D. At home, and perhaps elsewhere too, this is a distinct trend; the ratio of publicly and privately funded R&D is also a cause for concern. But for *that* scarcity there is one simple solution...

jan.mengelers@tno.nl