Engineers love tinkering with just about anything. Some however prefer to spend their time dismantling and recycling things. With his business, Aircraft End of Life Solutions, Derk Jan van Heerden is one of them.

Next to the faculty of Aerospace Engineering’s hangar, the cockpit of a 35-year-old Fokker F27 lies between an F16 and a helicopter. Two years ago, Derk Jan van Heerden bought eight of these aircraft from WDL, a German airline. They had been left to waste away at Cologne airport. Van Heerden cut the Fockers into pieces and sold the parts to training centres across Europe, including TU Delft. Like many aerospace engineering students, Van Heerden’s choice of study was sparked by his interest in aircraft construction. But during an internship at KLM he came across a completely different aspect of aviation: what to do with old aircraft? For KLM, he calculated that it makes economic sense to dismantle an old Boeing and re-use the components.

Van Heerden had identified a hole in the market. Immediately upon graduating in 2005 he set up Aircraft End of Life Solutions, a company specialising in scrapping old aircraft. “Pardon me, but scrapping? That’s not what we call it,” chides Van Heerden, who now employs five people and has already processed 25 aircraft. “Scraping has negative connotations, and makes what we do sound simple, which it certainly isn’t. We do two things: we disassemble and then dismantle the aircraft.”

His company brings in heavy machinery to cut the old aircraft into pieces. Components like the cockpit, landing gear and engines sometimes end up at training centres. It is however often more lucrative to remove the meters, actuators and other components from the aircraft and resell them once they’ve been recertified. “It depends on the individual requirements of the buyers and sellers,” Van Heerden explains. “Some of them do not want us to market their aircraft equipment because that would reduce the value of the components they still have in stock. In such cases we must then cut all the small meters in half.”

Anything that cannot be re-used is shredded. Van Heerden: “We start by using enormous machinery to cut the aircraft into large pieces. The rearmost part of the aircraft simply disappears like snow melting in the sun. We cut the tail into pieces measuring 10 x 10 cm. That’s the end of the process for us. We sell the scrap to metal smelters, who then separate all the metals.”

Van Heerden is about to face a major challenge, though. He has just begun work on a Boeing 747, the largest aircraft in his career thus far, for which he’ll need to hire some large-scale equipment: “We’ll have to watch out that the heavy cutting machines do not destroy the asphalt.”

MIT technology magazine Technology Review reports that the construction of nuclear reactors in the United States and in many other places has virtually ground to a halt. This is despite government credits guaranteeing up to 80% of construction costs, political support from President Barack Obama, and high-level advocacy from such influential figures as Bill Gates and environmental activist Stewart Brand. Obstacles, delays, postponements and problems are emerging all over the place. Except, of course, in China, where at least 24 new nuclear power plants are under construction. So what is the West’s problem? In a word, money.

Dr Aad Correlje (Technology, Policy and Management) explains why. In the 1970s, when today’s reactors were first built, the market economy was in a much earlier stage of development. In those days, the energy companies agreed an acceptable energy price with governments, based on the repayment of construction costs during the estimated life cycles of the power plants. This was supplemented, of course, by a profit margin for the energy companies. The main advantage of this approach was that the energy companies avoided any financial risks. In the United States, a similar system, known as ‘cost of service regulation’, was applied. According to Technology Review, this system is still in use in a number of southern US states, but these are the only states in which the industry is still showing any signs of life.

As in Europe, other US states have switched to the auction model for the energy market. Technology Review explains: ‘All power companies get the same price for their electricity. That price is usually determined by the cost of natural gas, making the construction of a new nuclear plant unthinkable.’

Dr Correlje adds that natural gas prices in the United States were relatively high after the country’s natural gas production peaked. But the recent extraction of new shale gas has led to increased production and a reduction in the price of natural gas. Consequently, energy prices dropped and enthusiasm for nuclear energy waned. ‘Carbon pricing alone is all that can save nuclear energy’, claims the MIT journal. ‘An amount in the region of $10 per tonne of CO2 could make all the difference.’

Industry analysts projected a price of $60 to $80 per tonne, but that never happened because the US Climate Bill was never passed. “There is a lot of uncertainty as to whether it ever will be enacted,” Jay Apt from Carnegie Mellon University told Technology Review.

Against this backdrop, it is likely that the Netherlands will build one or two more nuclear plants, as the government has announced? Correlje thinks not. The costs and financial risks are too high and prices of energy and emission rights too uncertain.

Technology Review, ‘Giant holes in the Ground’, 12 November 2010