Dutch chemicals company OCI Nitrogen slashed harmful dust emissions from its fertiliser plant from 174 tonnes a year to zero. They also increased production by 30% and made substantial energy savings in the process.

'We are very proud of the result: an innovative and unique system in our industry,' says CEO Gert-Jan de Geus, a food technology engineer with a background in production management, procurement and plant management.

OCI Nitrogen, which produces ammonia, mineral fertilisers and melamine from its base in Geleen in the southern Netherlands, was runner-up in the European Business Awards for the Environment 2014-2015 Process category.

The innovation came about in response to ‘a difficult political context’, explains de Geus. The Dutch government was putting pressure on the sector to reduce the transport by rail of ammonia.

OCI Nitrogen, which employs 450 people, agreed to close one of its fertiliser production plants in the north-west of The Netherlands that used ammonia delivered by rail, but requested in exchange permission to boost production at Geleen. To gain a permit for the expansion, the firm had to meet much stricter standards on emissions of fine dust particles. With the standard technology used in the sector, dust is typically generated when fertiliser granules are cooled down, using large volumes of air. But when these fertiliser dust emissions are emitted into the environment, the very fine particles can harm public health.

‘The new standards were not achievable with existing technology,’ says de Geus. ‘So we started to think, “What would happen if we made no dust at all?” I’ve always been motivated to encourage people to go for the edge and realise unexpected results.’
What followed was a pilot using a classic cooling system, sluicing cold water around the outside of a tube containing the static granules. ‘The technology itself wasn’t complicated. The difficulty comes from the fact that this particular product turns into one sticky clump at a certain temperature and during the process it goes through a broad temperature range.’

Despite their fears, the pilot worked well. Delighted, the firm forked out EUR 7 million for a full-scale cooler unit, built by German firm Coperion, with capacity for a third of the plant’s production. But then they hit a wall. ‘We installed the cooler and it didn’t work. It completely blocked,’ says de Geus.

After 18 months of modifications, tests and frustration, everything suddenly fell into place. The new unit was operational to around 70%, enough to convince managers to invest a further EUR 14 million in the other two coolers needed to meet the total production capacity. ‘My special interest in this plant was to improve operational efficiency,’ says de Geus.

The two remaining coolers were then up and running by summer 2013. The effects were immediate. ‘In the old days we had to reduce production by 50% on hot days, but with the new system we can maintain production levels.’

With the three new coolers now operational, the plant reduced dust emissions to zero, increased factory capacity by 30% and cut energy consumption by more than EUR 1 million a year.

The innovation has gifted the company a march on its competitors. With European maximum emissions standards determined according to Best Available Technologies (BAT), it will not be long before standards have to be adjusted to reflect OCI Nitrogen’s new system. And other companies now also have the option to purchase the cooling system, via Coperion.

— We are very proud that we had the guts to try it and succeeded. We took the gamble. Sometimes you have to just do it.

GERT-JAN DE GEUS

Showcasing Europe’s leading eco-innovators

The European Business Awards for the Environment

Presented every two years, the awards recognise businesses that have taken steps to improve their environmental performance and contribute to sustainable economic development. Companies compete in five categories, which reward green innovation in management, product and services, process, international business cooperation, or in combining business and biodiversity.

Businesses of any size, from any sector, can compete. Standards are high, as the competitors are already ‘the best of the best’: to enter the European Business Awards for the Environment, you need to have been a finalist in a national competition first.

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