

T H E

FUTURE

OF ALTERNATIVE

FUELS

LARS JENNISEN AND
NEVILLE ROBERTS, N+P GROUP,
THE NETHERLANDS, DISCUSS THE
RECENT DEVELOPMENTS OF THE
N+P GROUP IN THE FIELD OF
ALTERNATIVE FUELS.

Recently, the main technical developments from the N+P Group have come from a technical relationship with Loesche and moves into other industries that are offering potential for the expansion of the company.

In the company's last article for *World Cement* the company's development over the past 25 years and the various types of fuel supplied by N+P and the process

and logistical support offered to alternative fuel (AF) consumers was outlined.

As was mentioned in this previous article, N+P successfully carried out tests at coal fired power stations equipped with vertical roller mills with a mixture of 90% coal and 10% Subcoal®. Furthermore, VDZ – the German cement association – also carried trials on a horizontal ball mill where it was again demonstrated that a mixture of 20% Subcoal® and 80% coal can be pulverised without any problems.

With this background N+P felt confident that the concept of co-milling was a very interesting feature of the Subcoal® pellets that would assist in the marketing of the product. This gave N+P the confidence to bring this matter up with Loesche. After initial meetings Loesche agreed to carry out trials in their test plant in Dusseldorf over a 3 day period in the autumn of 2015. The results of the tests were highly encouraging, with Loesche concluding that the level of co-milling at 30% Subcoal® and 70% coal posed no problems at





Loesche test mill.



Work being carried out at Subcoal Production FRM.

all. After further analysis of the test results, Loesche saw a possibility to further increase the percentage of Subcoal®. However, this would depend on certain process and mechanical modifications. Further tests are now being organised at the Loesche R&D centre.

With the support of Loesche, N+P will carry out full commercial trials in cement plants. These trials will be technically accompanied by Loesche and N+P, which gives any company confidence when considering such developments.

N+P is now working very closely with Loesche and are preparing for a series of commercial trials in

various industries throughout the remainder of 2016. Once the trials are completed N+P aims to publish the results to the cement industry.

New production facilities

As has been previously stated in recent articles, N+P currently produces Subcoal® in its own facility in the Netherlands. Originally a spin off company from the Dutch chemical company DSM, N+P acquired the patents for Subcoal® production in 2013 and developed its own patents for various applications. In recent months the demand for Subcoal® has risen dramatically, placing heavy production pressures on the facility.

The decision was therefore taken revamp and upgrade the Dutch production facility. This work was completed in June 2016 with the following items being addressed:

- Routine shutdown maintenance work was carried out throughout the plant.
- Upgrade of the pelletiser feeding system.
- Upgrade of the factory waste feedstock feeding system.
- Installation of bypass systems to remove dry materials and to bypass the dryer system.
- Removal of redundant items of plant from the initial installation.

This work will increase the plant's capacity by approximately 30 – 40%. This will not be enough to satisfy the medium term sales forecasts so it has been agreed that the next production facility will be built in the UK. The decision to invest into the UK market is for two reasons. Firstly, the UK waste market has great value due to the continually escalating Landfill Tax adopted by the UK government. It is anticipated that the tax will continue to rise for some time, thus putting extreme pressure on landfilling and so adding further security to this type of investment in the UK.

Secondly, N+P is seeing great interest in terms of off takers in the UK, with a number of industries beginning to embrace the concept of AF and looking to use Subcoal®.

The new site has many advantages to N+P:

- The area is a good source of high grade waste feedstock.
- The site is highly suitable for development as an alternative fuel plant.
- Situated in an industrial area.
- All services are available to the site including power.
- The Authorities have a very positive attitude to the project.
- The location offers itself as a very good export location to assist in satisfying the demand for Subcoal® on the Continent and in North Africa.

Planning work regarding this project is already underway. The plant has the following main features:

- Expected input: 180 000 tpy.



Subcoal Production FRM during revamp work.



Subcoal® 16mm pellets.

- Expected output: 130 000 tpy.
- Input commercial and industrial waste streams.
- Expected output quality.
 - 20 – 24 GJ/t.
 - Moisture <10%.
 - Ash <12%.
 - Cl <0.8%.
 - Biomass >50%.

It is planned that this will be the first of a number of plants in the UK to satisfy the high demand and strong export requirement in the country. In addition, N+P is also prepared to invest in building other facilities in other countries where the demand is high and where the economics of such a facility will work.

Expanding into other industries

The development of the Subcoal® concept has delighted N+P with its various financial backers offering all assistance in ensuring the sustainable development of the company. The interest in the concept from other industries has added to the confidence in the concept and has encouraged various investors to become even more active.

Coal-fired power stations

Discussions have taken place with Dutch coal fired power stations over the past 24 months. Early

discussions addressed the issue of emissions with concerns about dioxin and furan emissions. It became clear that the power station furnaces behaved in a very similar way to cement kilns, where the dioxin reformation mechanism or DeNovo Synthesis are such that these hazardous organics are not emitted and that the burning of Subcoal® would not result in any additional emissions due to the temperature profile. In addition it was discovered that as with cement plants the emission of NO_x was reduced, albeit not as significant a reduction as seen on cement plant emissions.

N+P opened discussions with a large power station and commercial trials commenced in May 2016 on a 600 MW station. So far all results are very promising.

Steel plants operation blast furnaces

N+P also decided to investigate the possibility of using alternative fuels within the steel blast furnace processes. It quickly became clear that there was a fit between the steel industry and the use of alternative fuels, in particular the use of Subcoal.

It was discovered that some leading plants around the world were already involved in this type of fuel. Further investigations confirmed that the quality of Subcoal® would fit very well with the plants already burning alternative fuels. The reaction to Subcoal was extremely positive and a full commercial trial was agreed. This trial will take place in the summer of 2016 on a steel blast furnace in Central Europe. N+P will report on the trial results as soon as possible.

Conclusion

N+P has a long track record in producing high quality fuels for the cement industry and in recent times has also offered many other technology services in order to be differentiated from traditional alternative fuels trading companies. The company has now moved forward by developing a technology led co-operation with Loesche which should prove very attractive to the cement industry.

The company has now also moved into other industrial sectors. This gives N+P confidence to further expand it's production base by building new plants firstly in the UK with the strong possibility now to develop further in other countries.

Whilst N+P still looks upon the cement industry as it's natural home, it is now looking elsewhere for other potential sectors that may act as off takers. This will give existing N+P clients confidence in that more production facilities are being built to satisfy the ever increasing demand and that the in-house technical base of N+P is being further enhanced by the close co-operation with Loesche. 🌐