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Case story | VACON® NXP Grid Converter

Generating energy from green waste to fuel a city

About Jeffries Group

Jeffries Group is South Australia's largest green waste processing facility with 70 years of experience and a passion for delivering premium compost, soil, and mulch for agriculture.

The situation

Driven by a generations-deep commitment to being the link that keeps the recycling circle closed, Jeffries Group identified a huge opportunity. With the right technology, they could use biochar to generate enough renewable energy to run their entire operation and feed surplus energy back into Adelaide's power grid—with zero emissions.

Discover how the Danfoss VACON® NXP Grid Converter manages power in long-standing partner gTET's ORC generator—the technology behind Jeffries' fantastic biochar power station and the first of its kind in Australia.

The challenge

Jeffries Group is leading the renewable green waste market, setting new standards for more sustainable practices in the recycling industry—both on its home turf of Adelaide, South Australia, and across the globe.

They identified an enormous untapped potential to build a power station that leveraged biochar, the charcoal byproduct of pyrolysis, to generate renewable energy that would power their operations—and supply Adelaide with surplus energy. First, there were two clear challenges to overcome:

- Finding a high-performance solution backed by reliable technology
- Ensuring the solution had AS4777:2015 certification, a requirement to send surplus energy into Adelaide's power grid

The solution

Danfoss Drives supported its long-standing partner and thermal energy management solution provider gTET with integrated VACON® drives—critical components in their Organic Rankine Cycle (ORC) generators.

Based on their market-leading high-speed regenerative capability, VACON® drives are integral components in the operation of the ORC generator's turbo-alternators. Several VACON® power converters were integrated into the system designed for the Jeffries Group:

- Two VACON® NXP Grid Converter units, type NXA 261 AFE
- 3 NXI 0385 inverters
- 2 NXI 0072 inverters

As part of an ongoing partnership with gTET, the VACON® NXP Grid Converter units obtained AS4777:2015 accreditation—making it possible for Jeffries Group to connect with Adelaide's power grid.

“The VACON®-powered ORC generators are AS4777:2015 certified—and have enabled Jeffries to establish Australia’s first biochar power station with net zero emissions.”

Paul Keen, Managing Director of gTET

The outcome

The Jeffries Group power station produces a commercial biochar product that is sold for agricultural soil—and it also generates 300kWe of power, significantly reducing the plant’s consumption from the city’s power grid. Furthermore, the installation produces at least 2GWh each year of power generation replacement from Adelaide’s power grid—emission-free.

As an integral component to gTET’s high-performance ORC generator, the Danfoss VACON® NXP Grid Converter units delivered with high-speed regenerative capability, supporting the intense processes in the energy-from-waste power station. And with the necessary certifications in place, Jeffries Group was able to act on its vision to build Australia’s first biochar power station.

Read the full story **here,** and discover more case stories on our **website.**

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