

A new, sustainable income stream for power plants

# INTRODUCING THE VALMET BLACK PELLET PLANT

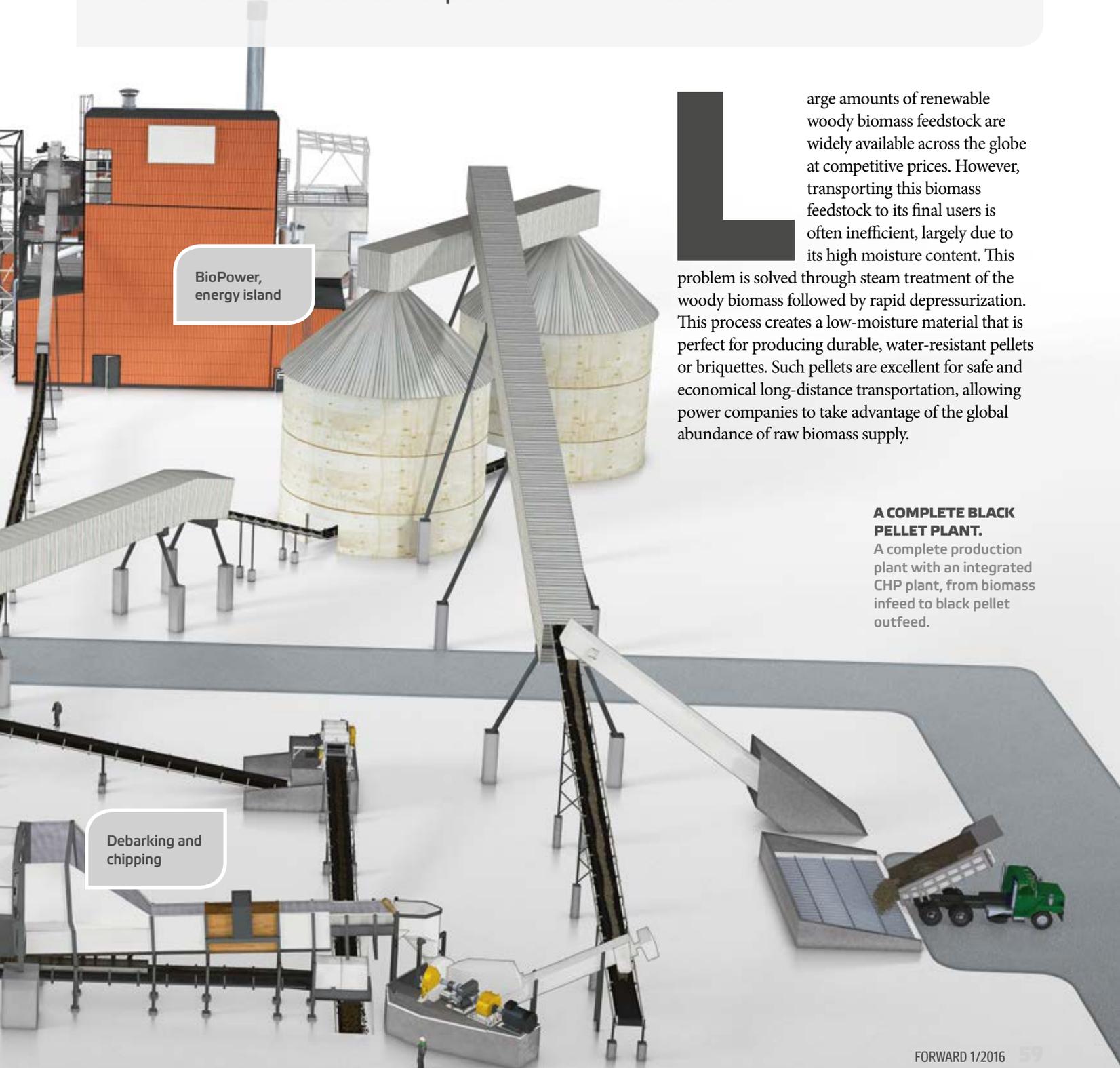
BioTrac, steam  
explosion  
system

Pelletizing

Belt dryer



Black pellets are a type of renewable biomass fuel that can replace fossil coal in power plants, significantly reducing carbon emissions. Steam exploded black pellets are safer, more cost-effective, and deliver more energy than conventional "white" biomass pellets. Valmet can deliver a complete black pellet production plant, from infeed of raw biomass feedstock to output of solid biomass fuel. TEXT Kerstin Eriksson



BioPower,  
energy island

Debarking and  
chipping

**L**arge amounts of renewable woody biomass feedstock are widely available across the globe at competitive prices. However, transporting this biomass feedstock to its final users is often inefficient, largely due to its high moisture content. This problem is solved through steam treatment of the woody biomass followed by rapid depressurization. This process creates a low-moisture material that is perfect for producing durable, water-resistant pellets or briquettes. Such pellets are excellent for safe and economical long-distance transportation, allowing power companies to take advantage of the global abundance of raw biomass supply.

**A COMPLETE BLACK PELLET PLANT.**

A complete production plant with an integrated CHP plant, from biomass infeed to black pellet outfeed.

## Minimizing capital expenditure

The solid biomass fuel produced in Valmet's black pellet plant is steam exploded and can thus be ground into a reactive powder suitable for burning in large-scale power boilers or in specialized pellet-burning systems. Black pellets can thus replace fossil coal up to 100% in smaller units and up to 70% in larger units. The powder produced by grinding has a relatively high bulk density and is free flowing, meaning that it is ideal as a feed material for entrained flow gasification systems as well.

"Black pellets contain and retain more energy than white pellets. There is no self-heating or off-gassing, and the low amount of dust minimizes the risk of fire hazards. They grind and burn more like coal than white pellets, which saves customers both capital and operational expenses," says **Mattias Ericson**, Senior Sales Manager at Valmet.

Black pellets are cheaper to ship than white pellets. This is due to the higher wet and dry durability of black pellets, as well as the fact that they hold about 15% more energy per tonne and have 15% higher bulk density than white pellets. That gives savings of approximately 30% with black pellets compared to white pellets just in shipping, regardless of prevailing fuel prices. In addition, black pellets can be handled and loaded/unloaded in the rain. This is not an option with conventional white pellets, which immediately disintegrate upon contact with water.

## Proven and safe technology

Valmet's steam explosion technology is based on decades of experience arising from numerous deliveries of projects to the fiberboard and chemical pulping industries.

"We can offer a solid technical solution with a reliable base, minimizing the technology risks of a steam exploded black pellet project. We have already completed several full-scale tests in European and Asian coal units," Ericson continues. Valmet's technology partner Zilkha Biomass has already completed nine full-scale tests of the final

black pellet product at utilities across Europe and Japan, in units ranging from 80 MW to 500 MW in size. In total, over 9,000 tonnes of black pellets have been tested by potential utility customers.

Valmet's technology is safe, as the process is based on the use of steam, with no chemical additives such as binders for the densified product. The environmental performance is built to meet any local requirement by using our in-house experience and technologies for cleaning gas and water.

"Valmet offers both complete production lines for steam exploded black pellets and revamps of existing white pellet plants. These high-energy-density, water-resistant pellets are suitable for transportation and open up opportunities for new income streams for our customers," Ericson concludes. ■

According to Hawkins Wright Consultancy, total global demand for biomass pellets is expected to nearly double in the next seven years, from 29 million tonnes in 2015 to 53 million tonnes in 2023. Almost 60% of this demand is expected to come from the industrial sectors of the EU and Asia.

### CONTACT PERSON

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## Valmet and Zilkha's collaborative agreement

Zilkha Biomass Energy LLC in the USA and Valmet have signed a five-year collaboration agreement in the field of steam exploded black pellets. The purpose of the agreement is to bring steam exploded black pellets to the global market. Combining Zilkha's profound expertise in pellet production and distribution with Valmet's excellent equipment design and project delivery capabilities brings great opportunities to develop and exploit this new emerging technology. The parties will work together to develop a joint global offering.

