



# Densified Biomass Wood Pellet Export Facility

PROJECT REPORT

CLIENT: PLANTATION ENERGY LIMITED, AUSTRALIA



CONCEPT DESIGN MANUFACTURE INSTALL COMMISSION OPERATE

INNOVATIVE SOLUTIONS TO INDUSTRY



## The Situation

Plantation Energy Australia operates a densified biomass wood pellet facility producing 250,000 TPA in Albany, Western Australia. The wood pellets are a renewable fuel source that replace or supplement coal in boilers, with the aim of reducing greenhouse gas emissions. The pellets are bound for export into the European marketplace.

Albany has an existing port, which services the wood chip and grain export industries. However it did not have any capability to receive, store or reclaim wood pellets. The requirement for the port was to receive wood pellets from trucks, and to store up to 35,000 tonnes in a dry environment. An existing wood chip loader would then transfer the product into ships.

During the port submission process Brightwater encountered and managed several significant issues that arise when storing wood pellets in large quantities.

Wood pellets can potentially produce off-gases, such as carbon monoxide and hexanes. These gasses can pose significant health and safety issues for personnel. Heat can also generate within the stockpile posing a risk of fire.

Another key issue was that the port is constructed on reclaimed land, which is 2.5 metres above sea level. This meant a requirement for specially designed building footings to negate any need for deep excavated pits.

## The Solution

Brightwater Engineering was contracted to engineer, design, procure and construct a wood pellet export facility at the Port of Albany. There were several key issues for Brightwater to manage, including; negotiating and making submissions on the port land lease, fast-track construction due to production demands from the pellet plant, and managing health and safety issues associated with the storage of wood pellets.



Brightwater designed an all-weather truck reception system for receiving of pellets, a shuttle conveying system to distribute pellets within the building, and a reclaiming system to connect the storage building with the existing ship loading infrastructure.

The wood pellets are delivered to the facility in B-Train truck and trailers in 70 tonne loads. The pellets are then tipped into the all-weather reception hopper and conveyed into the building at a rate of 250 TPH. The pellets are distributed from the shuttle conveyor to form a 45 metres wide by 120 metres long stockpile.

Brightwater designed several innovative solutions to detect and mitigate “off-gassing” within the pile. Off-gassing can result in a dangerous increase in temperature, and possible combustion, a potentially catastrophic event.

The Brightwater designed early warning fire detection system includes an array of temperature sensors for monitoring the temperature of the pellets within the stockpile.

Brightwater also designed a fire prevention system for use if the temperature within the pile increases to an unacceptable level. Water was not an option because it damages the product, and the pellets revert back to their natural state.

In the event of the stockpile reaching an unacceptable temperature, CO<sup>2</sup> is introduced into the base of the 28 metre high pile through a series of specially designed ducts and vents. The system is automatically activated by the temperature monitoring system.



## The Benefits

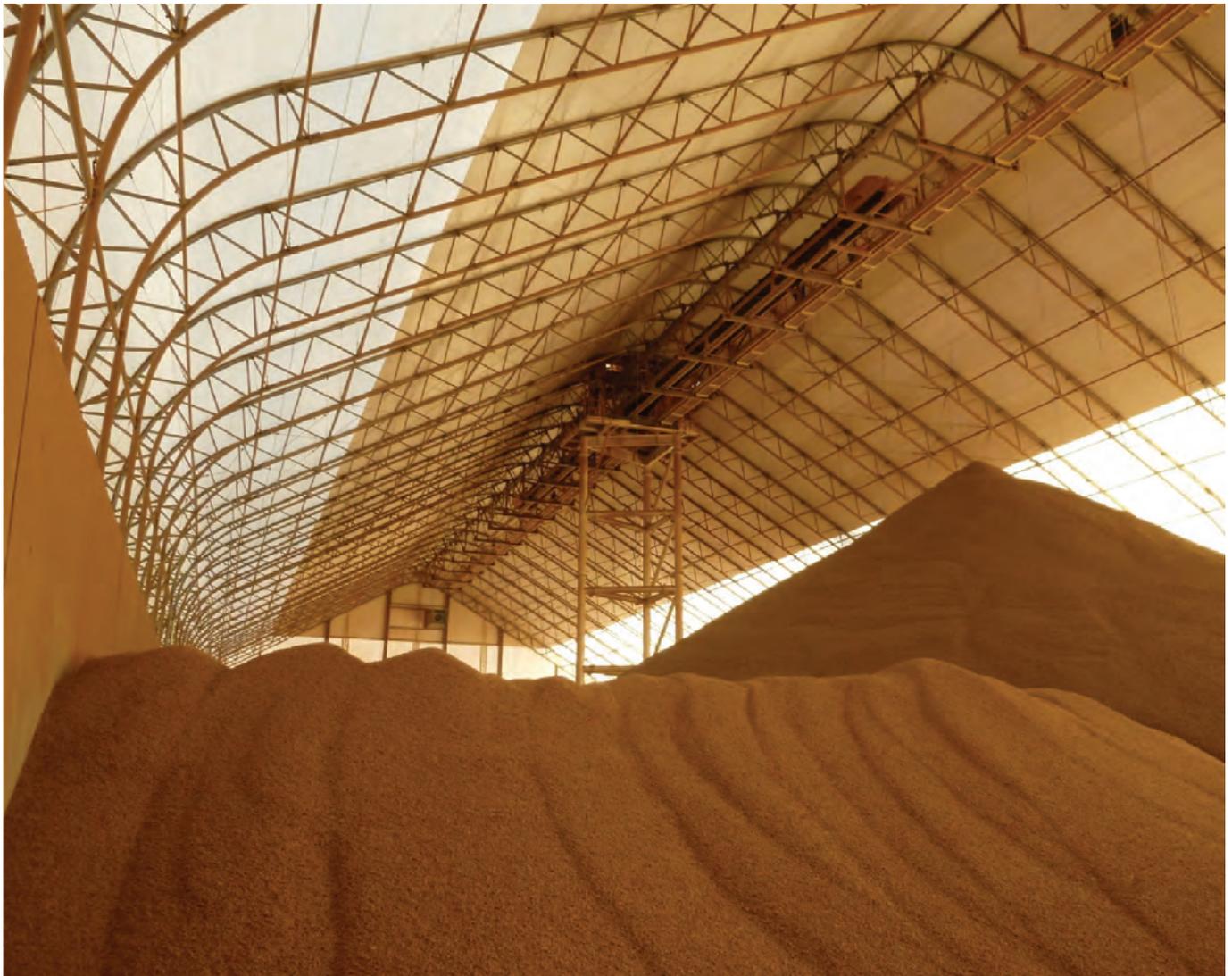
Brightwater Engineering completed this project in conjunction with Plantation Energy under a project management contract. Plantation Energy Australia were involved in every step of the process and were able to fast-track the construction as a result.

Brightwater managed the global procurement of all materials and equipment, engaged the required skills and facilitated all local council and environment requirements.

On completion of construction Brightwater provided a full commissioning service, which included commissioning of the plant, operator training, setting up a CMMS system and procurement of spares.

## The Specifications

<b>Storage capacity:</b>	35,000 tonnes
<b>Building type:</b>	Industrial fabric
<b>Medium stored:</b>	Wood pellets
<b>Pellet density:</b>	680kg/m <sup>3</sup> at 10% MC
<b>Reception rate:</b>	250tph through a grizzly
<b>Storage distribution:</b>	Shuttle conveyor



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