

Loading chutes for all biomass applications



*Shiploading Cascade chute,
loading wood pellets, biomass.*

In the global trend towards renewable energy sources, biomass has become a major sector and the volume of biomass material shipped internationally has grown exponentially. The number of biomass-fired power stations in the developed world has increased significantly, often at the expense of coal, as governments have adopted green energy policies and sought to hit their renewable energy targets.

Biomass has become a globally traded commodity and the growth in its transportation has led to interesting technical challenges and positive business opportunities for Cleveland Cascades Ltd, the specialist in the design and manufacture of bespoke dry bulk loading chutes.

The volumetric energy density of wood pellets is significantly less than coal, for which it is often a substitute. This means that more than twice the volume of wood pellet biomass is required to produce the equivalent thermal and electrical energy output of

coal. Consequently, to be economically viable the material has to be handled in huge quantities.

Wood pellets are also brittle and need careful handling to prevent material degradation during transportation. Poor handling equipment during transportation can not only damage the product but also create unwelcome air born dust pollution. When flowing, the material also carries some explosion risk and



*Silo loading chutes,
loading wood pellets,
biomass.*

typically chute components need to be designed to operate safely in this environment.

Unlike coal, which can be stored outside, biomass wood pellets need to be stored in a dry environment to prevent biological degradation. Storage of the material also needs to be continually rotated, as prolonged static storage in a silo can lead to further degradation, requiring bigger and taller covered silos for storage.

Consequently, loading chutes handling the transportation of this relatively delicate material need to be able to handle huge volumes very gently and carefully and the Cascade, controlled flow technology chute from Cleveland Cascades Ltd is designed to effectively handle all of these challenges.

The Cascade loads material through a series of oppositely inclined cones, which creates a mass flow at low velocity, yet high volume. During its descent, the material is supported through the full length of the chute, ensuring a soft delivery from the outlet to the material pile, for every load. It therefore arrives at the load pile with minimal degradation. The controlled descent of the material prevents air separating the particles and largely eliminates dust generation at source.

When moving biomass from its source to its ultimate end use in power stations, the Cascade chute can be adapted to multiple applications in the distribution chain. It can be designed as a shiploader at the port of discharge, an open vehicle loading (road or rail) chute from the port or a silo loader at the covered storage area of the power station. Cleveland Cascades has supplied numerous biomass chutes in all three of these applications across Europe and North America.

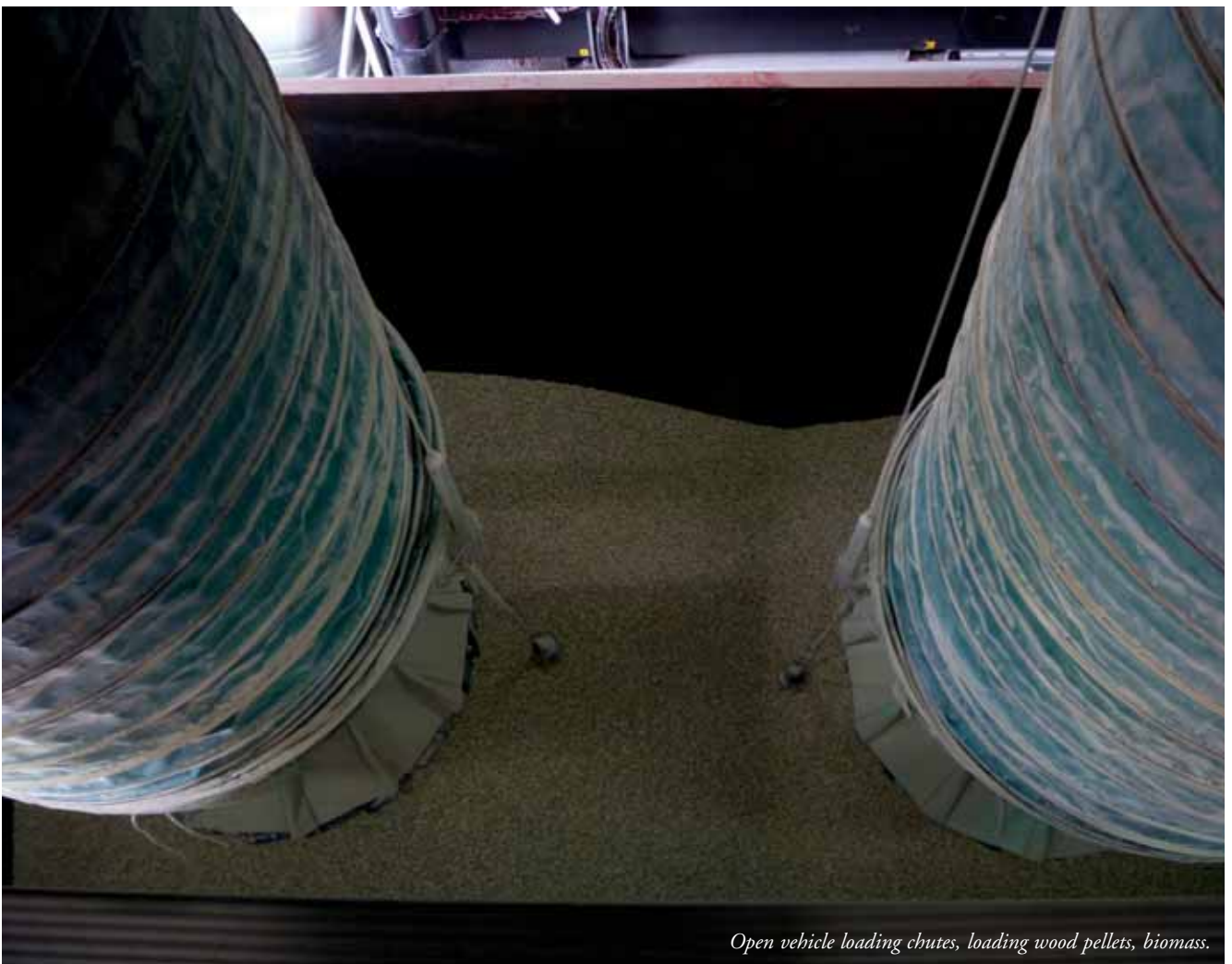
The Port of Prince Rupert, British Columbia, Canada, has a

Cleveland Cascades shiploader installed loading wood pellets up to a capacity of 2,000 cubic metres per hour. The inclined cones have an 8mm polyethylene liner and discharge the material through a 25-metre length chute.

At Port of Tyne in UK, Cleveland Cascades have several vehicle loading chutes installed to load biomass from a hopper in to trucks for delivery from the port. The six-metre-length chutes can load to 500 tonnes per hour through stainless steel lined cones. To meet local safety standards, the chutes are ATEX zone 20 compliant.

At Ironbridge Power Station in UK, Cleveland Cascades has multiple silo loading chutes, handling biomass inside enclosed high-capacity storage bunkers. Each chute can handle up to 3.5 million tonnes of wood pellets per annum through the 10-metre-length chute and ATEX zone 20 explosion proof certification.

A big part of the package provided by Cleveland Cascades is ongoing product support, from the moment the product is delivered and throughout its operating life. Commissioning engineers can visit site to help install and optimize the operation of the chute according to customer needs, upon delivery. Manuals are comprehensive and detailed to give the operators the information they need to maintain the product and maximize its operational efficiency. On site technical advice, repair and maintenance is also available during the life of the product using factory-trained engineers. Cleveland Cascade engineers have extensive international experience maintaining, servicing and optimizing Cleveland Cascade systems all over the world. To complete the support package, original OEM spare parts can be supplied with the original order and subsequently during the life time of the chute.



Open vehicle loading chutes, loading wood pellets, biomass.