

Humber International Terminal: a dry bulk powerhouse



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The Port of Immingham sits on the south bank of the Humber Estuary and forms part of the UK's largest ports complex – and the fourth largest in Europe – which operates on the country's busiest trading gateway, a channel that sees upwards of 30,000 vessel movements every year.

The Humber is very much a working estuary, a 40-mile long expanse of water with its source at Trent Falls and its mouth opening into the North Sea between Spurn Point in East Yorkshire and Donna Nook on the Lincolnshire coast, with tributaries including the Ouse, Trent and the Hull.

The river joins northern Lincolnshire and the East Riding of Yorkshire in trading success, with the four Humber ports of Hull, Goole, Grimsby and Immingham at its centre. This quartet of state-of-the-art facilities pump US\$2.2 billion into the regional economy each year, support 23,000 jobs in the area and the Port of Immingham is the powerhouse and a key driver of ABP's success on a national level.

Strategic location

Located eight miles from its sister port of Grimsby to the east, itself famous for links to fishing and food and now a well-established base for the burgeoning offshore wind industry, Immingham is the country's busiest port by tonnage, handling around 50 million tonnes of cargo each year, 20 million tonnes of which is in the form of dry bulks.

Grimsby and Immingham are also a major hub for the short sea car business. Both DFDS and Immingham Container Terminal saw significant increases in unit load traffic from Europe and the Baltic States in 2014 and this trend is continuing.

Coal, ores, grain, fertiliser, road salt

and biomass all transit Immingham on a regular basis, along with crude oil, LPG, project cargos including wind turbine components, railway tracks and even the capital's Christmas tree, which comes from Norway via DFDS' Immingham terminal before making its way to Trafalgar Square in London by road. The port also handles vehicles, Ro-Ro/lo-lo and containers.

The Estuary's natural deep water channel swerves towards Immingham from just west of Grimsby. It dictated where the port and the town would be located in 1912, and it's that channel that has allowed the port to develop and grow.

Originally established to handle coal exports, it became clear in the late 1990s that additional berthing capacity was needed in Immingham due to increasing coal imports, and a new facility that would be large enough to accommodate Capesize vessels bringing in excess of 130,000 tonnes over the quayside, was proposed.

Investment for growth

Over \$45 million was invested in the development and construction of Immingham's Humber International Terminal (HIT), which was officially opened in the year 2000. The new terminal added a 300 metre berth to the west of the existing Immingham Bulk Terminal, and dredged to a depth of 14.7 metres. An automated conveyor system was installed in 2005 to increase efficiency and allow imported coal a smooth journey from ship to stockyard and onward to the newly constructed rail load out facilities.

The terminal operates a traditional crane/grab system, feeding product onto the open conveyor system via hoppers, to be deposited into the terminal's dedicated stockyard by a fleet of semi-automatic stacker reclaimers. The stockyard can hold up to one million

tonnes of coal at any given time and stocks are mapped via GPS to ensure that each customer's product is kept entirely separate from the next. When it's called off and fed into the automated system for transport to the end user, the system ensures the correct pile is identified and the right stock is sent on its onward journey.

By 2003 it had become clear that the country's appetite for coal was still increasing, and Immingham was in need of further dry bulk discharge and handling capacity. Humber International Terminal's second berth (HIT 2) was built at a cost of \$90 million and increased HIT's total quay length by a further 220 metres – allowing HIT to handle a Capesize and a Panamax vessels at the same time, on a quay totalling 520 metres in length. By 2012 HIT had celebrated its 100 millionth tonne of cargo.

Since the construction of HIT 1 in 2000, the terminal has seen the discharge of not only coal, but also agribulks, including grain. The terminal has handled the UK's biggest ever single shipments of grain – 50,000 tonnes in 2010 and 66,000 tonnes in 2015, but it's biomass that's now seen as the future for this mega terminal.

Adapting to meet demand

As the UK's energy mix changes to reflect consumers' growing interest in renewable fuel sources, ABP has adapted to meet this need. In 2012 ABP's biggest coal customer, Drax Power Ltd, announced it would be converting three of its units to run on wood pellets following the decision to transform the UK's largest power station into Europe's largest generator of renewable electricity. ABP responded by proposing a dramatic change to its existing facilities at HIT in order to guarantee the long-term future of its most important asset.



ABP worked with Drax to plan a terminal unlike anything seen before. A projected demand for six million tonnes of North American and Canadian wood pellets per year required an innovative solution and the concept of Immingham Renewable Fuels Terminal (IRFT) was born.

Four 25,000 tonne-capacity storage silos have been built using a slip-forming process by GRAHAM Construction. The process saw the silos grow at a rate of three metres every twelve hours and these are connected to HIT 1 via a fully automated system carrying biomass from ship to silo via 1.2 kilometres of covered, over ground conveyors, and from silo to the railway network using an innovative underground conveyor belt feeding the new rail load out, designed to deliver the cargo into rail wagons which take the product straight to Drax's Selby base using the rail network. The \$200 million IRFT, which at 65 metres high, dominates the skyline of the port, is the first of its kind in the world and boasts a smaller, sister facility at the port of Hull, which has been designed to handle one million tonnes of biomass per year for Drax, but which is already handling in excess of this.

IRFT: Phase 2

Phase two of IRFT, which has seen four more silos added to the four of phase one, will double the storage capacity of the terminal to 200,000 tonnes when these additional storage giants become operational. As well as providing unrivalled capacity, the system also meets exacting safety standards, with fire suppression, dust extraction and heat monitoring systems, which also extend throughout the facility onto the conveyor system to ensure the transit of this volatile material is as safe

as possible. Specialist cleaners make sure the conveyors are kept free of blockages and contaminants, and industrial magnets positioned at strategic points along the conveyor's route are used to pinpoint and remove metal fragments in the product.

To complement the new infrastructure, ABP has also invested \$22.7 million in two bespoke Siwertell Continuous Ship Unloaders (CSUs), which were transported up the Estuary by barge to their permanent home on the quayside at HIT 1. The two machines, which are used to discharge biomass vessels, work on the principle of the Archimedes' Screw, drawing the cargo up and onto the conveyor system at a rate of up to 2,400 tonnes per hour, which is almost three times faster than a crane and can make a huge difference to discharge rates in terms of speed and efficiency. The CSU system also reduces spillages and dust.

The HIT/IRFT terminal now boasts state-of-the-art rail loading facilities for both biomass and coal, loading trains with up to 24 x 70 tonne wagons in just 30 minutes and consistently achieving over 80% Right Time Departures from the terminal, which handles up to 36 trains per day. This performance was recognised at the 2015 Rail Freight Group Awards, with Immingham being named Business of the Year.

As if to underline the significance of this critical link in the UK's energy supply chain, HIT 1 recently handled the world's largest single shipment of biomass. Almost 60,000 tonnes of wood pellets were unloaded from the POPI S – the first time such cargo has been carried by a Panamax-class vessel. The ship was loaded at the Westview Terminal in Prince Rupert, British Columbia, before making the 34-day journey to Immingham.

About the author

Simon Bird joined ABP in the role of Director Humber, with responsibility for the ports of Grimsby, Immingham, Hull and Goole. Simon spent the previous 15 years as Chief Executive of the Bristol Port Company, delivering significant improvement in revenue and profit and expanding ports portfolio of customers. Prior to this, Simon held a number of senior roles at the Mersey Docks and Harbour Company, International Water and BAe plc.

About the organisation



ABP is the UK's leading port operator, with a unique network of 21 ports across England, Scotland and Wales. The company's ports include Immingham, the UK's busiest port, and Southampton, the nation's second largest and Europe's most efficient container port, as well as the UK's number one for cars and cruise. The group's other activities include rail terminal operations (Hams Hall Rail Terminal), ship's agency, dredging (UK Dredging Ltd), and marine consultancy (ABPmer). Each port also offers a well-established community of port service providers. In 2014 ABP and its customers handled 94.5 million tonnes of cargo. Together with our customers, we support 84,000 jobs and contribute £5.6 billion to the UK economy every year.

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