

CHAPTER 2

Norway and the ice

A stable cold climate that made it possible to produce ice every winter⁷⁹ was a key element in the success of the ice industry in Norway in the 1800s and early 1900s. Knowledge and technology were also fundamental and were sought abroad. In the 1840s, for example, Norwegians went to New York to acquire American knowledge and technology, and learn how to produce ice efficiently and economically.⁸⁰

As shown in Map 2-1, the ice trade was based primarily on ice from the east and southeast coasts, from the Swedish border and Kristiania Fjord (now Oslo Fjord) to Risør in the south.⁸¹ This region can be divided into two subareas: the northern area around Kristiania Fjord, where Kristiania and Drøbak were the main hubs; and the southern area from Larvik to Risør, with Brevik and Kragerø as the main centres. The region accounted for about 95% of ice exports from Norway in the 1870s, and between 98% and 100% in the period 1880 to 1930.⁸²



Map 2-1. The main Norwegian ice export area.

Source: Compiled on the basis of Statistics Norway. Historical statistics of external trade (1870–1923).

79 Ouren (1981), p. 31.

80 Weightman (2002), p. 144.

81 Statistics Norway. Historical statistics of external trade by customs office (1870–1923).

82 Ibid.

As illustrated in Figure 2-1, the two subareas of Kristiania Fjord and Larvik – Risør closely followed each other in terms of exported volume until 1900, when ice exports from Kristiania Fjord declined to a greater extent than those from the Larvik – Risør area. During the First World War, both areas' ice exports declined sharply and almost stopped towards the end. Both areas started exporting ice again after the war and continued until at least 1923, the last year with national export statistics for ice divided by customs areas.⁸³

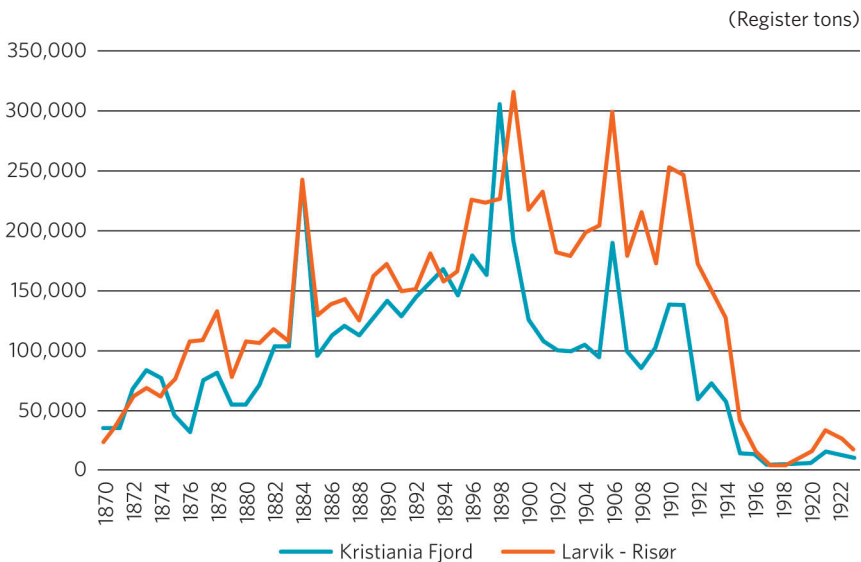


Figure 2-1. Ice exports sourced from the two main areas of Norwegian export (1870–1923).

Sources: Compiled on the basis of Statistics Norway. Historical statistics of external trade by customs office (1870–1923).

Volumes and values

The growth and decline of ice exports did not take a linear shape: as we can see in Figures 2-2 and 2-3 there were distinct peak years, which will be discussed in the following chapters.

⁸³ Statistics Norway. Historical statistics of external trade by customs office (1870–1923). The last year showing ice exports sorted according to customs office is 1923.

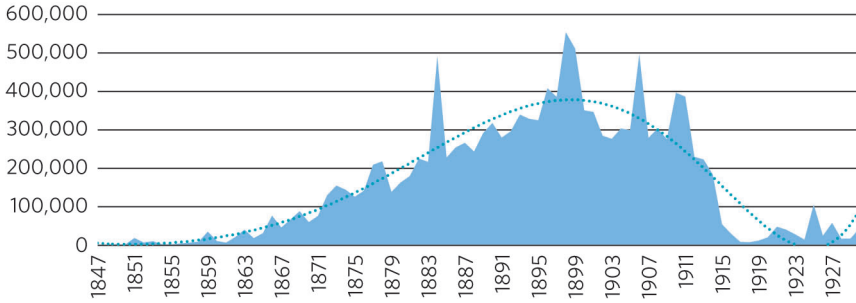


Figure 2-2. Total exports of Norwegian ice in register tons.

Source: Compiled on the basis of Statistics Norway. Historical statistics of external trade (1847-1930).

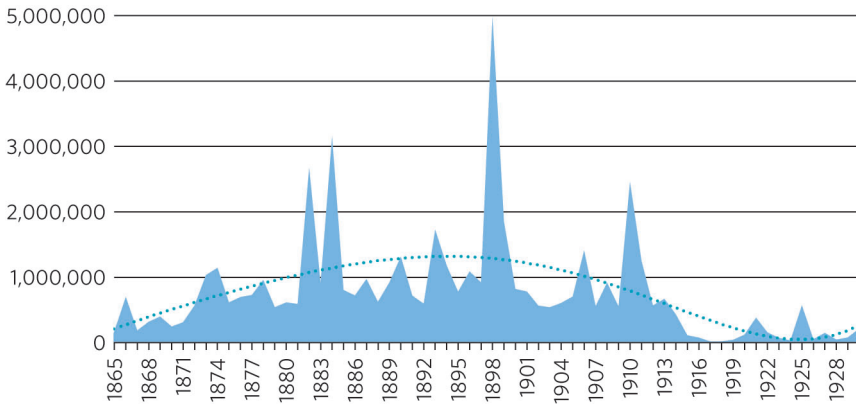


Figure 2-3. Exports of Norwegian ice. Values in NOK (1865 = 100).⁸⁴

Source: Compiled on the basis of Statistics Norway. Historical statistics of external trade (1865-1930).

An examination of the values of ice exports, shown in Figure 2-3, exhibits the same rounded trend curve as in Figure 2-2, which displays trade volumes.⁸⁵ However, there are discrepancies, with exceptionally large trade values in certain years that do not match the volumes traded. Figure 2-4 combines values and trade volumes. We see that while some of the peaks coincide, in some years the value increases but the volume does not.

84 In order to compare the values in different years, the NOK exchange rate has been adjusted in relation to 1865, i.e. how much NOK 1 in the year in question was worth in 1865 (1865 = 100).

85 Statistics Norway. Tables relating to Norwegian commerce.

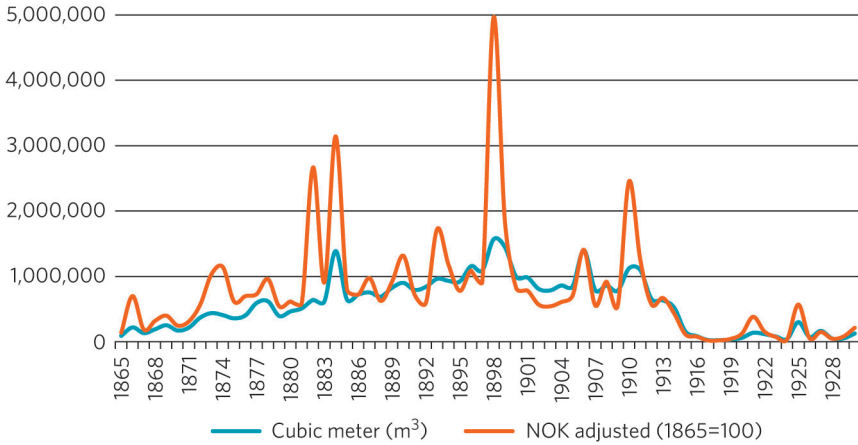


Figure 2-4. Export of Norwegian ice in both m³ and NOK (1865 = 100).

Source: Compiled on the basis of Statistics Norway. Historical statistics of external trade (1865–1930).

How can the occurrence of peaks be explained? If we examine the prevailing climatic temperatures, we see that the peaks coincided with mild winters in Europe, when local natural ice producers were unable to satisfy the demand for ice. This led to increased demand for Norwegian ice and to an increase in its volume and value. Exports to Germany increased in particular during these peak years: in a normal year, Germany was either self-sufficient or imported ice from the Alps, but when the winters were mild, large volumes were imported from Norway.

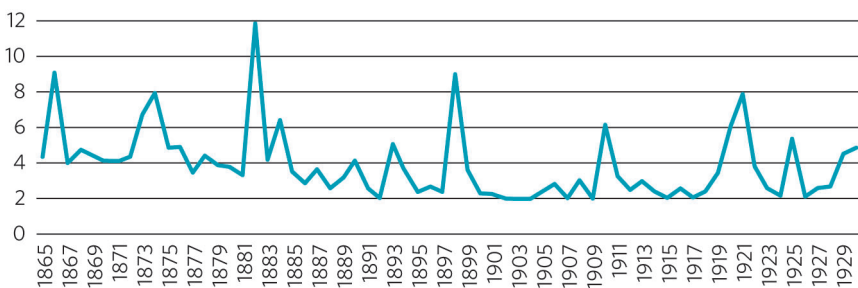


Figure 2-5. Average value of Norwegian ice exports per register ton (1865 = 100).

Source: Compiled on the basis of Statistics Norway. Historical statistics of external trade (1865–1930).

At times, mild winters made it difficult to produce ice even in Norway. This is illustrated in Figure 2-5, which shows the average value of Norwegian ice exports per register ton in the individual year. It appears

that the years when exports were greater in volume do not always coincide with the years when the ice had its highest value. Rather, the value was at the highest in the years when demand was high but production was low. Examples include the years 1866, 1874 and 1882,⁸⁶ when the winters were mild, demand was high, supply was insufficient and those ice exporters that could deliver made large profits. In other words, Norwegian ice export statistics appear to run in parallel with the theory of supply and demand: high demand and restricted supply result in the highest value of the product.

Major Norwegian ice exporters

In 1849, the ice export pioneer Søren Parr (1815–1902) started exporting from the Drøbak area,⁸⁷ and in 1850, he bought the ‘Parr estate’ where he built four ice houses.⁸⁸ In Kragerø, Johan Dahll (1830–1877) began exporting ice at about the same time. Dahll was a pioneer in ice storage and experimented with ice houses. In Kragerø, the Wiborg family also began to export ice and rose rapidly to achieve a dominant position in the trade. In Brevik, Nicolai W. Cock began ice production in 1849 and built the first ice production facility in the area in the 1850s. Cornelius Røe (1856–1910), also from Brevik, became a major exporter, operating several facilities in the local area. The Wiborg family was also active in Brevik, and it was T. J. Wiborg Snr who started up the family’s ice export business.

The Wiborg family

The Wiborg family came to Norway in the 1640s, when Christian Ohlson moved from Denmark to the newly established town of Christiansand in the southernmost part of the country. As was the custom, he took a new surname after the town from which he came, namely Wiborg.⁸⁹ The Wiborg family subsequently formed different branches.

86 Wiborg (1914), p. III.

87 Worm-Müller (1935), p. 690; Parr’s diary for 1849 in an unpublished manuscript, after Jan Wold-Hansen.

88 Egeberg (1957), p. 32.

89 Fleischer (1925), p. 10.

In the ice export context, two branches are of particular interest: the Brevik branch and the Kragerø branch. Both descend from Simon Grøtter Wiborg (1758–1847) who was a ship's master and, from 1815, merchant in Brevik.⁹⁰ Two of his sons, Simon (1803–1854) and Thomas Johannes (Snr) (1812–1874) were sent to Kragerø for education and apprenticeship in the firms H. Bjørn and I. C. Heuch.⁹¹ Simon Wiborg eventually established himself in Kragerø as general and timber merchant, and shipowner,⁹² while T. J. Wiborg (Snr) was granted commercial citizenship in Skien, Porsgrunn and other trading stations in 1838 and settled in Brevik as general and timber merchant, and shipowner.⁹³

In Kragerø, Simon Wiborg was the first of the Wiborg family to enter into ice export.⁹⁴ He was followed by his sons Simon Carl Wiborg (1834–1924) and, in particular, Thomas Møller Wiborg (1835–1918), who rapidly achieved a dominant position in the Kragerø ice industry.⁹⁵ Thomas Møller's son (Simon) Nicolay Wiborg (1867–1946) acquired his father's ships and ice business, becoming the major player in Kragerø around the turn of the century, and he was, according to the family history, for many years the country's largest ice exporter.⁹⁶

In Brevik, T. J. Wiborg (Snr) started exporting ice as a supplement to his timber business. The ice was harvested from the lake Siljantjern which Wiborg Snr had bought in 1865.⁹⁷ The dammed lake's outlet river was used to transport logs from the forest to the coast. The use of the lake was now expanded. The ice was sent down a long wooden chute from the

90 Letter from Simon Grøtter Wiborg's daughter Sophie Høegh, in Fleischer (1925), pp. 85–87.

91 *Ibid.*, p. 113.

92 *Ibid.*, p. 26.

93 Fleischer (1925), p. 46. Thomas Johannes Wiborg (Snr). He was also engaged in shipbuilding and ran a major timber business trading with the Netherlands. Dutch vessels, called smacks, regularly loaded timber at Brevik. It is recorded that forty-two smacks were loaded at the same time in 1845. A smack is a Dutch vessel rigged with two masts. It has a flat-bottomed, full-bodied hull and a submersible keel on its wide sides. Smacks were mainly used as cargo vessels. Winge (1981), p. 309.

94 Letters from Simon Wiborg to Thomas M. Wiborg, 24 March and 4 April 1851, where the export of ice is one of the topics. Attachment to Wiborg (1943).

95 Fleischer (1925), p. 29.

96 *Ibid.*, pp. 32, 34.

97 Gisholt (1947), p. 30.

lake to the coast where it was picked up and stored (at Lakseberget).⁹⁸ This became a large-scale activity that continued during the spring and summer. Wiborg Snr used Norwegian and English vessels to ship the ice to England, mainly to be sold to the fishing industry. He also chartered a number of Dutch smacks that transported ice bound for breweries in the interior of Germany.⁹⁹

Wiborg Snr was closely integrated in the local business community.¹⁰⁰ He acted as corresponding shipowner in traditional partnership shipping businesses, closely linked to his family and the local community.¹⁰¹ He was also chair of the board in the local *Fellesfløtningsforeningen* from 1847–1867, a joint association of timber merchants who floated timber along the Herre waterway.¹⁰² Both his timber business and his new ice export trade were conducted in traditional ways, firmly integrated in the local community.

After his death, four of his sons and one son-in-law all attempted to follow in his footsteps and establish themselves as large-scale ice exporters.¹⁰³

The two branches of the Wiborg family in Kragerø and Brevik were thus closely related and both were involved in ice exports. A natural question is whether they cooperated. However, it has not been possible to document a business or a private collaboration based on the material that has been reviewed in connection with this book. What is written relates to either the Kragerø or the Brevik branch, without any connections being drawn between them. In the family history from 1925, the branches are treated separately and no collaboration is mentioned. Neither is any such cooperation mentioned in an article about

98 Wiborg (1925), cited in Worm-Müller (1935), p. 693. More information about Norwegian ice exports is available on pages 688 to 705 in this volume of *Den norske sjofarts historie (Norwegian Maritime History)*. According to editor-in-chief J. S. Worm-Müller, Thos. J. Wiborg Jnr was the main source of this information.

99 Ibid.

100 Fleischer (1925), p. 46. He was the mayor of Brevik in 1846 and 1858, and a member of Parliament between 1868 and 1873.

101 For a detailed discussion of partner shipping companies and their importance in the Norwegian sailing ship industry, I refer to Hodne (1981), pp. 146–149; and Hodne & Grytten (2000), pp. 112–113.

102 Schilbred (1949), p. 108.

103 Fleischer (1925), pp. 48–50, 53, 55, 58, 59; Thomas Johannes Wiborg, Ludvig Theodor Wirsching Wiborg, Axel Quinsgård Wiborg, Halvor Nicolay Wiborg and Thomas Townshend Somerville.

ice exports written in 1914 (on the Brevik branch), nor in one written in 1943 (on the Kragerø branch).¹⁰⁴ Nor has it been possible to demonstrate any cooperation in the commercial or private part of T. J. Wiborg's archive. On the contrary, the ice exporters from Kragerø mentioned in the archive are the major competitors, who dumped ice on the market.¹⁰⁵ It has thus not been possible to demonstrate that any collaboration took place.

Thomas Johannes Wiborg



Picture 2-1. Thomas Johannes Wiborg.
Source: Sørensen (1912), p. 111.

T. J. Wiborg (see Picture 2-1) spent three years at the Emil Schreiner Latin School in Kristiania, followed by a period at a boarding school in Boulogne-sur-mer in France, before he began working for his father in 1865 at the age of 20.¹⁰⁶

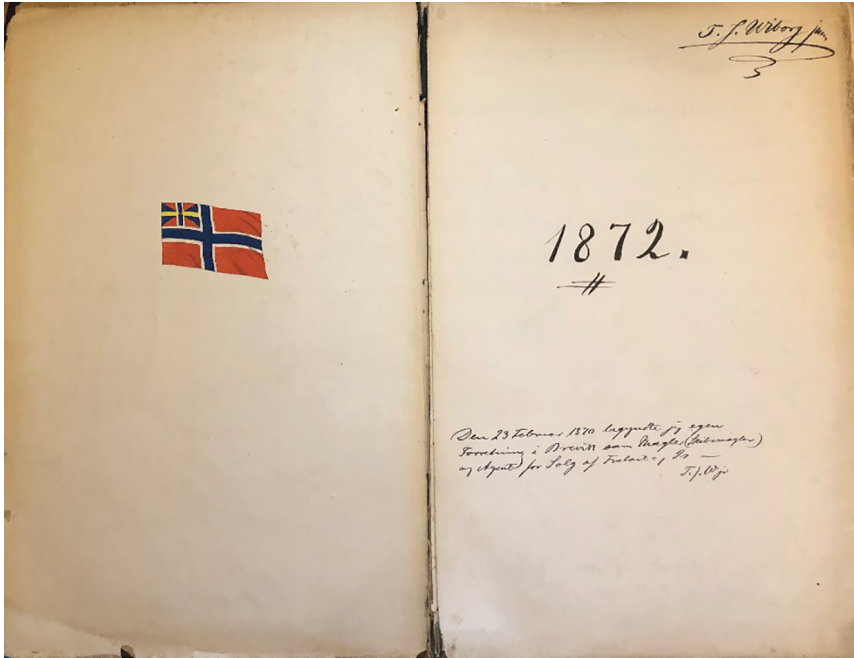
Five years later he started his own business in Brevik using the name T. J. Wiborg Jnr. He began his company's chartering journal (1872–1891) (Picture 2-2) with the following handwritten message: *'On February 23, 1870, I started my own business in Brevik as a shipbroker and agent for the sale of wooden cargoes and ice. T. J. W. Jnr.'*

Wiborg's business plan developed gradually. Ice exports were growing during the 1870s and the aim became to fully enter the ice trade, which he did in 1876. Together with his brother-in-law Thos. T. Sommerville, he established the company Wiborg & Sommerville in 1878. After going bankrupt the same year, the business moved to the capital, Kristiania, in 1879. Wiborg & Sommerville was dissolved in 1881, and T. J. Wiborg established the company T. & A. Wiborg with his half-brother Axel Q. Wiborg.

104 Fleischer (1925); Wiborg (1914); Wiborg (1943).

105 Thos. J. Wiborg Archive. Copy book (1889–1898), p. 400. Letter to Thos. Joh. Heftye & Son, 10 January 1898.

106 Fleischer (1925), pp. 48–50.



Picture 2-2. T. J. Wiborg Jnr. Chartering journal (1872).

Source: Thos. J. Wiborg Archive.

This company was dissolved 17 years later in 1898, and the year after he set up the company Thos. J. Wiborg on his own. Wiborg's son Thomas J. (Tom) Wiborg entered the company in 1910, and the company changed its name to Thos. J. Wiborg & Son. All of these companies had the object of producing and exporting ice. For the transport of ice from Norway to customers abroad, the different companies exclusively used chartered ships. In fact, Wiborg was not a shipowner until 1915.

During first World War, Norwegian ice exports declined and almost came to a halt in 1918. The shipping sector, on the other hand, experienced a wartime boom and in 1915, Wiborg expanded into the shipping sector as shipowner in the tramp trade, carrying bulk cargoes. The market for ice exports revived after the war and in 1921–1923 the company was Norway's largest ice exporter. Both the ice and shipping business were wound up in 1927. Two years later, on New Year's Eve 1929, the ice exporter and shipowner Thomas Johannes Wiborg passed away.

Provision of ice

When ice exporting first began in Norway, the common method of ice production was to collect the ice that formed on lakes, fjords and rivers close to harbours or moorings from where ships could transport it abroad.¹⁰⁷ The ice was sawn into blocks and loaded directly onboard.¹⁰⁸

From the late 1840s, these processes became more industrialised.¹⁰⁹ Blocks were now produced only in freshwater lakes, ponds and purpose-built dams. The customers demanded that the ice should be clear and clean, and work would start in the autumn to clear the water of reeds, grass and leaves in order to prevent contamination.¹¹⁰ When the water froze, the ice had to be kept free of snow to ensure the clearest possible ice and partly because the snow insulated the ice and prevented it from achieving marketable thickness. Ice quality was checked regularly throughout the winter, often every week.¹¹¹ Ice cutting started in January or February, when thicknesses had reached between 12 and 20 inches.¹¹² The ice was first cut into long strips using special cutters, often pulled by horses.¹¹³ The strips were then detached from the ice edge before being sawn into square blocks, which were loaded directly onto ships or transported to ice houses for storage. Devices such as ice chutes were used to move heavy blocks with the help of gravity from the ponds to the ice houses or shipping quays. In order to reduce the speed of the blocks travelling down the chutes, planks with protruding nails were installed at points where speeds tended to increase.¹¹⁴ The ice blocks were handled using tools such as boathooks, ice scissors, ice claws or other specialised equipment.

There were several types of ice houses. Many were built with double boarded walls and insulated in between with 6 to 8 inches of sawdust.¹¹⁵

107 Norwegian Maritime Museum. The Worm-Müller Collection. Brevik/Langesund. A note from Thomas Johannes Wiborg dated February 1926.

108 Gøthesen (1986), p. 127.

109 Worm-Müller (1935), p. 689.

110 *Ibid.*, p. 129.

111 Wiborg (1943), p. 5.

112 Gøthesen (1986), p. 113; Wiborg (1943), p. 4.

113 Wiborg (1943), p. 3; David & Norman (1994), pp. 289, 292.

114 Wiborg (1943), p. 3.

115 *Ibid.*; David & Norman (1994), p. 292.

They were often divided into several compartments, which also helped to prevent melting. So-called ice stacks or ice bins, without roofs, were also constructed. Here, sawdust was strewn across the top of the ice as insulation. Ice blocks transported to the ship directly from the place of production were known as ‘pond shipments’ and as ‘house shipments’ when the ice blocks were stored.¹¹⁶ Work in and around the ponds and storage areas was commonly carried out by local people and was described in the literature as welcome winter work.¹¹⁷

Difference between ice harvesting and (industrial) ice production

The meaning of the terms ‘harvesting’ and ‘production’ of ice is not always clear in the historical literature, where ice ‘production’ typically refers to all procurement of ice. Little is said about the type of ‘production facility’ used. Both ‘harvesting’ and ‘production’ are used to describe the overall nature of the work processes involved, but often without making clear what they mean exactly or whether they are different, and if so how. One source that can help us in these matters is the archive of the ice merchant T. J. Wiborg, more specifically his company’s lease agreements from the 1890s and its General Ledger from 1898.¹¹⁸ The term ‘harvesting’ is used when ice is sourced from ponds that have not been substantially worked prior to ice cutting. Such ponds are often known as ‘ice drifts’. The term (industrial) ‘production’ is used in connection with the sourcing of ice from ponds where prior work had been carried out. (As described above in the section Provision of ice). Where infrastructures were involved (such as ice chutes and storage houses), extensive maintenance was carried out, perhaps all year round. Ice is ‘produced’ and stored in such locations, and terms such as ‘ice establishment’, ‘ice business’, ‘ice facility’ and ‘ice plant’ are used interchangeably in connection with such sites. This distinction between the terms appears to have been supported in a

116 Gøthesen (1986), p. 131; Thos. J. Wiborg Archive, Chartering journal (1906–1920).

117 Wiborg (1943), p. 4.

118 Thos. J. Wiborg Archive. Folder marked ‘General Ledger, T. & A. Wiborg’ (1898). Folders containing copies of contracts for the lease of ice establishments, ice facilities and ice drifts.

judgment by the Kristiania City Court in 1904, when it decided that ice ponds seen ‘in isolation’ (meaning ponds that were simply harvested) did not constitute an industrial activity, while ice from ponds where infrastructure systems were involved – such as buildings for storage (stack buildings) and ice chutes for moving ice – were considered to constitute an industrial activity.¹¹⁹

Shipment of ice from Norway – sailing ships and wooden steamships

The Norwegian ice export industry was a part of the international shipping market as shippers, shipowners and charterers,¹²⁰ and the industry was almost entirely dependent on transport by ship. Infrastructure for land haulage hardly existed. Some ice was transported from Norway to Sweden by rail, but the quantities were insignificant.¹²¹ The sea was also the preferred transport route for the domestic trade, although there were instances during mild winters when ice was brought from inland locations to coastal ports for loading onto ships for export. Rail came to play an increasingly important role as the railway network expanded in the 1870s.¹²²

For many years, ice was seen as a typical sailing ship cargo, partly because it was important to transport ice in wooden ships built which offered the best insulation, and partly because of the availability of sailing ships. The sailing ship fleet was large. Even when steamships became an alternative in the 1880s and 1890s, it was still more common to transport ice in sailing ships. In many ways the first steamships to carry ice were ships that represented a transitional solution between the sailing ships built at local shipyards and the new steamships.¹²³ These were wooden

119 Siewers (1906), pp. 83–163. Judgment in an appeal hearing of 6 November 1904.

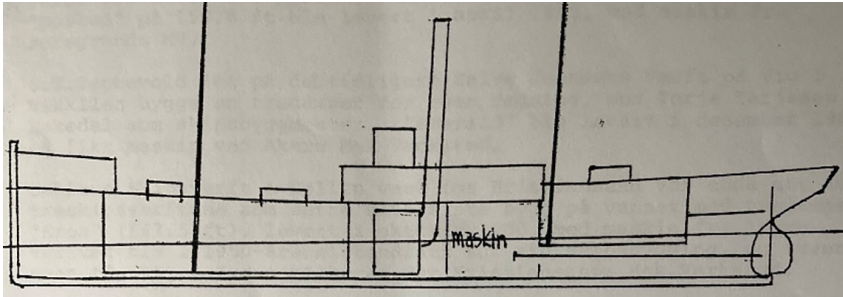
120 Ice exporters = shippers; ice exporters that owned ships = shipowners; ice exporters without own ships = charterers.

121 Norwegian historical statistics show only exports transported by ship.

122 A historical overview of railways in Norway. https://www.banenor.no/Om-oss/Om_Bane-NOR/Historisk-oversikt-jernbanen-i-Norge/

123 Bakka (1983), pp. 34–44.

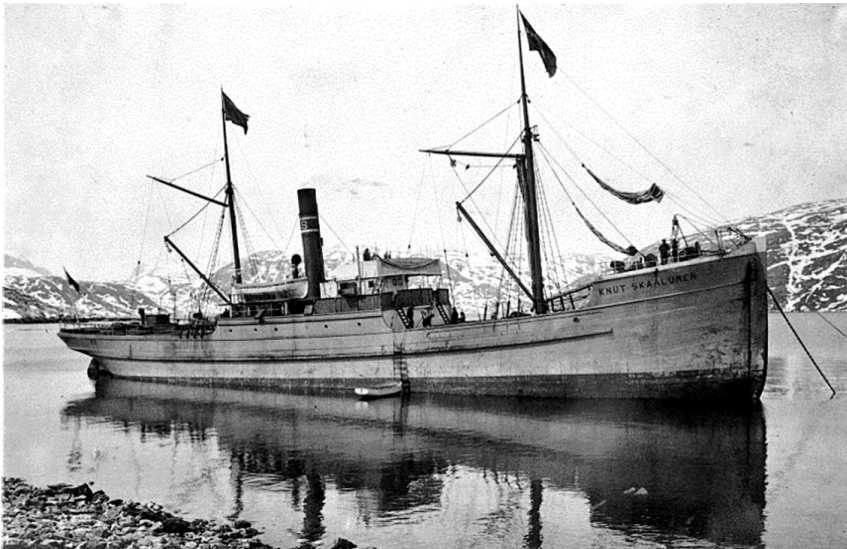
steamships, which were of a standard construction that could also be built at local shipyards for sailing ships.¹²⁴ (See Pictures 2-3 and 2-4.)



Picture 2-3. Standard arrangement of a Norwegian wooden steamship.

Source: Courtesy of Dag Bakka Jnr, Bakka (1983).

Unlike sailing ships, steamships required a package of new technology: a steam engine with essential accessories such as a boiler, shafts and a propeller. These were manufactured in mechanical workshops located in cities which had already started steamship construction and had the necessary expertise. Professional engineers were hired to install the new technology.



Picture 2-4. The wooden steamship *Knut Skaaluren*.

Source: Courtesy of the Norwegian Maritime Museum.

Standard steamships built in iron and steel were also used to transport ice, but these had to be fitted with a plank lining in order to prevent the ice from coming into direct contact with the ship's sides, decks and bulkheads.¹²⁵ Traditional Norwegian wooden sailing ships were gradually becoming redundant. They were old, there were fewer of them and, in many cases, they were not insured.¹²⁶ Figure 2-6 shows the decline in the numbers of registered wooden sailing ships in the period 1886 to 1908, both in terms of numbers and classification, where class served as a measure of the condition of the ship, with A1 as the best. However, wooden sailing ships continued to be important in the ice trade, at least until the start of the First World War. As many as 117 of a total of 133 vessels chartered in 1913 by Thos. J. Wiborg & Son were wooden sailing ships.¹²⁷

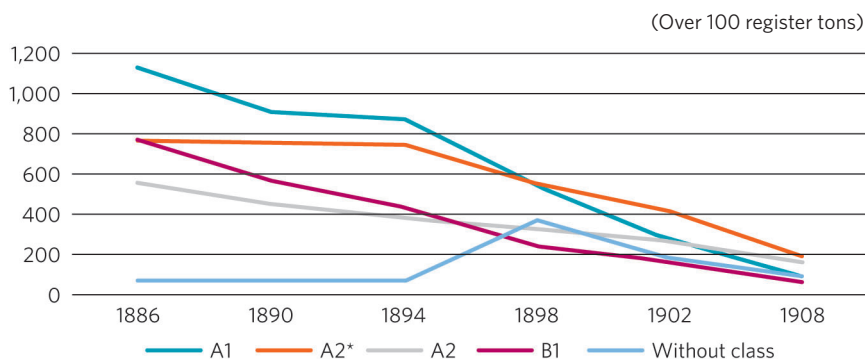


Figure 2-6. Number and condition of wooden Norwegian sailing vessels (1886-1908).

Source: Compiled from data in Den Norske Veritas ship registers.

The export of ice from Norway by ship commonly involved one of two types of contracts. The ice was either sold 'free on board' (FOB) or carried as 'cost, insurance and freight' (CIF).¹²⁸ FOB contracts entailed that the customer assumed responsibility for the ice at the loading port, while CIF contracts meant that the customer took responsibility at the port of discharge after the ice was unloaded. Under FOB contracts, a whole

¹²⁵ Worm-Müller (1935), p. 696.

¹²⁶ Worm-Müller (1935), p. 704; Ytreberg (1951), p. 411.

¹²⁷ Thos. J. Wiborg Archive. Chartering journal (1913).

¹²⁸ Gøthesen (1986), p. 158; Wiborg (1943), p. 5; Worm-Müller (1935), p. 698.

shipload was sold in register tons according to the ship's tonnage,¹²⁹ while CIF contracts entailed the ice being weighed (in metric tons) on arrival, with the recipient paying only for the quantity received.¹³⁰ It is perhaps not surprising that CIF contracts were the preferred option, not least because in the North Sea trade, between 12.5% and 17% of an ice cargo would melt during a summer voyage in a typical wooden steamship.¹³¹ Melted volumes on wooden sailing ships in the same trade were typically between 17% and 25%.¹³² Although both the steamships and sailing ships were built of wood, the voyage by sail took longer. In autumn and winter when the weather was cold, the melted volumes were generally between 3% and 4% for both types of ships. In the North Sea trade, ice blocks were loaded without insulation in the wooden ships.¹³³ The ice was stowed very tightly, right up to the beams of the deck. Over long distances, sawdust was added, and it is said that a layer of planks was placed on top of the standard deck in order to reduce melting. These planks were kept wet during transport and sold on arrival.¹³⁴

The amount of ice to be unloaded from sailing ships and steamships per day was often stated in the ice contract and in the ship's charterparty.¹³⁵ According to Worm-Müller, sailing ships carrying ice to some ports had to discharge in turn, in other words form a queue and unload one at a time.¹³⁶ This was particularly problematic when the freight was carried as CIF as the ice was weighed after unloading, and the recipient paid only for the quantity received.¹³⁷ However, we have not found this practice in Wiborg's ice contracts and therefore cannot say anything about how common this practice was.¹³⁸ In some years, the ships themselves were

129 In general, FOB contracts were common when the buyer transported the ice using his own ship and thus had control over the transport.

130 Ibid.

131 Compiled based on Worm-Müller (1935), p. 693; *Cold Storage and Ice Trades Review* (August 1905), p. 57; Statistics Norway. Historical statistics of external trade (1930).

132 Ibid.

133 Gøthesen (1986), p. 157; Wiborg (1943), p. 4.

134 Gøthesen (1986), p. 158.

135 Thos. J. Wiborg Archive. Protocol with ice contracts; Bakka (1983). Charterparty from 1900 between Axel Wiborg and the sailing ship Bertie.

136 Worm-Müller (1935), p. 698.

137 Gøthesen (1986), p. 157.

138 Thos. J. Wiborg Archive. Protocol with ice contracts.

used by London ice importers as storage ‘warehouses’ for a period prior to unloading without the shipping companies receiving any payment.¹³⁹ The practice was documented in 1891 and there were protests and demands for regulation, but it continued as late as 1907.¹⁴⁰

At the port of discharge, the ice had in some cases reached its final destination. If it was purchased by a trawling company (for the cooling of fish catches), it would be sent into cold storage before being loaded onto the trawlers bound for the North Sea. In other cases, the port of discharge served as an intermediate storage station from where the ice was loaded onto well-insulated rail wagons and sent to industrial cities inland. Here, it was purchased by ice retailers, who sold ice blocks to households as a food and drink ‘refrigerant’ for use in refrigerators or ice boxes, or to ice-cream makers, butchers, fishmongers and breweries that all needed ice to cool their products. There was a great demand for ice and, even after transport and intermediate storage, the product had to be as clear as possible and free of harmful bacteria on delivery to the end user. In other words, good hygiene and the product’s appearance both played an important role.

Brokers and knowledge of the market

The potential for adverse effects on all aspects of the ice trade, due to the uncertainties in the market during the ‘last ice age’ period, was considerable. Agreements and contracts were, at times, contested or breached, and the broker, who had market knowledge and acted as an intermediary between the seller and the buyer in a given transaction, was important.¹⁴¹ Ice was bought and sold in an international market with customers and suppliers located in different countries, and was often transported very long distances by ship. One problem was the particular nature of the product – its tendency to shrink – which challenged the integrity of contracts between sellers and buyers of a given volume. To guarantee secure

139 *Norges Sjøfartstidende* (15 August 1891, 14 May 1907); *Kysten* (22 October 1906).

140 *Ibid.*

141 <https://snl.no/agent>; <https://snl.no/megler>. The role can be compared to that of an estate agent or football agent.

contractual compliance, it was helpful if prior knowledge about the trustworthiness of the sellers or buyers was available, but this was difficult to obtain, particularly where long distances were concerned.¹⁴²

Larger concerns, such as major British and European liner shipping companies, were able to develop and accumulate this kind of expert knowledge in-house. For companies participating in the ice trade this was far too expensive.¹⁴³

Another way of dealing with uncertainty, which was common in the Norwegian shipping sector, was to draw on a variety of external third-party brokers. Håkon With Andersen has introduced the terms ‘frontline firms’ and ‘supporting groups’;¹⁴⁴ the former refers to firms that were directly exposed to market fluctuations, while the supporting groups were comprised of external partners, such as brokers, agents and consultants, whose collaboration made it easier to survive those fluctuations.¹⁴⁵

The brokerage profession came in this way to establish an international network of utmost importance for all relevant groups in shipping, owners, builders, shippers, and insurers. It became the spider in the maritime Web, sitting on the most valuable of all commodities in a business based on rapid change: information.¹⁴⁶

This applies to the ice export industry, which participated in the shipping sector as shippers, shipowners and charterers. Picture 2-5 shows an advertisement for the Christiania Shipbrokers’ Association, where they recommend shipowners, importers, exporters (shippers) and other charterers to use their services.

142 For example, in the early 1900s it could have been difficult for an ice importer in Ireland to get an overview of the ice market in Norway, information about which exporters could offer ice, what quality they could offer, at what price, if they were to be trusted, etc. Similarly, it could be difficult for ice exporters in Norway to obtain an overview of the ice market in Europe, potential customers, prices they were willing to pay, how to minimise risk, etc.

143 Nygaard (2011), pp. 52–55; Andersen (1997), p. 485.

144 Andersen (1997), pp. 463–464.

145 Ibid.

146 Ibid., pp. 482–483.



Picture 2-5. Advertisement published by the Christiania Shipbrokers' Association.

Source: *Norges Handels og Sjøfartstidende* (30 August 1917).

In the ice export industry, this kind of arrangement also helped small companies to conduct international trade and helps to explain why relatively small companies could handle large ice exports. '*... they could do so because of the very strong infrastructure on which they could rely.*'¹⁴⁷ For example, in 1906, only three people were employed in the office of the company Thos. J. Wiborg, yet 120 ships were chartered and its exports accounted for 7% of total Norwegian ice exports that year.¹⁴⁸

Ice agents

Several shipbrokers, Norwegian, Danish, German, British and Irish, also acted as ice agents.¹⁴⁹ Presumably, this combination offered both diversification and an opportunity to spread risk.

The ice agents were primarily commission agents, based in the importing country, who mediated sales for a percentage of the contract value paid by the exporter.¹⁵⁰ For instance, the company Thos. J. Wiborg paid its agents between 2.5% and 5%, depending on the type of contract, the amount of work involved and the conditions in the market. Agents did not obtain orders solely from the location where the agent company was based, but from several cities or regions and, in some cases, from more than one country. Agents set up the contracts between sellers and

¹⁴⁷ Andersen (1997), pp. 463–464.

¹⁴⁸ Thos. J. Wiborg Archive. Copy book (1900–1910). Letter to Claus Brodersen, 25 April 1906.

¹⁴⁹ Thos. J. Wiborg Archive. Protocol with ice contracts.

¹⁵⁰ This section is based on the Thos. J. Wiborg Archive. Protocol with ice contracts and chartering journals.

buyers, and also signed on behalf of either one or both parties, adding 'as by authority' or 'by telegraphic authorisation' and the name of the ice export company to their signature. Although close relationships were often established between ice agents, sellers and buyers, the agents themselves were external third parties operating independent businesses. Large importers were thus able to purchase ice via several agents at the same time. In 1906, when Thos. J. Wiborg sold six ice cargoes to the ice-cream company Messrs United Carlo Gatti and Stevenson & Slaters Ltd. of London, the transactions were mediated by three different agents.¹⁵¹

However, not all ice sales took place through agents. Wiborg, who had many well-established, long-term customers often sold directly to the importer, because both the seller and the buyer stood to benefit from cutting out the middleman.

Main Norwegian ice export markets (1840s-1900s)

Ice was exported from Norway to a large number of countries. As Map 2-2 illustrates, Europe was the main market, but ice was also transported to North Africa and Turkey. Exports to North Africa continued over a 20-year period from 1882 to 1902, although the trade to Turkey lasted only a few years.¹⁵² The US represented an even more remote export target, and deliveries were made in 1884, 1886, 1890, 1892, 1894 and 1897.¹⁵³ The record year was 1890 when 19 Norwegian ships arrived in the US carrying a total of 14,239 register tons of ice,¹⁵⁴ which was five times more than was exported to the US in 1894, the second highest year. The reason for the export peak to New York in 1890 was the relatively high winter temperature, averaging 4.7°C. For the first and only time, the winter had been so mild that it was not possible to produce ice on the Hudson River. Prices increased, making export across the Atlantic profitable for Norwegian ice exporters.¹⁵⁵

151 Thos. J. Wiborg Archive. Protocol with ice contracts (1906). Through John Goodchild & Co., Blichfeldt & Co., and G. L. Figge.

152 Statistics Norway. Historical statistics of external trade by country (1865-1930).

153 Ibid.

154 Ibid.; Worm-Müller (1935), p. 696.

155 Parker (1981), p. 3; Worm-Müller (1935), p. 696.



Map 2-2. Exports of ice from Norway (1884-1885).

Source: Compiled on the basis of Statistics Norway. Historical statistics of external trade (1884-1885).

By far the largest importer of ice from Norway was the UK, as shown in Table 2-1, with London being the largest port of import/discharge. Ice exports to the UK started in the 1840s, and the country retained its position as the primary export target for Norwegian ice up until the First World War nearly 75 years later.¹⁵⁶ In other countries, it was the incidence of mild winters with high air temperatures that stimulated demand for ice imports. For example, 1884 was a mild winter in Europe and Norwegian exports increased to a number of countries, especially to Germany. Exports totalling 150,000 register tons of ice were sent to that country in 1884 (which was two-thirds of the volume exported to the UK). Another mild winter occurred in 1898, both in Europe and Norway, with a record high export volume and a very high ice value. The warmer weather meant, as in 1884, that German domestic ice production could not meet demand and more than 180,000 register tons of ice were

¹⁵⁶ Statistics Norway. Historical statistics of external trade (1847, 1855, 1864-1918). Tables related to Norwegian commerce.

Table 2-1. Norwegian ice exports per decade, distributed by country (1870–1929)

(Register tons)

	1870-1879	1880-1889	1890-1899	1900-1909	1910-1919	1920-1929	Total	In %
UK and Ireland	1,191,118	1,961,276	2,931,661	2,461,720	919,531	84,279	9,549,585	74.45%
Sweden	1,165	13,768	26,659	12,394	64,901	86,867	205,754	1.60%
Denmark	5,105	47,890	42,104	16,551	79,095	49,330	240,075	1.87%
Germany	59,169	167,894	316,575	296,679	247,808	103,183	1,191,308	9.29%
France	81,547	145,477	240,941	238,208	139,126	49,651	894,950	6.98%
The Netherlands	26,984	98,300	38,280	66,969	13,822		244,355	1.90%
Belgium	23,407	74,886	99,304	113,429	66,693		377,719	2.94%
Spain	7,479	7,393	5,010	3,914			23,796	0.19%
Italy		6,346	3,411	2,676			12,433	0.10%
Portugal		3,513	1,442	2,053			7,008	0.05%
US		15,604	18,054				33,658	0.26%
Africa		14,003	21,918	1,500			37,421	0.29%
Other countries	2,175	2,548	829	53	2,815	565	8,985	0.07%
Total	1,398,148	2,558,898	3,746,188	3,216,146	1,533,791	373,875	12,827,046	100.00%

Source: Compiled on the basis of Statistics Norway. Historical statistics of external trade (1870–1929).

imported from Norway. Such minor or major peaks in exports caused by mild weather – or ‘mud winters’¹⁵⁷ as they were called – were quite common during the ‘last ice age’ and contributed to making the export of ice an unpredictable industry.

Cooperation in ice exports

From the 1850s onwards, cartels were common, as were shipping conferences, cartels which regulated the shipping markets.¹⁵⁸ This raises the question of how Norwegian ice exporters responded to this trading reality? Existing literature often claims that no collaboration took place between ice exporters and gives examples of firms working against each other and undercutting each other’s prices.¹⁵⁹ Such a lack of cooperation has been seen as an explanation for the fluctuating prices, high risks and erratic economic performances that characterised the industry.¹⁶⁰

157 Ice industry jargon.

158 Nygaard (2011), pp. 39–65.

159 National Library. The Worm-Müller Collection II, p. 166; Worm-Müller (1935), p. 696.

160 Worm-Müller (1935), p. 696.

The Norwegian exporters knew that their overseas customers united to work against them and that collaboration would give them an advantage. For example, at a meeting in Kristiania in 1903 it was stated that overseas customers were working together with the aim of ‘*reducing prices to a minimum*’, while at the same time Norwegian exporters were not cooperating but were, in fact, trying to underbid each other.¹⁶¹ It was also seen as problematic that large, well-organised and capital-intensive UK importers used this lack of solidarity among Norwegian exporters to dictate trading terms and conditions, especially with the smaller enterprises. (See also page 121).

But was this situation problematic for all ice exporters or only for some? The major players, according to Worm-Müller, delivered ice to regular customers with whom they had established long-term relationships and regularly negotiated prices.¹⁶² Moreover, their contracts were ‘concluded on delivery’. In other words, the contracts were signed in advance for deliveries made in the future. For example, a contract might be signed in the autumn of one year for the delivery of ice in the spring the following year.¹⁶³ Such contracts, also known as ‘forward contracts’, were (and still are) common in many types of commodity trading in non-transparent markets and were normally associated with attempting to minimise the risks for both buyers and sellers. Under such a scheme, both parties achieved a price that may not have been entirely optimal. The parties benefited a little less than they ideally would have when selling and buying at a price agreed in advance if weather conditions caused the price to rise or fall. But they lessened the risk of major losses.¹⁶⁴

Worm-Müller described this practice almost as a disadvantage because no party could be sure of how next year’s season would turn out.¹⁶⁵ Yet this type of contract was also seen as one of the main reasons for trading success, especially among the major players. The success of Søren Parr in Drøbak, for instance, has been explained by the company’s ability to combine effective production techniques with organisational improvements,

¹⁶¹ Ibid.

¹⁶² National Library. The Worm-Müller Collection II, p. 166; Worm-Müller (1935), p. 688; Wiborg (1943), p. 1.

¹⁶³ Ibid.

¹⁶⁴ Worm-Müller (1935), p. 696.

¹⁶⁵ Ibid.

including multi-year contracts with ice importers in the UK which served to divide the risk between the two parties.¹⁶⁶ Similarly, Haakon Wiborg claimed that Nicolay Wiborg, the largest exporter in Kragerø, never made a loss in any year of operation, largely due to regular deliveries to known recipients based on fixed prices.¹⁶⁷ As we shall see, T. J. Wiborg also relied on long-term customers and used ‘forward contracts’. It seems reasonable to conclude that fixed ice delivery prices were a beneficial organisational aspect, at least for some of the ice exporters.

It is also worth noting that while the industry collaborated with international buyers, there is less evidence that they collaborated with each other. Whether it would have boosted the earnings of the ice export industry as a whole had they cooperated is a possibility. In fact, some form of agreement was reached in 1893¹⁶⁸ (see also Chapter 6, page 80), but it was of very short duration.¹⁶⁹ We find the same lack of cooperation in other Norwegian industries such as shipping. At a meeting called to form a national shipowners’ association in 1880, Christian Anker, a prominent industrialist, claimed, ‘there is hardly any country in the world where people are less likely to stick together where business is concerned.’¹⁷⁰

Was the Norwegian natural ice industry important in the ‘last ice age’ period?

Perhaps not surprisingly, the ice trade was declared to be of great importance to the Norwegian economy by contemporaries engaged in the trade. ‘One can hardly think of a more beneficial export commodity than ice’.¹⁷¹ Its importance to the economy was indisputable; T. J. Wiborg, for example, proclaimed that ‘without the ice, both people and ships would have been unemployed’.¹⁷² It was an important cargo and

166 Egeberg (1957), p. 32.

167 Wiborg (1943), p. 5.

168 *Farmand* (25 March 1893).

169 *Farmand* (20 October 1894).

170 Tønnesen (1951), p. 209.

171 Worm-Müller (1935), p. 697. ‘National economics can hardly be thawed’... ‘... a more advantageous export than ice exports.’

172 Norwegian Maritime Museum. The Worm-Müller Collection. Brevik/Langesund. A note from Thomas Johannes Wiborg dated February 1926.

contributed to significant wealth creation in the shipping sector. The transport cost by ship constituted the largest item of expenditure in the ice supply chain, amounting to approximately the same value as the ice cargo itself. The contribution of ice exports to the value of Norway's total exports was, however, modest – even if it grew rapidly, it started out late and from small beginnings.¹⁷³ For example, in the record-breaking year of 1898, the value of ice exports was 2.95% of total exports, while the contributions of long-established industries such as timber and fisheries amounted to 25.15% and 28.45% respectively.¹⁷⁴ Table 2-2 shows the ratio between volume and value for ice and timber exports in the period 1894–1898, in which we can see that ice accounted for no more than between 2% and 12% of the value of timber exports. In stark contrast, ice exports amounted to between 52% and 80% of the volumes of timber exported. Compared to timber, ice was a volume-demanding, low-value commodity.

Table 2-2. Values and volumes of Norwegian exports of ice and timber (1894–1898)

(in NOK/m³)

Value in kroner	1894	1895	1896	1897	1898
Export of timber	29,050,422	29,321,010	35,581,958	42,284,489	40,076,000
Export of ice	1,084,800	715,000	1,020,300	848,200	4,706,000
Ice in relation to timber	3.7%	2.4%	2.9%	2.0%	11.7%
Volume in cubic meters (m³)					
Export of timber	1,716,311	1,674,574	1,846,098	2,095,111	1,973,822
Export of ice	930,853	920,248	1,155,691	1,091,771	1,567,751
Ice in relation to timber	54.2%	55.0%	62.6%	52.1%	79.4%
Export value per cubic meter (m³)					
Timber	16.93	17.51	19.27	20.18	20.30
Ice	1.17	0.78	0.88	0.78	3.00
Ice in relation to timber	6.9%	4.4%	4.6%	3.8%	14.8%

Source: Compiled on the basis of Statistics Norway. Historical statistics of external trade (1894–1898).

¹⁷³ Statistics Norway. Historical statistics of external trade (1894–1898). Tables of Norwegian commerce.

¹⁷⁴ Ibid. The forestry sector as a whole (timber together with wood pulp and cellulose, matches, spools of wood and turned wood products) accounted for 36.99% of Norwegian export values in this year.

Undoubtedly, the ice industry was important to shipping and to those involved in or affected by it. This applied not only to people who actively participated in the ice export trade, but also to those who earned their living working for the ice exporters or on board the ships that carried the ice. Yet as a contributor to the larger Norwegian economy the industry was of less importance.

A stable cold climate that made it possible to produce ice every winter was a key element in the success of the ice industry in Norway in the 1800s and early 1900s. The ice industry was important as year-round or winter work for many people and thus contributed to employment in the ice districts. Virtually all ice was exported by ship and it was an important cargo for both sailing ships and wooden steamships, contributing to significant incomes in the shipping sector and providing work for the seamen onboard. The ice was exported all over Europe, with the UK as the main market. Some years, ice was exported as far away as the USA. The industry grew until 1898 before it started to decline. The reasons for this decline will be further discussed in the next chapters.

