articles such as cast-iron goods". [226] Similar complaints came from the Norwegian Association of Grocers [Norges Kolonialkjøpmenns Forbund]. The dealer associations thought that the foundries should share the burdens of the strict price regulation. This could best be done if the manufacturers raised the dealer discounts, thus sharing some of their profits with the dealers.

However, the foundries were not willing to accept such an arrangement. "The foundries' profits are in fact not high enough to bear the associated costs," wrote OL in a response to the Norwegian Hardware Dealers Association in the summer of 1953. [227] A small concession was forthcoming in that the foundries were willing to increase the cash discount to the dealers by half a point. However, this did not amount to much in the big picture.

Pressure from the dealers increased over the next few years. In 1954 and 1955 OL received several enquiries from the largest dealer organisations the Norwegian Hardware Dealers Association, the Norwegian Association of Grocers and the National Association of Construction Materials Dealers [Bygningsartikkelforhandlernes Landsforening] about this situation. In addition, the Norwegian Co-operative National Association [Norges Kooperative Landsforbund] now slowly began to react. In the years after the war the co-operative associations had grown steadily in importance as dealers of cast-

It was standard procedure for a long time to operate with fixed wholesale prices in the stove industry. After 1958, however, this was prohibited. The reasoning was that such a system made it possible for manufacturers to keep prices higher than they would have been with free competition, and that this was injurious to consumers. Illustrated is a price list from the mid-1950s.

iron goods, but they also began to react to the discount policies. In 1954 the Norwegian Co-operative National Association claimed in a letter to OL that the foundries had acted "unfortunately and unjustly from a mercantile standpoint". [228]

It is clear that the foundries made a conscious effort to keep prices to consumers down, at the same time that they wanted to ensure the greatest possible profits. This was especially clear after the authorities in 1954 lifted the direct price regulations. There were then greater opportunities to pass on price increases. But the foundries wished to maintain the existing price level in order to keep demand up, as mentioned. The foundries believed that now there were signs of an incipient saturation in the market, and that a price hike could enhance such a trend.

Of even greater concern to the foundries was that a price increase might have a provocative effect on the authorities. Throughout the 1950s the price authorities began to take a closer look at the many agreements in various branches of industry. The first step was to get an overview of all the agreements that existed. Then came the question of how to deal with these agreements. There were strong indications that such agreements would be more strictly regulated in the future. This becomes patently clear in a letter which Johannes Gahr wrote on behalf of OL to the dealer organisations in 1955: "If we look at today's situation, there are requests from the Price Directorate for us to try to reduce prices to the consumer, because we are working with fixed dealer discounts and fixed retail prices... We have written a strong defence for the continuation of our agreement. It is uncertain what the result will be, when one sees the very strong campaign that has developed against agreements of this type. If we now announce that the dealer discount and the list prices were raised, we would no doubt create a hopeless situation for ourselves". [229]

By the mid-1950s there was thus increasing scepticism from many directions about the business agreements in various branches of industry. This led the Norwegian Industrial Association [Norges Industriforbund] in 1952 to support a clean-up of such alliances. For example, a so-called "agreement committee" was formed with the task of weeding out the most comprehensive agreements, "so that justifiable objections from a general standpoint could not be raised". [230] OL, however, did not want to participate in such an "enquiry" because the association did not think that the agreements in the stove industry were harmful to consumers. But in 1953 the Price Directorate decided to investigate the financial conditions in companies that participated in price agreements, in order to uncover the extent to which co-operative agreements led to higher profits. In this connection the stove foundries were also investigated, but here no basis was found for intervening in the agreement system, and the existing agreements were approved with some minor adjustments. [231]

In the long term the trend was towards stricter regulation of such agreements. As far as the price authorities were concerned the focus was eventually directed at those types of agreements that gave the manufacturers the right to regulate prices and/or profits with middlemen – so-called gross price agreements. It was such a principle on which the dealer agreement in the stove foundry industry was based.

In the autumn of 1954 the Price Directorate raised a number of critical questions related to gross price agreements. Some months later the directorate presented three alternative proposals for how these should be regulated. All of them had to be regarded as radical from the point of the view of the companies. The first involved imposing a general prohibition on manufacturers to stop them from operating with either binding or suggested retail prices. The second was based on a prohibition only against binding regulations. The third was based on a solution which gave the price authorities the right to intervene in the event of "improper vendor regulations" of prices or profit margins. [232]

The stove foundries were of the opinion that the agreements within the industry were not harmful to consumers – quite the opposite. In a commentary to the proposals from the Price Directorate, OL wrote: "The dealers' profits are held as low as possible, and they have strong competition amongst themselves to serve construction clients in the best possible way. Amongst the stove foundries as well, competition is always lively, since the individual prices vary and there are always new models appearing... It is our conviction that the rapid development which the agreements in question have allowed our stove industry to participate in has proved equally advantageous for all those who use our important products, as well as for the industry itself. The foundries are still in the midst of a rapid process of development, and it is essential not to stop it." [233] A dissolution of the dealer agreement would also mean that the foundries' stove agreement would have to be dissolved. This would be harmful to the entire industry, causing it to lag behind in technological development. Consequently it would have a harmful effect on consumers, who would encounter more expensive and poorer products. In other words, there was a close connection between the interests of both manufacturers and consumers.

"Supplementary stove" in white enamel. This was one of the first stoves that was clad in enamelled plates. The objective was to facilitate cleaning and also give the stoves a more modern look.

The Price Directorate worked on this case for almost a year and a half before a decision was finally handed down in the summer of 1956. At that time the Directorate presented two alternative solutions. One comprised a selective arrangement based on allowing the Price Directorate to determine all gross price agreements, and possibly prohibit them as well if they ran counter to "the interests of society". The second was based on a general prohibition, but with the opportunity for individual suppliers to give dealers "guidance with respect to pricing, profit margins or trade terms". Associations or groups of suppliers should not, on the other hand, have the opportunity to conduct co-ordinated guidance without the express permission of the price authorities. [234]

In this connection OL repeated its earlier arguments. In addition, the advisability of a prohibition was questioned. "The result will... impact all parties: the foundries, their workers and officials, and the public. In this situation the only ones who might benefit from dissolving the 'gross price system' for cast-iron stoves would be the dealers. And that was probably not the point," wrote OL in a commentary to the proposals. [235] Now another argument had emerged. Only a few weeks before the proposal was made public, more precisely on 1 July 1956, cast-iron stoves were put on the exempt list. Such products could now be freely imported, something the stove foundries had been convinced would happen. No doubt Danish stove foundries, among others, did not have a big enough market for their products as a result of low construction activity, and so it was expected that they would now turn to the Norwegian market. For that reason it was imperative for the stove foundries to set prices as low as possible.

However, there was not much support to be found for such arguments. At the new year 1957 Stortinget [the Norwegian parliament] adopted the proposal for the prohibition against binding and guideline collective supplier regulations and against similar binding individual regulations. However, the prohibition did allow for dispensations. The Price Directorate could make exceptions when special considerations of social or other character presented themselves. The stove foundries used the opportunity to seek dispensation from the prohibition, but without success. So the dealer agreement had to be dissolved as of 1 May, and the foundries switched to net pricing.

In October 1958 a committee was formed, led by Gahr, which was to work out proposals for a new agreement that would regulate the relationship amongst the manufacturers. The committee proposed a system in which the dealers were divided into groups according to turnover, and eligible for

Almost an electric stove... In the 1950s Jøtul focused on giving its wood cooking stoves a modern look in line with electric ranges. Cooking was the area in which the traditional stoves first lost ground to electricity.

bonuses from their suppliers depending on the size of their turnover. It was proposed that dealers with an annual net purchase of less than 50,000 kroner should receive a 16 per cent "bonus", while those with purchases above this level should receive 20 per cent. As we see, the system operated on the same principle as the stove agreement. The most important difference was that the discount was replaced by a bonus after the sale, while at the same time the sales volume became the basis for the calculation instead of geographic location. In this way the new proposal also included an incentive for the dealers. However, it was difficult to create unity amongst the manufacturers regarding such an arrangement. The smaller foundries in particular were sceptical. They did not have access to the large dealers, and thus would be put in a worse position with regard to the bonus arrangement. Nor would the Norwegian Hardware Dealers Association, which primarily organised the larger dealers, back the proposal. They thought the differentiation was too general, and that more specific differentiation would have to be made between the dealers who kept inventory and those who only sporadically made deliveries to building associations and the like, yet could have significant turnover. [236]

The lack of unity laid the groundwork for the quick demise of the stove agreement. This was because Jøtul chose to bow out. In January 1959 the company announced that as a result of the lack of desire to create a new manufacturers' agreement, Jøtul was withdrawing from the arrangement. The other participants in the arrangement were at the same time informed of the discount schedules that Jøtul would use with its dealers. Other foundries could "adapt for themselves" these schedules "insofar as it was possible and they found it desirable". [237] Because of Jøtul's withdrawal, the other six participants found that there was no longer a basis for working out any new agreement. Jøtul had become so dominant that an agreement would have no effect if this company did not participate. The agreement was therefore dissolved effective 1 February 1959. This meant that the stove industry for the first time in almost thirty years was completely without industry regulation.

Jøtul's withdrawal – and the subsequent reaction of the other foundries – indicates quite clearly the position that Jøtul had now assumed in the industry. As early as 1947 the company had a market share of about 25 per cent. By 1951 that share had climbed to 35 per cent, and towards the end of the decade it had topped 60 per cent. In the 1950s Jøtul had an annual production of approx. 6,000 tonnes. This meant that it was not merely the undisputed largest stove foundry in Norway, but also the largest iron foundry as a whole. [238] From the standpoint of production technology and products, an ever-widening gulf had opened between Jøtul and the rest of the industry. In 1930 Gahr brought with him into the industry-wide co-operation a company that did not differ materially from the other major stove foundries. Upon leaving the co-operation in 1958 he took with him a company that in important aspects far exceeded its competitors.

By the end of the 1950s Jøtul's market position had become so strong that it could get along fine without co-operation amongst the manufacturers. Indeed, the company was now actually best served by standing alone. In this way it could design its sales terms independently of the rest of the industry. First, Jøtul no longer had interests that coincided with its competitors in price and discount matters. Second, in the late 1950s there were other conditions that favoured independence. The trend was towards an increasing liberalisation of international trade, and increased competition from abroad had to be anticipated. This also favoured Jøtul's independent stance. The situation was indeed marked by a certain irony. It was Johannes Gahr who had promoted co-operation within the foundry industry in the inter-war era. A good thirty years later it was the same man who gave co-operation the coup de grace. Gahr was eager for co-operation as long as it benefited Jøtul, but withdrew when it began to work against his own interests.

The threat from new energy sources

In 1958 the industry journal Byggmesteren [Master Builder] wrote: "It is interesting to note that the modern cast-iron stoves and fireplaces make up the most significant portion of home heating in the explosive housing construction that has taken place since 1945, and thus continue to dominate Norwegian home heating. Modern cast-iron stoves and fireplaces are used because they are very reasonable to acquire, are very economical and utterly reliable in operation, and can be obtained in size and appearance to satisfy taste and comfort." [239]

It was correct that the traditional cast-iron stoves still played a central role in home heating at the end of the 1950s. And even new housing was still almost always equipped with the option of heating with wood or other solid fuel. At the same time there was no doubt that the traditional stoves and fireplaces were on the retreat. Indeed, wood- and coke-fired stoves were in 1960 still the primary heating source in 70 per cent of private residences in Norway. [240] But these figures concealed a change that was not caught by the statistics. It was seldom that a residence instantaneously switched over from solid fuel to electricity. The inroads electricity was making in home heating comprised a gradual process. New electric stoves were installed sporadically, in keeping with new requirements, until they eventually took over the majority of home heating.

Soon after the war, electricity began to threaten the stove foundries. Shown are blocks of flats in Etterstad in Oslo under construction in 1946–47. These flats were equipped with full electric heating.

Stove industry professionals had long been aware of the threat from electricity. For example, as early as 1945 Johannes Gahr viewed with concern the fact that new housing in Oslo was relying on electric heating to an increasing extent. This development, he thought, would only be strengthened as Oslo Light Works [Oslo Lysverker] completed its large expansion of power capacity.[241] Gahr's concerns were absolutely justified. Before the Second World War, Oslo Light Works had already begun to increase the consumption of electricity for home heating. And just after the end of the war a goal was set for all residences to be heated electrically over the long term.[242] Jøtul had already noticed some competition from electricity. For example, the company had not succeeded in obtaining deliveries to Oslo Building and Savings Association [Oslo Bolig og Sparebyggelag] in conjunction with housing construction in Etterstad in 1946–47, despite the fact that Jøtul had presented a very favourable bid. In OBOS the desire was for electric heating.[243]

However, things did not proceed the way many enthusiasts of electricity had imagined. During the first years after the war, a severe shortage of electricity occurred all over the country. This led to rationing of electrical consumption in most places, and in such a situation it was heating that took a back seat in terms of priorities. This was nevertheless an area in which there were good alternatives.[244] For example, in Oslo for a number of years housing construction was required to have combined solid-fuel and electrical heating.[245] And in the countryside woodstoves continued to hold their own as the most important heating source, because there was an abundance of wood, and electricity was usually more expensive than it was in the cities and the supply network was often inadequate.

Conservation measures were still a concern until the mid-1950s. From then on, demand for traditional stoves and fireplaces began to fall steadily. The decline was related to the fact that housing construction was slowing down. But even more important was the fact that the supply of electricity became more abundant and the rationing impositions less stringent. In addition, electricity remained inexpensive; for the country as a whole the price of electricity barely rose in the first fifteen years after the war.[246]

The stove industry attempted for a time to mobilise its defences. In 1954 OL began a co-operation with the National Association of Norwegian Coal Importers [Norske Kullimportørers Landsforening] regarding co-operative advertising for firing with solid fuel. A co-operation was also established with the Norwegian Forestry Corporation [Norsk Skogselskap], which wanted to promote the use of forest thinnings, wood and sawmill waste in home heating. Finally the association decided in 1954 to hire its own "publicity man," civil engineer Håkon Rygh. Rygh was hired part-time to carry out an educational public relations campaign about solid fuels. In ensuing years he published a number of articles on the subject in newspapers, magazines, and technical and industry journals. For several years he also gave a lecture series on National Broadcasting [Norsk Rikskringkasting] about efficient and economical home heating.

Rygh was the spokesman for a principle called "combined heating", that is, firing with solid fuel supplemented by electrical heating.[247] Because several alternatives were built in, the system was prepared should one form of energy become scarce. Rygh also did propaganda for this concept amongst architects. He had support for the concept amongst leading entrepreneurs, including the young, inventive developer Olav Selvaag, who had been installing combined firing in his dwellings for quite some time.

However, they were fighting a losing battle. The combination argument eventually lost its force as the electrical supply became more abundant and reliable. And by the end of the 1950s not even the price was an argument that unequivocally supported stove-firing. While the prices for cordwood measured in fixed prices rose by 50 per cent over the 1950s, the cost of electricity remained about the same in 1960 as it was ten years before. The fact that electricity could compete in price with wood and coke was emphatically confirmed for many companies, including Jøtul. In 1958 the company joined with the Norwegian Construction Research Institute [Norsk Byggforskningsinstitutt] to study the costs of heating with solid fuel versus electricity. Jøtul's worker residences in Manglerud, which naturally were equipped with stoves, were compared with a selection of similar residences in Bestumkilen that were heated electrically. The leader of the study was one of the country's foremost experts in heating economics, civil engineer Hallvard Hagen. He concluded that at current levels, electrical heating was less expensive than stove firing. [248]

But perhaps equally disquieting as the cost result were the other advantages of electrical heating pointed out by the report. As the conclusion stated, "The most important factor one must consider when evaluating energy prices of electricity versus traditional fuel, is the work required by the heating. In electrical heating, where all one must do is turn a knob, the work is insignificant. When heating is based on stove firing, there will be considerable extra work involved with firing in two stoves, for example, throughout the entire winter, work that is difficult to express in kroner and øre. Add to this the drawbacks of letting the doors stand open to the rooms without stoves in order to heat those rooms. Even then the heat distribution in the room could be less than favourable, with high temperature up toward the ceiling, and low temperature and a draughty sensation down by the floor." [249] The traditional stoves and fireplaces thus had a number of user drawbacks compared with electricity. And if the price was the same, it was not difficult to predict what the obvious choice for most people would be.

Switching over to kerosene

How then did Jøtul react to the threat that lay in the competition from other energy sources?

Early on, the company made a decision to play an active role within the new heating sectors. In 1961 Jøtul began producing electrical panel heaters. In this case the objective was not to switch completely to such production, because it lay too far from Jøtul's core expertise. Rather the idea was to build further on the combination aspect. Stoves and fireplaces for solid fuel would be sold together with electrical panel heaters in "packages". In this way the disadvantages of wood and coke stoves – primarily that they could not be "divided up" – were offset by supplementing with panel heaters in individual rooms.

The production of electrical panel heaters was located in Halden, and the scope of production eventually became quite extensive. By the mid-1960s Jøtul had about 10 per cent of this market in Norway. However, this part of the production was never properly integrated in the rest of the product range. First, this was due to the fact that the company had to go through different sales channels from the ones Jøtul traditionally used. Second, there was the fact that the combination of wood and electricity did not catch on. Finally, there was not much profit to be made in this area. Large international electronics groups gradually began to dominate this market, and Jøtul could not compete with them either in production efficiency or sales efforts. The production of panel heaters continued, however, until 1979, but in later years played an utterly insignificant economic role.

The mainstay of Jøtul's product range would eventually become another energy source: kerosene– or petroleum, as it was called at the time. Even before the sales of stoves and fireplaces for solid fuel began to decline, Jøtul had begun to develop solutions based on liquid fuel. The company was not alone here, since several other foundries were doing the same. However, Jøtul was the only manufacturer that eventually developed a complete concept in this area. Kerosene burners and stove models were developed and constantly redesigned. At the same time, all the central parts of the sales network, from the sales department to dealers and installers were integrated in the company's market strategy in this area. This combination of product development, marketing and dealer integration proved to be a very powerful formula when the market for kerosene heating expanded in the 1960s.

Early on, Jøtul began to focus on kerosene solutions, and gradually the company took the lead in Norway in this area. Jøtul took such an early initiative and eventually managed to create a dominant position in this sector largely because the company had built up a strong product development environment quite soon after the war. The most important practical move in this regard was the establishment of the company's own development department in 1949. The main task of this department was to do product development, and it was put under the leadership of engineer Knut Tronstad. [250]

After being designated a separate department, product development became a continuous and systematised process, instead of a task that occurred more haphazardly as in the past, and in fits and starts. This was presumably a major reason why Jøtul became so strong in product development in the following period.

In 1953 Jøtul began considering liquid fuel. In this area the company was far in the vanguard of the market. Kerosene was at this point rarely used as fuel for heating in Norway, primarily because kerosene was expensive, but also because there were no good burners available. Kerosene had not yet assumed any great importance even internationally for heating. In a country such as the United States, kerosene burners had indeed been for sale since the 1920s, but for a long time they were not widespread. Only after the war were there signs of a breakthrough in this area in the United States, primarily as a result of new and better burners coming on the market while at the same time kerosene prices dropped. [251]

Jøtul placed great importance on design in the production of electric panels as well. These models received many prizes for design excellence both in Norway and abroad. Still, Jøtul never became a large-scale manufacturer of electric heaters.

The Jøtul burner was launched in 1956. In subsequent years thousands of units were sold annually. Jøtul gradually developed more sophisticated supply systems for the fuel.

In the early 1950s, in other words, it was not a given that kerosene would have any great significance in Norwegian home heating. Why then did Jøtul nevertheless decide to focus on this area?

Apparently, consumer concerns were the main reasons that attention began to be paid to kerosene solutions. Kerosene was much easier to handle than wood and coke, and the burners were much less labour-intensive. For one thing, kerosene burners did not produce ash or other waste that had to be cleaned out regularly. Moreover, they provided greater opportunities for regulating the heat emission. While stoves and fireplaces for solid fuel gave off an intense heat, the kerosene burner could be specifically set within a rather large temperature range. It was thus suitable for both small and large rooms. From this point of view, kerosene could be said to share some of the properties of electricity.

However, the focus on kerosene burners was also dependent on technical production conditions. The only thing that in practice distinguished a stove for solid fuel from a kerosene stove was the burner itself – or the work involved. In other words, production of kerosene burners made only minimal demands on conversion or renewal of the production apparatus – to a large extent one could build on established know-how and production patterns.

During the development of the first kerosene burners, Jøtul was largely making use of known technology. There were two types of burner – the pot burner and the cup burner. Jøtul focused on the cup burner since it emitted the least exhaust gases and smell. However, Jøtul also added something new to this technology. They designed their own solution for the kerosene supply, based on a separate container equipped with a special float system. Thus the burner could be charged automatically 24 hours a day with the desired dose. This meant less work for the consumer, and with its own regulator the heat output could be regulated from 800 to 7,000 watts. [252] Jøtul took out a patent on the supply system and thus was the only company with this solution.

The kerosene burner – or the "Jøtul burner", as it was called – was launched in the spring of 1956 and had a hugely successful start. "Oil burners are very popular", wrote Arbeiderbladet in the late summer of that year. [253] In an interview with Jøtul the newspaper learned that 180 units were produced daily, "and they just fly out the door", it was said. Sales were no doubt boosted considerably by the dramatic situation in the electrical supply during the previous winter. That winter had been one of the harshest since the war, with long periods of blackouts and rationing. And as a result of the shortage of electricity, the demand for coke and wood had driven up prices. This had also contributed to stimulate interest in new alternatives.

But many people also saw great consumer advantages in the "Jøtul burner". In addition, the system could be purchased as a stand-alone system. The burner, tank and accessories were sold in a package, so the system could be installed in existing wood or coke stoves. In this way the entry price into the new technology was affordable for most people.

There was obviously a big market for kerosene burners. During the first year and a half alone, Jøtul sold about 20,000 units. The company soon began to offer all stove models with kerosene burners, although the consumer still had a choice. The burner could simply be removed if one wished to fire the stove with wood or coke.

A crucial step in the direction of flexible solutions was taken with the launch of the so-called "combination stove". This stove was designed with two separate chambers; the lower one was equipped with a kerosene burner and the upper was intended for wood firing. The stove could be fired with kerosene and wood separately or simultaneously. In 1958 a combined fireplace and kerosene burner was also launched. And in 1959 came the first cooking stove with combined wood and kerosene firing.

The combination stove was the first stove to be marketed with the possibility for an outdoor supply system. A system consisting of a pump and a proprietary dosing device made it possible to supply the kerosene stove from a container outside the house. In this way it was possible to move fuel storage completely outside the house, or even underground in large tanks if desired. This meant that kerosene firing had become almost labour-free, especially if one chose a full-year tank. One filling per year was enough; the dosing device, the "oil automat", regulated the supply. All that was required was to set the thermostat to the desired temperature. "Just push a button once in the fall – and you have Jøtul heat all winter long", was the advertising slogan.

The automated kerosene systems had many of the same user advantages as electric heating. They also provided a feeling of security. Energy for an entire season was stored securely in the back yard at home, as opposed to electricity that could be cut off as a result of technical problems or power shortages. However, these kerosene units were much more expensive to purchase, and they were only economical in larger residences and buildings. This was the main reason why it took time for them to become widespread. Not until well into the 1960s did they become truly popular. Increased residential size and lower prices for kerosene and oil were presumably the most important reasons. At the same time, new sales strategies were developed. In 1964 Jøtul entered into a co-operation with the oil company Shell to finance such installations. Jøtul provided the unit, while Shell delivered the fuel and financed the installation. The consumer paid only 10 per cent cash, and the rest could be paid off in instalments. This solution was very popular in the latter half of the 1960s. [254]

By the start of the 1960s, then, Jøtul had developed a range of models adapted to liquid fuel. The company was largely the only one to do this in Norway, and it was therefore in a very favourable position when the market for liquid fuel stoves and fireplaces began to expand in earnest. By 1960, 13 per cent of Norwegian households had installed kerosene, and by 1970 the number had climbed to 31. But in reality the expansion was even greater, since kerosene was often combined with wood or electricity. This is evident if we look at the increase in kerosene consumption for the same period, and Jøtul was the major supplier.