Looking to the EAST

In addition to its traditional areas of operation, Oilon is closely involved in the growing Eastern market.
Oilon is a private Finnish group founded in 1961. In Finland the group includes the administrative parent company, Oilon International Oy, and the subsidiaries Oilon Oy and Oillon Energy Oy, which produce oil and gas burners. The Finnish organisation also includes Geopro Systems Oy which develops and markets ground source heat pumps, and Ecopower Technology Oy which specialises in pressurised combustion systems.

The company’s foreign offices include sales offices Oilon GmbH in Germany, Oilon Polska Sp.z o.o. in Poland, OOO Oilon in St. Petersburg, Moscow and Ekaterinburg in Russia, and Oilon China Ltd. in Hongkong and Wuxi in mainland China. The Chinese production company, Oilon Burners (Wuxi) Co. Ltd., delivers industrial burners mostly in China and other Asian countries.

Their EUR 35 M turnover is generated by some 240 employees. Oilon has representatives in most European countries as well as Asia, Russia, North and South America and some African countries.

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Welcome once more to Oilon Flame, Oilon's newsletter presenting Oilon International Oy, our products, projects and development efforts. We take great pleasure in telling you about our achievements in energy production and environmental issues, achievements that we share with our customers. Thank you for your interest. We believe that these pages will also give you ideas for improving your own work and life - and maybe we can help you realise your dreams.

Over the last few years, Oilon has advanced at a fair pace and the expansion of our sales has clearly outpaced market growth. Thank you for that. Indeed, our sales have increased so quickly that the period of strongest growth led to occasional delivery delays. We apologise for the inconvenience this has caused and are happy to be able to tell you that matters have been remedied with brisk improvements.

Naturally we have recruited new employees for production management, purchasing, customer relations, design and of course production. Production facilities have also expanded by 2500 m² in Finland, and in China we have 1500 m² of new space for storage etc. With these increases in employees and production facilities, our deliveries are once again as highly reliable as ever. Thank you for your patience. Your loyalty is important to us, and we want to demonstrate our appreciation by improving our operations quickly.

The increase in customers, the need to lower emission levels and new demands on automation present new but welcome challenges. We cannot be satisfied with the current situation, although coming even this far has required a solid long-term partnership with you. Our customers’ enthusiasm for improvements has once again encouraged us to make significant investments in product development. You may remember that we built a highly modern production development centre in Lahti in 1996. The centre provides 1600 m² of space equipped with world-leading technology. Now we have decided to build another 1000 m² of similar facilities, and at the same time we are investing further in computational fluid dynamics and combustion modelling. Our development centre provides excellent conditions for studying the combustion of different oils and gases. Our heat pump technology development will also move to larger, better facilities. We are very excited about this new development investment which will give us a better chance to realise the improvements that our customers expect from us.

I have the pleasure of working with a very customer-oriented staff who always wants to fulfil the customer’s desires. Thus it is very important that we can now implement such extensive changes in production and product development. We will become an even better partner for those who want to work with us to carry out our mission to produce energy in a cost-effective, environmentally friendly way that achieves high customer satisfaction.

Thank you once more for our excellent partnership. We hope you enjoy our newsletter!

Oilon International Oy

Eero Pekkola
The Finnish capital recently saw the launch of the new auxiliary and peak heating plant of Helsinki Energy. In the winter of 2006, Oilon delivered five new RT-50 L heavy fuel oil burners to the new boiler plant. The boilers were delivered by KPA Unicon Oy from the town of Pieksämäki, Finland.

The plant is located near a residential area, which made the delivery challenging. Accordingly, steps had to be taken from the very start to ensure minimum environmental impact. At plant design, particular attention was paid to possible noise impact.

“The installation and testing phase is now over and the plant has been ready for use for some months. The boilers are still being warranty tested, but based on advance information, everything about them looks good,” says Pekka Iso-Herttua, Head of the Projects Department at Helsinki Energy.

The new boiler plant replaces five old heavy fuel oil burners dating back to the 1960s. Advances in boiler and especially burner technology in recent decades guarantee significantly lower emission levels from the new plant. Pekka Tuominen, the Oilon Project Manager responsible for the delivery, is glad that the burner delivery went as planned also in terms of emissions.

“The partnership between the end customer, the boiler supplier and the burner supplier in this project was excellent. We were able to join project planning at an early stage and participate in the dimensioning of the furnace, which made it easy to achieve the required emission levels,” says Tuominen.

Helsinki Energy also appreciates the good communications.

“Collaboration with Oilon was easy. Whenever we needed help, it always arrived quickly,” says Iso-Herttua.
More and more waste dumps collect biogas for future consumption

Even though many Finnish waste processing plants are already designed to provide biogas for energy, there is still much untapped energy potential to be found in many waste dumps. The refuse disposed at waste dumps creates biogas as it disintegrates anaerobically. Environmental legislation requires that the gas generated by waste dumps must be collected and at the very least incinerated, because the gas contains methane, a powerful greenhouse gas.

Oilon has already participated in many biogas collection projects in Finland and all over the world.

“Oilon has delivered gas burners for burning waste dump biogas for a long time. But even Finland still has waste dumps where biogas is not utilised. Thus there is still a lot of untapped energy potential,” says Kari Puro, Sales Manager at Oilon.

Biogas is collected from the landfill by sucking it in through a network of pipes built among the refuse. There are two common collection methods: drainpipe wells and horizontal drainage lines.

A successful biogas collection project is located in Central Finland, where Jyväskylä Energy started to utilise the biogas produced by the city’s waste treatment plant last year. Oilon participated in the project by delivering the burner for incinerating the gas in the Keltinmäki boiler plant.

The testing phase of the project is now over and the equipment’s fine-tuning is complete. At the start of the testing phase, it was estimated that there would be enough biogas for the annual needs of 350 households. However, the amount of gas collected at the dump has exceeded expectations, and now there is enough for over 500 households.

At the Mustankorkea waste treatment plant, the pressurised gas is piped to the Keltinmäki boiler plant, where it is incinerated and utilised as district heat. Burning biogas is odourless. Biogas combustion forms a much smaller amount of carbon dioxide than when using, for example, heavy fuel. The project supports Jyväskylä Energy’s attempt to increase the utilisation of renewable energy sources in energy production and Mustankorkea’s attempt to enhance waste utilisation and reduce the environmental impact of landfills.

Oilon participates in the Russian project to destroy chemical weapons

Russia is a large country and offers diverse delivery sites. One of the most interesting and exceptional projects started in February 2006: Oilon was asked to deliver several burners to a plant that was being built in the city of Kambarka for the purpose of destroying Russia’s old chemical weapons.

The Kambarka plant, now in its final stages of construction, has attracted a great deal of attention from the government of the Russian Federation, and the United States partially funds the project. The project is part of the current Russian programme to destroy chemical weapons.

Oilon delivered four GKP-90 H burners for steam and water boiler plants to the Kambarka industrial area and two GKP-500 M burners to the nearby military area. In addition, two GKP-90 H burners were installed in the local fire brigade’s facilities. The burners were installed in LOOS boilers.

Oilon’s long-term partner, the Bryansk installation company TeploServis, installed the burners. The chemical weapons disposal plant itself uses unique refining technology to convert lethal and toxic substances into harmless products. Oilon’s burners are needed to produce the steam required by the process.

“Oilon’s burners are very safe for use even at the most hazardous sites,” says M. I. Dyskin, the chief expert at TeploServis.

Right now, Beijing is preparing to organise the 2008 Summer Olympics. The forthcoming games have also accelerated air cleaning in the city. Beijing has traditionally been heated with coal boilers, causing unpleasant dust and pollution problems for the whole city. Thus the city adopted the goal of replacing coal entirely with natural gas by the end of 2006. The transformation is progressing well, and Oilon has been an active participant in helping Beijing to clean its air. At present, 2000 MW of thermal power have already been delivered to the Beijing district heating sector. The latest delivery was made to Beijing Zhengdong Electronic Power Group Co. Ltd. The delivery included Oilon’s Low-NOx burners, which were installed in four hot water boilers of 58 MW each.
The Viken Fjernvarme district heating plant, located in an Oslo suburb of Skøyen produces district heat for the Norwegian capital. It has needed more district heating capacity for a long time. However, finding a suitable site for the required district heating plant in this busy city has been difficult.

It was decided to place the new boiler plant in an old transformer station located nearby. The cramped space in the building posed a challenge, because Viken Fjernvarme, responsible for heat distribution, required that the building needs to be able to house the maximum district heating capacity.

Oilon was brought into the project in the autumn of 2005. Aalborg Industries is the main contractor of the project and delivered the boilers to the district heating plant. Oilon, as a contractor to Aalborg, delivered four 32 MW Lenox Low-NOx KT-35 L burners.

“The partnership between Aalborg Industries and Oilon is developing well, and the use of Aalborg boilers with Oilon’s Low-NOx burners guarantees the best possible combination for the people of Oslo,” says Aki Jattu, Project Manager at Oilon.

The cramped quarters in the building were able to accommodate two Mission D type hot water boilers, and together they provide the maximum efficiency allowed by the premises. The 60 MW boilers correspond to 80 tons of steam capacity per hour.

Because the old transformer station is so near the Oslo city centre, the emission requirements were stringent. Light fuel oil was selected as the plant’s fuel. The emission requirements specified that NOx values had to remain below 190 mg/Nm³ and carbon monoxide values below 50 ppm. The limit for solid particles was set at 10 mg/Nm³ with the furnace load being 550 kW/m².

The limited space in the transformer station posed extra challenges for burner installation as well. The burners were situated on the roofs of the boilers, two burners for each boiler.

The Viken Fjernvarme district heating plant is located right next to the Oslo city centre.
The use of natural gas becoming more common in Southeast Asia

The adoption of new gas reserves has had a significant impact on the growth of natural gas consumption in Southeast Asia. Singapore and Malaysia, for example, started up their first natural gas boilers some three years ago. The natural gas burned in Singapore comes from Indonesia along two submarine gas pipes, while Malaysia is self-sufficient in terms of gas.

Another significant reason for the increased use of natural gas is a desire to decrease pollution. The government of Singapore, where the move to natural gas is largely government-driven, has for years demanded significant decreases in pollution by the country’s industry.

Over the past two years, several large corporations in Singapore, including Schering Plough, Nestle, Jebsen&Jessen, Mitsubishi Belting and West Pharmaceutical, have begun to use natural gas. In practice, this meant exchanging the existing oil burners for natural gas burners.

Oilon has been a successful participant in these alterations as a supplier of burners. Pacific Central Teknik, Oilon’s long-term partner in Singapore, has performed several gas alterations in Singapore and neighbouring Malaysia. Most of the customers switching over to gas burners have been new delivery sites for Oilon. At the moment, more than 70 factories in the area run on Oilon burners.

In conjunction with burner replacements, burner automation has been updated to use electronic ratio control. Thanks to improved control, the efficiency of the plant can be increased by up to a few per cent. Several customers have switched to Oilon’s WiseDrive electronic burner control system, including Nestle, Natural Ole Chemicals, Palm Oleo, Soon Soon Oil Mills and Johnson&Johnson.

“Our experiences with WiseDrive have been very positive. The users have been very happy with the energy savings, accurate control and ease of use,” says P.C. Pek of Pacific Central Teknik.

Burners for Finland’s largest fire tube boilers

The Finnish paper company UPM-Kymmene, one of the largest in the world, started an auxiliary steam boiler plant project last year. Vapor Finland was selected as the supplier. The three-pass boilers are the largest ever to be manufactured and used in Finland. The project decided to utilise Oilon’s expertise in steam boiler burners. Last year, six Oilon GP-2000 ME burners with a 4.5–22.5 MW capacity range were shipped to the city of Lappeenranta.

“Oilon’s delivery included burners, fans and the burners’ gas pipe system equipment. The plant uses natural gas, so the burners were natural gas burners with modulating controls. The burners’ control automation is fully logic-based and it was delivered by our partner OS Automation Oy”, says Kari Puro, Sales Manager at Oilon.

“In addition to our experience and expertise we can offer the best maintenance services. Our flexible customer service once again provided a competitive edge,” says Puro.

UPM needs steam to run its massive paper machines in Lappeenranta. The plant provides 102 MW of thermal heat and 156 tr/h of steam power. The operating pressure of the plant’s three Vapor TTK-1000-2 steam boilers is 10.5 bars and the temperature of the superheated steam is 200 °C.

UPM-Kymmene is a partner of respectable size. One of the world’s largest paper companies, its turnover last year totalled almost EUR 9.3 M. UPM has more than 31 000 employees. The company focuses on magazine papers, newsprint, fine and specialty papers, converted products and wood products.
Over the past few years, Oilon has gained a significant foothold in China. Currently Oilon is already one of the three largest burner suppliers as well as the fastest-growing burner supplier in all of China. Sales volumes are growing at a whopping 30 per cent annually.

We have achieved brand recognition in China through years of hard work. Oilon first came to China in the early 1990s. Since then, our Chinese partnership has continued successfully, and little by little, thanks to sales growth, seminars and customer visits as well as locally provided training, Oilon has become one of China’s best-known burner brands. The Chinese subsidiary, founded three years ago, now has more than 30 employees.

“Partnership with the Chinese has gone well. We have received positive feedback particularly regarding our customer-friendliness and quick service. Oilon is also considered a very reliable partner,” says Kari Palo, Oilon’s Business Manager.

More and more Chinese boiler manufacturers have included Oilon burners in their product range and also offer it as first choice to their own customers. Oilon’s Chinese customers include several boiler manufacturers, including Shuangliang Boiler Works, Hangzhou Tuff Boiler, Tianjin Baokang, Guangzhou Boiler Works, and many others. In Eastern China alone, up to 70 per cent of boiler manufacturers now use Oilon.

Progress in a big country

In order to grow in a huge country such as China, Oilon had to build a comprehensive sales and service network in the most important cities. The network has been built in cooperation with Oilon representatives and retailers. Some retailers, like Guangzhou Liancheng Energy Technology Development, Jinan Ouli Technical Development and Wuxi Bangde Trade Co, currently have several sales offices and service points in China. All in all, Oilon burners are sold in over 20 sales offices all over China.

Service training is also important in China. Thus Oilon trains dozens of customers either at the Oilon training facilities in Wuxi or, if necessary, at the customer site. Last year Oilon trained more than two hundred people in China.

If Oilon has become a familiar sight in China, so have the Chinese customers visiting Oilon’s hometown Lahti. The Chinese boiler manufacturers feel that seeing the
Oilon’s partnership with the
Chinese company Great
Wall Aluminium Co. Ltd. be-
gan with a challenging project some
six years ago. In 2000, a plant pro-
ducing aluminium-based upgrad-
ed products had a big problem with
the burners of its molten salt heaters.
The burners being used at that time
continually overheated the pipes in
the boiler’s upper portion, damaging
them, which in turn seriously disrupt-
ed production.

Oilon accepted the challenge,
studied the customer’s problem at
a detailed level and developed a tai-
lored solution. After
long negotiations, the
solution gained the
customer’s accept-
ance and trust. The
solution depends on
phasing combustion
air using the burner’s
tertiary register, from
which the air is piped
between the flame and
the boiler pipes. This
layer of air protects the
upper boiler pipes from
overheating. The solu-
tion was a success and
was the start of a partnership that
has endured for years.

The tapping factor of the tailored
burner is 1:25. Power regulation and
switching from heating output to nor-
mal driving output is automated so
that all actions can be controlled and
monitored from the plant’s control
room. As an added benefit, the boil-
ers’ start-up period was shortened by
six hours which brings the customer
significant economical benefits.

“Since then we have had very
close partnership and customer rela-
tions with Great Wall Aluminium, and
this still continues. Oilon has already
delivered 34 burner units to the plant,
for the combined combustion pow-
er of 525 MW,” says Martti Salonen,
Project Manager.

Great Wall Aluminium, located in
Zhengzhou, a city of seven million in-
habitants in China’s Henan province,
is as gigantic as its name implies. The
plant is the largest of its kind in China
and has almost 15 000 employees,
which is more than that population of
a typical small town in Finland. The
plant, founded in 1958, is now a part
of China Aluminium Corporation.

Each year the factory manufac-
tures over 1,3 million tons of alumi-
nium oxide, 58 000 tons of aluminium
ingots and over 120 000 tons of oth-
er processed aluminium products.

After various upgrading processes,
the products end up being used in,
e.g., the automotive, glass, ceramics
and pharmaceutical industries.

Some of Oilon’s burners have
been delivered to the calcination fur-
naces at the factory that have ex-
tremely corrosive, dusty and diffi-
cult conditions. Yet the burners have
functioned splendidly and feedback
from the Chinese has been very pos-
tive.

“They have been very happy. The
Chinese also consider Oilon’s annu-
al checkups important. “The partner-
ship is also valuable for Oilon and
has certainly affected Oilon’s suc-
cess elsewhere in China, as well,”
says Salonen.
In December 2004, after five years of negotiations, Oilon closed a deal with a new partner: Thermax Ltd. This contract means that the boilers produced by this world-renowned Indian listed company will start using Finnish burners by Oilon. The partnership enables Thermax to offer its Indian and foreign customers Oilon’s world-class burners to go with its world-class boilers.

Oilon values Thermax’s energy expertise greatly. The partnership, already underway, is expected to be enduring and rewarding.

“The partnership has started with two enthusiastic parties and big investments. The future looks good,” says Jukka Jaatinen, Oilon’s Regional Export Manager.

For Oilon, the partnership means also investing in product development and organising training in using and servicing burners. Numerous Thermax employees have been trained in Finland and in India. The partners have also organised joint seminars for their customers in many different cities in India. The seminars have attracted hundreds of participants.

Thermax has ten regional offices in India and all of them have wide retail networks. Internationally, Thermax has companies and representatives in India’s neighbouring countries as well as in Brazil, Dubai, the Philippines, China, Indonesia, Kenya, Malaysia, Nigeria, Saudi-Arabia, Thailand, Russia and the United States. They also have offices in Belgium and the United Kingdom for European functions.

“Partnership with a huge company like Thermax helps Oilon grow further and brings us global visibility. After the Thermax contract, several other big names in the energy business have expressed interest in Oilon. Oilon, for its part, can offer the specialised and tailored burner models and solutions that large companies like Thermax require,” says Jaatinen.

Thermax utilises almost the entire range of Oilon burners. The contract gives Thermax exclusive sales rights to Oilon burners to Indian boiler plants. Thermax has also been satisfied with the new partnership.

“Oilon’s competitive advantages for us were high quality and wide range of burners in particular. In a market characterised by changeable oil quality and increasing use of natural gas, Oilon offers good support for Thermax,” says Shishir Joshipura, Head of the Process Heat Division at Thermax.

“Oilon is especially indebted to Mr V. Radh Krishnan for his personal contribution to closing the contract, and to Mr Ajay Darji, the project manager for Oilon products at Thermax in Pune, India,” says Jaatinen.
Over the last few years, Oilon’s Russian sales have increased annually at a rate of 20% through the country’s plant renovation projects. With increasing sales, Oilon has devoted particular effort to building a comprehensive service network. The St Petersburg office has a new Service Manager, and in 2006, new spare parts warehouses were set up in St Petersburg, Moscow and Ekaterinburg.

“Oilon trains carefully selected Russian installation companies whose technicians receive frequent service training in Finland,” says Martti Kauhanen, Oilon’s Export Manager for CIS Countries.

Last year’s delivery of four GKP-600 M burners to Yakutia in the distant Sakha Republic provides a good example of Oilon’s east trade. Sakha Republic is an autonomous republic located, from the Finnish perspective, in a remote corner of Siberia.

The oilfield plant in the village of Kangalassy used to use coal as fuel, but with the renovation project started by the country’s president Vyacheslav Shtriyov the decision was made to modernise the plant to burn gas. After the renovation, the local boiler plant became the country’s largest boiler plant of this type.

The boiler plant provides heat for the industrial village, which has a 250-bed hospital, school, kindergarten, production and industrial facilities and residential buildings. The village is an extremely demanding environment: in the heating season, outside temperatures may fall to -60 °C.

The burner was commissioned by Technologia Severa, whose employees have attended Oilon’s burner training. Experts from the Russian Federation’s testing inspectorate monitored the installation, and thus the work, safety automation and Oilon burners all comply with Russian standards and regulations.

“We’ve received positive feedback from Kangalassy, both from the plant and the villagers. The new boiler plant greatly improved uninterrupted heat distribution and the availability of warm water,” says Kauhanen.

Burners for a St Petersburg water park

A modern business and leisure centre called Grand Canyon is currently being constructed at a former factory site in St Petersburg. The new building plans require expansions to the site’s existing, elderly heating plant. Three GKP-300 M gas/light fuel oil burners were ordered from Oilon for the plant. Oilon’s long-term partner Energostroi is responsible for the heating plant expansion and its automation.

The huge construction project is still underway. Once completed, the water park and business facilities of the centre will form one of Russia’s largest business and leisure centres.

“The customer also wanted modern technology for the heating plant. So Energostroi, which was responsible for automation, implemented full remote control via network. The control room does not require any staff - if there is an alarm, the heating plant status can be checked over the Internet,” explains Kauhanen.
The marine industry has recently become a fast-growing market for Oilon. Burners from the Finnish company now sail all over the world in luxury cruisers, containerships and tankers.

“Burner sales to the marine industry are hot just now. Marine burners are delivered all over the world almost every day. We are currently one of the most important suppliers of pressure jet burners for the marine industry,” explains Jari Kurikka, Oilon’s busy Sales Engineer.

Oilon has extensive experience in manufacturing marine burners. The first Oilon burners sailed away over 40 years ago and some of them are still in use. But marine burner production really took off only a few years ago when Oilon found new partners in the marine industry. Fruitful partnerships have been formed with companies all over the world, such as Aalborg Industries and Kangrim, who have selected Oilon as one of their burner supplier.

The Finnish shipbuilding industry has a long, glorious history, and Oilon has been a strong supporter of domestic marine expertise. In addition to its long experience with marine burners, Oilon has been able to provide other benefits to its customers.

“Customers have given us a lot of positive feedback about our flexibility and our ability to meet special requests. Competitive prices have also helped things along,” smiles Kurikka.

**Oilon meets customer needs**

During the last few years we have delivered a great variety of burners to meet different customer needs. Some customers have been satisfied with a plain burner unit, whereas others have required wider deliveries including burners, control panels, oil pumping units and starters.

Oilon has also been able to take advantage of its own speciality. Ship tanks collect liquid waste called sludge. Rather than throw it away, customers want to burn it to utilise the energy it contains. Sludge burners are usually fairly expensive, but Oilon has been able to offer its customers a very competitively-priced solution. Some of the burners delivered by Oilon have included special air atomizing sludge nozzle that enables burning of the sludge collected in the tank.

The power of pressure jet burners usually fall within the range of 1-5 MW. In addition to delivering the burners, Oilon also services them when needed. The serv-
Oilon has delivered burners for recovery boilers made by Andritz and Ahlström for ten years. Already more than two hundred burners delivered during 21st century is a good indication of a working partnership.

One good example of the partnership’s achievements is the delivery of burners to the UPM-Kymmene pulp mill in the town of Pietarsaari, Finland, which have been in use for two years.

“The burners have functioned well without any major problems. Our experiences in using them have been positive,” says Lauri Mattila, Supervisor of UPM-Kymmene’s Wisaforest power plant, in Pietarsaari.

Oilon’s customer service after delivery has also impressed the people in Pietarsaari.

“Contacts with Oilon have been great. Whenever we have had questions, we have got assistance,” Mattila continues.

A total of 17 burners have been delivered to Pietarsaari, including start up, load and odorous gas burners installed in a recovery boiler and an auxiliary odorous gas reserve burner installed on the roof of the boiler building.

The importance of continuous development

Oilon’s and Andritz’s partnership has been in great demand around the world in recent years. Besides Finland, deliveries have been made to Portugal, Slovakia, the United States, Chile and Russia.

The market is demanding and the continuous technical development of burners for recovery boilers is necessary and the importance of the burners has increased. Oilon’s product development is continuous and it is performed in cooperation with the customer, taking into account the new demands related to the development of process technology.

“Burners develop often between projects. The previous project is leveraged for possible new developments for the next project,” says Tero Laitinen, Project Manager at Oilon.

Burner deliveries to Botnia’s pulp mill in Uruguay have presented Oilon with new challenges. The plant will be built to be exceptionally environmentally friendly, which places stringent demands on burner usability also keeping the emissions low during sudden process changes. Much effort has been devoted to planning a system that will guarantee the flexible, uninterrupted use of odorous gas burners.

“Recovery boiler burners have to function in extremely demanding conditions. Oilon has potential to meet these requirements,” says Laitinen.

Andritz

Andritz Group is a large, traditional company originating in Austria but now operating in the global market all over the world. The company’s long history began with its establishment in the city of Graz in 1852. Today Andritz has more than 6000 employees and 30 production plants around the world. Andritz is a multi technology company best known as a versatile supplier of machinery for the wood-processing and steel industries. Andritz has successfully continued the recovery boiler business based on traditional Ahlström Corporation since year 2001.

iice network is growing continually and agents can be found all over the world. Still, a service order from the warm southern seas always comes as a pleasant surprise to technicians shivering in the cold Finnish winter.

“If the customer needs it, we’re always happy to take off for the Mediterranean or the Caribbean to do some service work,” chuckles Kurikka.
The popularity of ground source heat pumps is growing

More than 3000 ground source heat pumps are sold in Finland every year and the market is growing at a rate of 30% annually. Ground source heat pumps have been particularly popular in private houses. Now a ground source heat pump is installed to almost half of new houses over 180 m². The renovation market in particular offers further growth in future.

Geopro Systems Oy, based in Lahti, Finland is one of the most successful domestic manufacturers of ground source heat pumps. The company is a subsidiary of Oillon Group. Besides Finland, Geopro Systems sells ground source heat pumps abroad to such countries as Sweden, Germany and the Baltic States. The company’s products are designed on the principles of operational reliability and long-lasting functionality in the demanding Nordic conditions. Ground source heat pumps have a lifecycle of up to 20-30 years.

Beside energy cost savings, buyers of ground source heat pumps are looking for devices that are easy and effortless to use. Markus Auvinen, who installed a Geopro GS-90 model heat pump in his new house, agrees.

“Our purchase decision was based on how cost-effective and effortless this form of energy is. Moreover, the space needed for the Geopro ground source heat pump is so small that we have much more free space in the house than if we had selected another system. Another factor was, of course, the fact that the ground source heat pump is environmentally friendly,” says Auvinen.

The 195-meter deep well, where the energy is taken, was drilled in the Auvinens’ backyard in a day. When the garage is connected to the system, the house will have some 250 m² to be heated.

“We have been very satisfied with Geopro. We have conserved even more energy than we expected to, and the electricity bill reflects that. As promised, the devices have been easy to use and the heating can be adjusted,” says Auvinen.

Solutions for everyone

One of Geopro’s success factors is the company’s wide product range. It includes 5-50 kW ground source heat pumps for builders, renovators and heating system replacers, plus a ground source heat pump for industrial halls.

Besides small pumps, the Geopro GS range, designed for domestic heating, provides several technical speciality solutions. The modern Scroll compressor ensures silent running, and the customer can control the heat pump using a mobile phone. The popular Geopro SH superheating pump utilises a new active superheating technology that allows water temperature to be raised to 80 degrees.

“Sold and installed by professionals, the warranty and service of ground source heat pumps are easy. We train our retailers regularly and they ensure that the consumer is not left alone with any problems. Geopro ground source heat pumps are always dimensioned to meet the customer’s individual needs,” says Olli Andersson, Geopro Systems’s Business Manager.
Finns are becoming more and more interested in biodiesel. The general rise in energy prices has already turned many heads towards the future of biodiesel. Besides light fuel oil, modern oil burners can use domestic biodiesel as fuel. The challenge now is the small scale of domestic biodiesel production.

"Biodiesel is certainly in demand. I keep receiving enquiries about whether I have enough biodiesel for sale. So far I’ve used all of it myself, but in future I’m planning to increase biodiesel production enough to sell it," says Seppo Malinen, who has been manufacturing biodiesel at Lammi for a year.

Biodiesel can be manufactured from rapeseed, fish parings or the waste vegetable oil used in cooking. Finnish farmers have been enthusiastic about biodiesel, but also cautious. However, many farmers believe that attitudes will soon change.

"I believe that in the near future, biodiesel production will become very popular among farmers. The biggest reason for their caution has been the lack of state subsidies for biodiesel producers. Biodiesel currently has a high excise duty which detracts from its competitiveness compared with fossil light fuel oil. Eliminating the tax would hugely increase the number of biodiesel producers," says Kimmo Jokiranta, an Elimäki rape farmer, who produces rapeseed for biodiesel purposes, appealing to Finnish decision makers.

Malinen agrees with Jokiranta.

"The state’s agricultural and energy policies drift aimlessly with regard to this matter. It is clear that all of Finland would derive clear benefits from increased biodiesel production."

Switching to biodiesel is easy

Some 260 000 Finnish households are currently heated with oil. These households could easily switch over to biodiesel as it is a suitable fuel for the heating systems currently in use. Oilon has also remodelled its burners to allow for easy adoption of biodiesel. The alteration only requires replacing the nozzle and combustion head of small burners and re-tuning them. The cost of the parts is no more than some ten euros or so.

Over the last few years, the technology and quality of domestic biodiesel production has improved. The quality of domestic transesterified rapeseed is excellent and it is not sensitive to price fluctuations. Transesterified rapeseed is called RME, rapeseed methyl ester, and has an international standard: EN14214.

"Besides being a renewable natural resource, biodiesel’s good combustion values illustrate its utility as an energy source. When using biodiesel, emission levels are as low as when using light fuel oil, and biodiesel heating creates no fine particle emissions at all. Biodiesel even mixes with heating oil, making it possible to use either fuel on the same equipment," says Pasi Aaltosen, Business Manager for Oilon’s Domestic Burners unit.

Oilon is currently participating in an experimental project with Lahti Science and Business Park aimed at increasing farmers’ motivation to produce biodiesel. Some farmers from Päijät-Häme will be included in the project, which is aimed at the implementation of viable biodiesel production and building a functional distribution chain to the consumers.

“It shouldn’t be hard to build a functional transport chain from biodiesel producers to domestic heating consumers: the demand already exists, and farmers already have the required equipment. All we need now is courage and a favourable attitude by the state,” say Malinen and Jokiranta.

Finland has almost 500 000 hectares of unused fields that could be utilised for the production of, for example, biodiesel.
Recently Oilon took a step forward in computational fluid dynamics as it hired Reima Mäkiranta, an old hand in fluid dynamics calculations, and acquired the modern equipment needed for the job. In future, computing the fluid dynamics of combustion will bring significant benefits to Oilon’s product development and customers.

One of Oilon’s strengths has always been first-rate practical know-how regarding the combustion process. With the assurance born of long experience, all burners have been adjusted to fit the customer’s furnace. But the market is getting tougher, and more and more often we are required to ensure and prove beforehand that the burner and furnace will work - sometimes even without a suitable reference case.

Oilon aims to develop more environmentally friendly burners which subject the burners’ NOx emissions to closer scrutiny. New burners are always undergoing product development. Improvements are also designed for current models. Using nothing but laboratory and field tests to discover the best structures and settings too often requires expensive, time-consuming test series.

A good tool for these tasks is CFD (Computational Fluid Dynamics), which means computerised numerical flow simulation and combustion modelling.

“This method allows us to reliably predict pressure loss in the flow channel, for example, or temperature distribution in the furnace or emission levels. Analysis of the calculations can then confirm the trouble-free operation of the burners, allowing us to select the best solution from a range of options,” says Reima Mäkiranta, Product Development Engineer and Oilon’s new expert in computational fluid dynamics.

Oilon has been gathering experience in computational fluid dynamics as a method for a long time. For over ten years, Oilon has collaborated with various universities and engineering offices in computational fluid dynamics to improve its burners. Reima Mäkiranta also ended up at Oilon after a long career at Tampere University of Technology.

“This was a bold but necessary investment for Oilon. Investments in computational fluid dynamics are certain to pay themselves back. Computational fluid dynamics is a crucial part of product development at Oilon, and will speed up the burner development cycle,” says Mäkiranta.

Oilon’s customers and partners will also benefit. CFD allows burners to be adjusted well even before they are installed.
WiseDrive, the new electronic burner control system, has become a more and more sought-after product among Oilon’s customers. And no wonder, because WiseDrive and its associated residual oxygen (O\textsubscript{2}) control increases the burners’ efficiency, reduces emissions and lowers operating costs.

“Right now WiseDrive is especially popular in Southeast Asia, where the system has received lots of praise. I believe that the rest of the world will soon take a sharp upward turn,” says Jari Tuohimäki, Product Development Engineer at Oilon.

Developed as a standard burner product, WiseDrive is currently available for burners in the power range of 1-20 MW. Instead of the traditional single actuator, the WiseDrive system has up to four separate actuators for burner. The actuators are connected to the burner controller via a bus, allowing extremely accurate control: ±0,1°.

“The combustion air fan control can use a frequency converter, thus reducing electricity consumption at partial power. Burner noise levels also drop significantly at partial power,” says Tuohimäki.

The WiseDrive system also includes residual oxygen control, allowing full utilisation of the burner’s efficiency regardless of the season. The burner control system takes care of burner safety functions, mix control, load control, gas valve proving, frequency converter control and residual oxygen control.

Electronic control systems increase accuracy and savings in burning

A computer and a graphical touch screen panel can be plugged into the WiseDrive system, allowing users easy access to control the burner and read the error codes. It also makes burners easier to commission, service and monitor. The touch screen panel even creates a continuous trend curve of the burner’s operation and contains the event logger with timestamp.

“WiseDrive is easy to learn and use, even if you are used to the conventional control systems. If needed, Oilon provides training in operating WiseDrive for installation companies and end users in connection with deliveries,” says Tuohimäki.

As an accessory to WiseDrive, Oilon has also developed a system allowing customers to receive alarms from the burner as SMS messages on their mobile phones.

Part of Oilon’s design process

Computational fluid dynamics has also been adopted into Oilon’s design process. By combining CAD (Computer Aided Design) and CFD software we can simulate cold flows, such as flow channels and air distribution conduits, during product dimensioning and planning. For example, we can easily accommodate the customer’s space utilisation requirements and a trained designer can immediately check the pressure loss caused by the channel.

The threshold for modelling different cases is continuously dropping and the possibility for simulating several structural variations has increased significantly. On the other hand, the fine-tuning of burners is still based on solid understanding of the product and the official emission values come from measurements.

“In order to achieve the best possible results, we combine computer simulations with measurements and Oilon’s decades of experience in designing burners,” Mäkiranta says.
At the end of this year, Oilon will deliver two RT-25 K burners for Ekokem which is investing in municipal waste incineration. Ekokem, which has been successfully incinerating waste in Riihimäki, Finland for decades, has relied on Oilon’s burner expertise for years.

The new European directives place more stringent demands on waste incineration. This has influenced Ekokem’s decision to invest not only in hazardous waste but also in municipal waste. The new combustion line will be supplied by the German company Fisia Babcock Environment GmbH. At the heart of the delivery is the grate boiler, and Fisia has selected Oilon as the overall supplier of burners for it.

“Oilon’s strengths in this area are long experience with deliveries for waste incineration plants combined with the reliability of the burners and the accuracy of deliveries”, says Tapio Murtonen, Business Manager of Power Plant and Process Burners.

Compared with competing products, Oilon offered other benefits as well. Thanks to the advanced nozzle and atomizing technology, the burner only requires one lance and nozzle which are used for spraying all three fuels in use: light and heavy fuel oil and waste oil containing solid fine particles. “The peripheral devices included in the delivery also provide significant savings, because only one valve unit is required per burner, making the automation also much smaller in size. The automation system to be delivered includes burner control, their capacity controls and controls for combustion and cooling air fans,” says Murtonen.

“Nanotechnology multiplies the operative life of the nozzles. Typical applications include hazardous waste incineration plants, chemical processes and combustion of corrosive or erosive fuels,” says Tapio Murtonen, listing the benefits of nanotechnology.

The benefits afforded by the Nosco coating are successfully utilised at Ekokem’s hazardous waste incineration plants. Ekokem has successfully incinerated waste at Riihimäki, Finland for years.

MUNICIPAL WASTE INCINERATION PROFITS FROM OILON’S EXPERIENCE

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Demanding conditions in waste incineration

Oilon’s expertise in waste incineration plants is utilised around the world, from Europe to Asia. The burners being delivered to Riihimäki also benefit from Oilon’s previous experiences of the demanding conditions that apply in waste incineration. “The cooling and cleanliness of the structures and parts has received special attention in order to ensure that the burners are always ready for start-up and reliable operation,” says Murtonen.

The burners will be installed above the grate and will function as both start-up and auxiliary burners. During boiler start-up the burners heat the furnace and the grate to a temperature of 850 °C, at which point solid fuel can be fed onto the grate and the start-up burners shut down. If the temperature in the furnace drops below the temperature in question, the burners start up again. This ensures clean combustion and that the plant’s operations comply with emission requirements, meaning that the incineration process creates no environmental hazards under any circumstances.
Increased burner sales also places new demands on service training. To ensure a comprehensive service network Oilon has invested heavily in increasing and improving service training. During 2005, more than 600 trainees attended Oilon’s service training.

“We mostly train installation and service companies, but with the largest burners we also provide service training for the end users,” says Leif Ekholm, Oilon’s Manager of Customer Services.

Service training courses are mostly organised at Oilon premises in Lahti which provides a good setting for courses in both theory and practice. However training has been conducted in Oilon China for almost four years now and the training premises there will be re-organized with a 2.0 MW boiler for training purpose only. The average training courses lasts for two days and can be tailored according to the customer’s requirements. Oilon provides actual training courses on three levels depending on the skills of the attendees.

“The Basic Course is for beginners and mostly involves controlling, starting up and servicing Oilon’s smallest burner, Junior. The Level Two Course is for installation staff and the Level Three Course introduces the large industrial burners,” says Ekholm about Oilon’s course selection.

These days half of the participants come from abroad. They board in Lahti, and besides of training they can see some sights of Finland and life in Lahti.

“Our trainees have given very good feedback on the teaching and content of the courses. Our courses are one-third practical exercises, the rest is mostly theory. Besides traditional service training courses, Oilon provides troubleshooting courses that provide instruction on preventing and solving possible problems.

“The troubleshooting courses have emphasised practical exercises. They give us a good impression of how the trainees cope in problem situations,” says Ekholm.
**Junior Burners**
Capacity range: 12 - 82 kW
Applications: heating one-family houses

**Burners 130 - 150, 250, 280**
Capacity range: 390 - 3,500 kW
Applications: district heating plants, hospitals, greenhouses, large apartment buildings, the textile industry, and other process industry applications using steam.

**Burners 2-26, 50 - 90**
Capacity range: 42 - 1,500 kW
Applications: semi-detached houses and apartment buildings, hotels, crop dryers, paint workshops, bakeries, gardens, etc.

**Burners 300 - 700**
Capacity range: 770 - 9,700 kW
Applications: district heating plants, hospitals, large apartment buildings, and industry using steam.

**Burners 800 ME - 2000 ME**
Capacity range: 1,900 - 22,500 kW
Applications: district heating plants and process industry applications using steam.

**Power Plant and Process Burners**
Capacity range: 2,000 - 63,000 kW
Applications: Power plants, the process industry, and waste incineration plants.