



Axial flow fan hub undergoing balancing in the Howden Hua facility in Weihai, China

**Howden is an international applications engineer with a world-leading position in the design, supply and servicing of air and gas handling equipment.**

Its use of sub-contractors has risen over the past three years and Howden increasingly only manufactures components that are performance critical. Howden also uses its manufacturing processes to protect its technology and maintain its markets.

Howden's core products include centrifugal and axial fans, air and gas rotary preheaters and compressors. Howden also manufactures and supplies turbo-blowers.

Howden's core market is the power generation industry, where fans and heaters are integral parts of the coal-fired boiler and emission control systems including the processes for flue gas desulphurisation and denitrification. Howden also supplies a wide range of other industries including oil and gas, petrochemical, iron and steel, mining, smelting of aluminium and other metals, cement, nuclear, pulp and paper, transport and ventilation fans for tunnels. Howden derives approximately one-quarter of its revenues through aftermarket sales which benefit from its extensive installed product base.

Howden supplies products that are manufactured or assembled at its factories and other sites across the globe. Howden's principal operations are located in Europe, China and North America.

## ► Mission statement

Howden will continue to be the global market leader in air and gas handling and related products providing application engineering and lifetime customer service in markets where quality and reliability are paramount.



Howden engineers attend a Variax® axial flow boiler draught fan on a coal fired power station

## 2006 highlights

	2006 £m	2005 £m	Increase %
Revenue	<b>429.5</b>	345.1	<b>24.5</b>
Order book	<b>361</b>	304	<b>18.8</b>
Operating profit <sup>1</sup>	<b>49.3</b>	33.5	<b>47.2</b>
Share of profits of associates (post tax)	<b>1.5</b>	1.1	
Capital expenditure	<b>4.4</b>	3.6	
Depreciation	<b>(2.8)</b>	(2.6)	
Operating margin <sup>1</sup>	<b>11.5%</b>	9.7%	
Employees	<b>3,015</b>	2,804	

<sup>1</sup> excluding profit on the sale of property of £4.8 million in 2006

- Turnover increased by 24.5 per cent to £429.5 million; this was principally due to increases in volumes.
- Howden increased operating profit to £49.3 million (2005: £33.5 million) and its operating margin improved from 9.7 per cent in 2005 to 11.5 per cent in 2006, before taking into account profit on the sale of property of £4.8 million.
- Howden's order book grew to £361 million (2005: £304 million), an increase of 18.8 per cent, of which China accounted for £98 million (2005: £131 million).
- In China:
  - Howden increased sales to China to £148.9 million (2005: £97.1 million);
  - Additional product ranges were successfully introduced to the Chinese market during the year; and
  - Significant progress was made on the compressor manufacturing facility due to open in the first half of 2007.
- Howden achieved aftermarket sales of £110.2 million (2005: £122.0 million), whilst increasing both margin and profit.
- As part of the strategy to increase its presence in the petrochemical and oil and gas industries, Howden acquired the outstanding 51 per cent of Howden Compressors which consequently became a wholly-owned subsidiary.
- Howden has positioned itself to benefit from the large potential oil and gas, petrochemical and mining markets in India and Russia through the establishment of sales offices in these regions.

### ► Sinter waste gas fans

Iron ore sintering provides one of the more arduous applications for a centrifugal fan. This process is used in steel-making to agglomerate particles of iron ore into larger lumps which are suitable for use in a blast furnace. The Howden waste gas fan draws hot dust-laden air through the sinter bed and a key factor in successful plant operation is to maximise the life of the fan.

Howden's success in this application is due in part to its replaceable blade liner design. Once erosion occurs on a Howden fan, the client can replace the liner, and very quickly get the fan back in service. This eliminates the need to weld a hard-facing directly onto the blade surface, which can distort the blade and significantly increase power consumption on a fan which can be rated in excess of 6,000kW.

Howden's deep understanding of the mechanical, aerodynamic, and acoustic behaviour of the rotor contributes to its leadership in this field. With analysis methods to determine stresses in the rotor, to predict the dynamics of the support system and to model the flow through the impeller, Howden sinter waste gas fans provide a cost-effective solution to the plant operator's needs.



Working in collaboration with Siemens, which supplies the variable speed drives for the fans, Howden has established a leading market position in China, currently the largest market in the world for steel plants.

### Overview of performance

Howden achieved another set of excellent results in 2006 with sales of £429.5 million (2005: £345.1 million), an increase of 24.5 per cent, and operating profit for the period, before taking into account a profit of £4.8 million on the sale of property, of £49.3 million (2005: £33.5 million), an increase of 47.2 per cent. Net operating margin (before property profit) increased substantially to 11.5 per cent (2005: 9.7 per cent).

The sales increase reflected higher volumes for new equipment and stable selling prices, partially offset by lower aftermarket sales. Of the 24.5 per cent increase in sales, the net impact of foreign currency movements was negligible.

The closing order book grew to £361 million (2005: £304 million), with the increase occurring in the first half of the year. Although China still represents the largest and most important market to the Howden business, its relative importance reduced during the year such that, as at 31 December 2006, the Chinese market accounted for 27 per cent of the order book, compared with 43 per cent at 31 December 2005, with the proportion of the order book accounted for by customers in Europe and North America increasing.

The substantial increase in operating profit achieved by Howden in 2006 reflects the continued strong underlying demand for Howden products, in particular, from the electricity supply industry and the oil and gas sectors. Howden continued to benefit from ongoing operational benefits due to higher volumes and greater factory efficiency as well as other benefits from the restructuring programmes completed in recent years. The increased use of sub-contractors also contributed to improved operating margins.

Howden recorded slightly lower aftermarket sales of £110.2 million (2005: £122.0 million), due to low margin service work being eliminated in Europe, a number of projects being completed in Australia and the depreciation of the South African currency. Despite this, profit and margin both increased as the business refocused on higher margin work.

### Industries and segmentation

As at the end of 2006, the total market for Howden products was estimated at £1.7 billion, of which the power, petrochemical and oil and gas industries are the largest components. Other users of Howden products include the mining and iron and steel industries.

The products supplied by Howden to its principal global end-user market segments include:

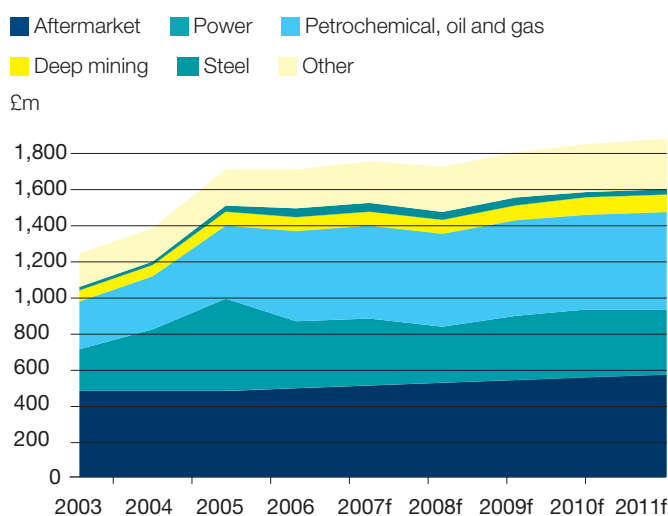
- power generation – fans and rotary heat exchangers for boilers, flue gas desulphurisation ('FGD') plant and denitrification processes; cooling fans for dry cooling systems;
- petrochemical plant and oil and gas – fans and compressors for refineries, ethanol and methanol production, and other processes. Compressors and specialised fans for offshore platforms; cooling fans for gas pipelines and underground storage compression stations;
- iron and steel – heavy duty fans for iron ore beneficiation plant (sintering and pelletising), and for basic oxygen and electric arc furnace steelmaking;
- mining – high integrity fans for coal, gold and other underground mining; and
- industrial processes – fans and compressors for a wide range of industrial processes including pulp and paper, cement manufacture, smelting and sulphuric acid.

### Industry overview

#### Demand

Demand for new Howden equipment is strongly influenced by the construction of new coal fired power stations, environmental legislation (in particular as it relates to emissions from coal fired power stations and other heavy industrial plant), the production of petrochemicals and oil and gas, the consumption of steel and demand for deep mined commodities such as gold and diamonds. As with many capital goods industries, the aftermarket represents an important part of the total market.

## Potential market for Howden



Source: Howden estimates

The total market for Howden products in 2006 is estimated as £1,700 million. The growth seen from the turn of the century up to 2006, driven by the construction of new power generating capacity in China, is expected to be followed by a period of consolidation, during which a gentle decline in the power market will be matched by growth in sales to the petrochemical, oil and gas industries. The aftermarket is expected to show further steady growth.

Since the turn of the century, there has been a spike in construction of coal-fired plants in China, which is now seen to be easing back towards the rate of growth of the Chinese economy as a whole. However, in other emerging economies, such as Central and Eastern Europe, and in more mature economies, such as Western Europe and North America, there is increasing new build, accompanied by the refurbishment and upgrading of existing plant and the return of mothballed plant to service. With the continued high price of natural gas and concerns over its future supply, as well as the ongoing public debate over nuclear power, coal is increasingly seen as an attractive primary energy source.

Governmental regulations stimulate demand for a number of Howden products, particularly in the environmental protection sector, where Howden supplies equipment for use in processes which reduce atmospheric pollution generated by industrial plant.

The existing governmental programme to reduce the quantity of sulphur dioxide being emitted from power stations in China is expected to continue. The USA and, to a lesser extent, Europe will continue to develop as a market for this technology.

Increased demand for Howden products is expected from the petrochemical and oil and gas industries. The oil price, whilst below the levels seen in most of 2006, remains high by historic standards, supported by forecasts of increasing demand from China and other developing economies. This continues to stimulate upstream and downstream plant construction, particularly in the refining sector.

### Competitive environment

Howden has strong positions in the specialised markets that it supplies.

Howden has an estimated market share of some 50 per cent of the combined worldwide markets for heavy-duty fans and heat exchangers, and as such it is the clear world-leader in this field.

Howden is one of the five leading worldwide manufacturers of screw compressors for use in the petrochemical industry. Together these manufacturers are believed to represent around 85 per cent of the market.

Howden's share of the aftermarket varies between regions. The share is particularly high in some locations, such as Africa,

where Howden originally supplied a high proportion of the original equipment, and Australia, where recent new build activity has been low. The aftermarket in China is still in its infancy following the rapid new build programme in the last few years.

### Howden supply chain

#### Manufacturing locations

Howden has manufacturing facilities in each of its principal markets of Europe, China and North America. Equipment is generally produced in the same region as the customer is located, although Howden does export product between regions, particularly from its manufacturing facilities in Europe. Sales in regions outside Howden's principal markets, such as Asia (excluding China), South America and the Middle East are relatively small but growing, and are generally supplied from Howden facilities in Europe.

#### Human resources

A key component in Howden's supply chain is the quality and quantity of its engineers. During 2006, Howden increased the total number of engineers it employs by over 100. At the end of 2006, Howden employed just under 250 engineers in China, 30 more than last year.

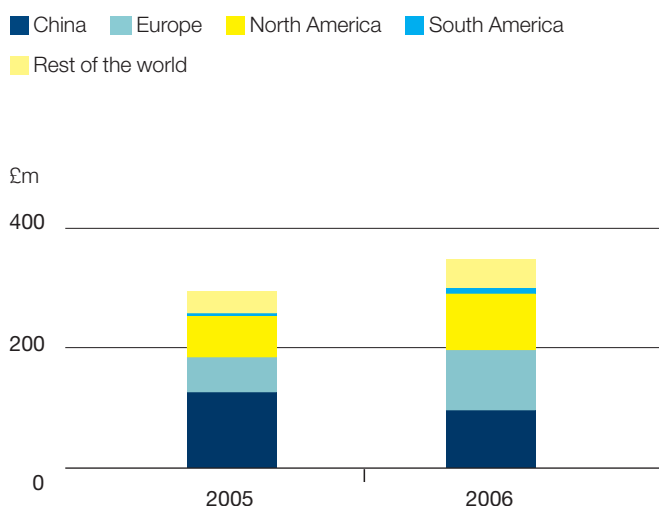
#### Raw materials

The principal raw material used in the manufacturing process is steel, the prices of which remained relatively stable during the year.

#### Sub-contractors

Howden has achieved growth in its production capacity through increased investment in new plant and increased use of sub-contractors, such that the number of man-hours subcontracted is estimated to have increased by around 50 per cent in 2006, whilst the number of man-hours in-house remained relatively constant. This has allowed Howden to meet peaks in demands without significantly extending its own cost base. Howden has primarily sub-contracted manufacturing to China, Thailand, Hungary and Poland.

### Howden: order book composition



Source: Howden estimates

During 2006, the order book grew to £361 million (2005: £304 million), an increase of 19 per cent. The absolute and relative dependency on China has reduced, and orders from customers in other parts of the world, especially Europe and North America, have increased. The winning of orders in Germany, Italy and Spain is an encouraging sign that Howden is being successful in accessing markets in which it has not traditionally been very active.

### Intellectual property

Technology and the Howden brand are key parts of Howden's supply chain. According to recent customer research, Howden has maintained its position of technology leadership in its principal product areas. The research also emphasised the strength of Howden's brand which is seen as representing engineering excellence, customer service, global reach, technology leadership and quality.

### Revenue and cost analysis

During 2006, Howden's sales were £429.5 million (2005: £345.1 million), an increase of 24.5 per cent.

The largest product area continued to be heavy-duty fans, followed by heat exchangers and compressors.

Aftermarket sales were £110.2 million (2005: £122.0 million), representing 25.7 per cent (2005: 35.4 per cent) of total sales.

Sales prices for new equipment were maintained during the year, with the improved operating margins being largely due to increased volumes resulting in improved factory loading and efficiency. In 2006, both the margin and the profit on aftermarket sales increased compared with 2005.

### Regional overview of performance

Howden's revenue by destination is summarised in the table overleaf. In 2006, Howden achieved significant growth in China, North America and South America.

### Regional markets

#### China

Sales in China amounted to £148.9 million (2005: £97.1 million), an increase of just over 50 per cent. This was primarily as a result of demand from the power supply industry for new generating capacity.

It is estimated that total generating capacity rose by slightly over 100GW during the year to 622GW. Of this increase, coal-fired capacity, where Howden has a strong market position, accounted for over 90GW, emphasising the continued importance of coal in the generation of electricity. In relation to environmental control, including FGD, a large portion of the current retrofit programme has been completed, and the future market will be more focussed on FGD for new power plant.

In other sectors, Howden has won a number of orders for main ventilation fans for use in underground coal mining and in the expanding petrochemical industry. Howden has continued to supply highly sophisticated fans used in the production of sintered iron ore, from both its Chinese and British companies.

Howden is expanding its manufacturing capabilities for various highly engineered products associated with the oil and gas and petrochemical sectors. These will be fully operational in mid 2007.

### ► Air preheater upgrade

The air preheater on a fossil-fuel fired boiler captures waste heat from the exhaust gas and uses it to pre-heat the combustion air, increasing the plant efficiency and typically reducing fuel consumption and CO<sub>2</sub> emission by 10 per cent. Rotary heat exchangers, of which Howden is one of the world's major suppliers, are used for this purpose in well over 90 per cent of the world's utility power plants.

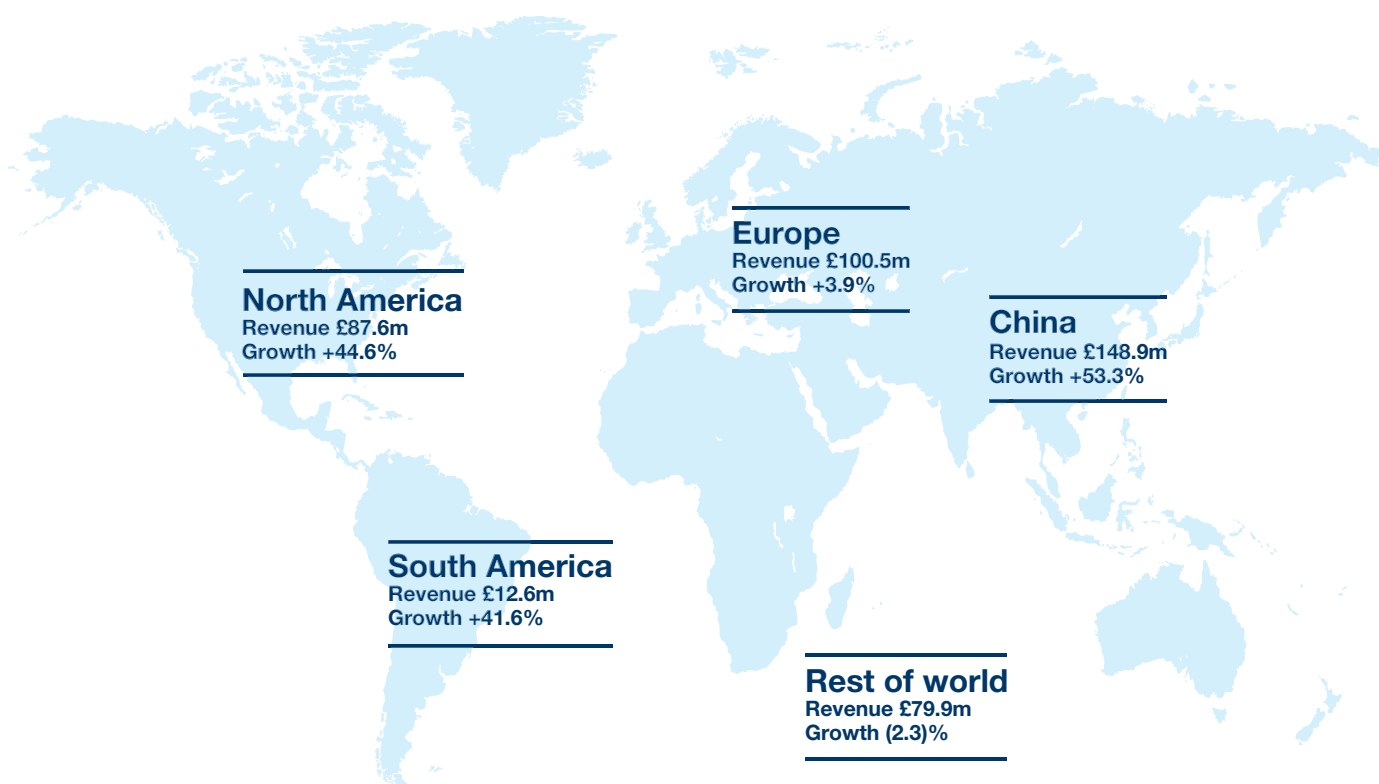
Many of the air preheaters in use today were installed over 25 years ago and since then their performance has declined and technology has advanced. Many have benefited from being upgraded to the latest Howden technology, for example fitting more efficient heat transfer surfaces and improving the sealing systems.

On a typical upgrade on a coal fired power station the boiler efficiency is increased, the auxiliary fan power is reduced and the cost of a retrofit flue gas desulphurisation plant is lowered significantly. Most recently Howden has carried out such modifications in Mexico, Saudi Arabia, Spain and China.



### Howden: revenue by destination

	2006 £m	2005 £m	Increase/ (decrease) %
China	<b>148.9</b>	97.1	<b>53.3</b>
Europe	<b>100.5</b>	96.7	<b>3.9</b>
North America	<b>87.6</b>	60.6	<b>44.6</b>
South America	<b>12.6</b>	8.9	<b>41.6</b>
Rest of world	<b>79.9</b>	81.8	<b>(2.3)</b>
<b>Total</b>	<b>429.5</b>	<b>345.1</b>	<b>24.5</b>



### *Europe*

Sales to customers in Europe increased by 3.9 per cent to £100.5 million. Reported growth was reduced as, during the period, Howden exited from low margin aftermarket work. Activity levels at Howden's facilities in Europe were high as product was exported, particularly to China and North America.

The European power market has been showing continuing signs of strengthening, with project activity evident throughout the region, but with an emphasis on Germany. Howden Ventilatoren, based in Germany, which supplies ventilation equipment for road, rail and wind tunnels in addition to serving the local power generation market, had an excellent year. Other industrial markets continue to be active and Howden, with its wide European presence, is well placed to participate.

### *North America*

Howden Buffalo Inc is headquartered in Camden, South Carolina and has four other main facilities, one of which is located in Mexico City. Sales to customers in North America increased to £87.6 million, with the power market particularly strong. Most other markets for new build also remained strong throughout the year, particularly cement, petrochemical and coal mining. The aftermarket was flat compared with 2005, due to the deferral of power station outages following the relatively mild winter. The growth in the order book during the period reflected the continued strength of the market for new build and pollution control in the power industry and across a number of other sectors.

### *South America*

Sales increased from £8.9 million in 2005 to £12.6 million in 2006 due to additional projects within the iron and steel industry and, in particular, Companhia Vale do Rio Doce in Brazil.

Howden's principal market in the region is Brazil, the world's biggest exporter of iron ore, which is significantly expanding its capacity to produce iron ore pellets used throughout the world as a blast furnace feedstock. Other opportunities are seen in the oil and gas and biofuels industries.

### *Rest of world*

#### *Africa*

In Howden Africa Holdings Limited ('HAHL'), in which Howden has a holding of some 55 per cent, sales declined by 6 per cent to £40.7 million in the year, as increased equipment and aftermarket sales to the power sector were more than offset by falls in the value of the South African Rand.

In May 2006, H AHL announced a proposed internal business and financial re-organisation of the companies within the H AHL group, including a cash payment to shareholders of ZAR 2.41 per share. This was paid in July 2006 and Howden's share amounted to ZAR 87.7 million (equivalent to £6.9 million).

In February 2007, H AHL reached an agreement to dispose of its 42 per cent holding in Pump Brands Pty Limited for an expected consideration of £2.4 million.

H AHL's future contribution to the Company's results is subject to further depreciation of the South African Rand and political and economic uncertainty in South Africa.

#### *Asia Pacific (excluding China)*

Howden's sales in Asia Pacific (excluding China) are predominantly to the mining, industrial and power supply industries in Australia, and have benefited from favourable commodity prices and buoyant conditions in the mining sector.

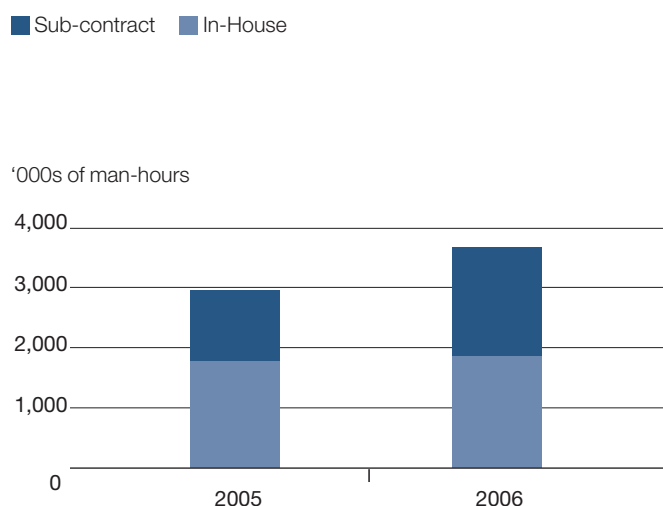
#### **Associated undertakings**

In 2006, Howden's share of the post tax profits of its associated undertakings amounted to £1.5 million (2005: £1.1 million).

Howden has, for some time, held a 49 per cent interest in Howden Compressors Limited, a Scottish based and incorporated company, which designs and manufactures high quality compressors for use in the refrigeration and oil and gas sectors worldwide. On 22 December 2006, Howden acquired from Carrier Corporation the remaining 51 per cent shareholding in Howden Compressors Limited, and its affiliated US sales company, at a cost of £12.9 million (including £2.5 million in respect of Carrier Corporation's share of the estimated cash in these companies at completion).

As noted above, agreement has recently been reached to dispose of H AHL's holding in Pump Brands Pty Limited.

## Growth of sub-contracting – man-hours ('000)



Source: Howden estimates

During 2006, the total of man-hours utilised by Howden increased from approximately 2.9 million to 3.6 million. Nearly all this increase was in the number of sub-contracted man-hours. Howden's use of sub-contractors, especially in the manufacture of non-critical components, has enabled it to meet the peaks in demand without investing in significant new capacity. It also enables better control of working capital and ultimately a lower price to customers. Howden continues to manufacture performance critical components, or where it is necessary to protect its technology or maintain its markets. Principal sub-contractors are located in China, Thailand, Hungary and Poland.

## Future developments and longer term growth prospects

### Market expansion

In China, Howden is taking steps to grow the range of products it supplies to the petrochemical, oil and gas, mining and other industries through the introduction of an increased range of locally manufactured Howden products. The rate of growth of electricity generating capacity in China is likely to slow from the exceptional levels seen in recent years, but it is still anticipated that appreciable new capacity will be added before the end of the decade.

Demand for new power plants in Europe and North America increased during 2006 and this trend is likely to continue in the future. The majority of the order book increase came from new equipment sales in these markets as demand for power increased and much of the existing plant, which was built during the boom period of the 1960s and 1970s, is reaching the end of its useful working life. In addition, ever more stringent environmental protection legislation requires that power generating companies invest in plant that has efficient atmospheric pollution systems.

In Russia, high prices for oil and gas are stimulating investment in the Russian petrochemicals sector. This is expected to be followed by growth in other sectors; for example in the power generation industry where significant increases in capital expenditure are forecast. Howden is strengthening its presence in Russia by establishing a sales office in Moscow that will coordinate activities throughout the region.

A local representative office is also in the process of being established in India where there are considered to be significant future sales opportunities, particularly from the anticipated growth in demand for power. The International Energy Agency has forecast that growth in demand in India over the next 25 years will be over 5 per cent per year, slightly ahead of the forecast growth for China.

South America continues to show potential for growth. Howden South America, based in Brazil, is currently growing its share of the industrial fan markets primarily in the steel, oil and gas, petrochemicals and biofuels sectors throughout the South American region and, in conjunction with other Howden companies, is expanding its product range to include compressors.

### Aftermarket

Howden is focusing on strengthening its aftermarket presence, particularly in the servicing of, and supply of spare parts for, its substantial installed base. As part of this strategy, it has withdrawn from certain low margin business.

Howden is well positioned to benefit from the large potential aftermarket in China, where it has now established a dedicated aftermarket presence. The new equipment installed over the past ten years is beginning to require servicing, spare parts and refurbishment.

### New products and applications

Howden is currently carrying out development work on the thermal performance, enamelling and on-line cleaning of rotary heat exchangers, and on variable pitch axial fans, all of which are applicable both to the new equipment and aftermarket sectors of the power generation and environmental control sectors.

During 2006 Howden supplied and successfully commissioned a submerged helium blower for the Pebble Bed Modular Reactor Project helium test facility in South Africa, which is another step forward in the development of this emerging nuclear technology.

Development of the Sirocco fan range has been completed. This is a new range of pre-engineered centrifugal fans suitable for use in many different industries. This project significantly reduces the time required to supply a fan, enabling Howden to offer shorter delivery times.

New processes emerging in response to carbon abatement programmes, such as hydrogen fuel cells and carbon capture and storage, will provide growth opportunities for a number of Howden products. A number of clean coal and carbon capture and storage projects are in various stages of engineering, which Howden will continue to support.

Howden's development of new products and applications will be weighted by value towards the power generation and petrochemical markets, where increasing plant capacity and efficiencies impose new demands on equipment suppliers.