

SwedenToday

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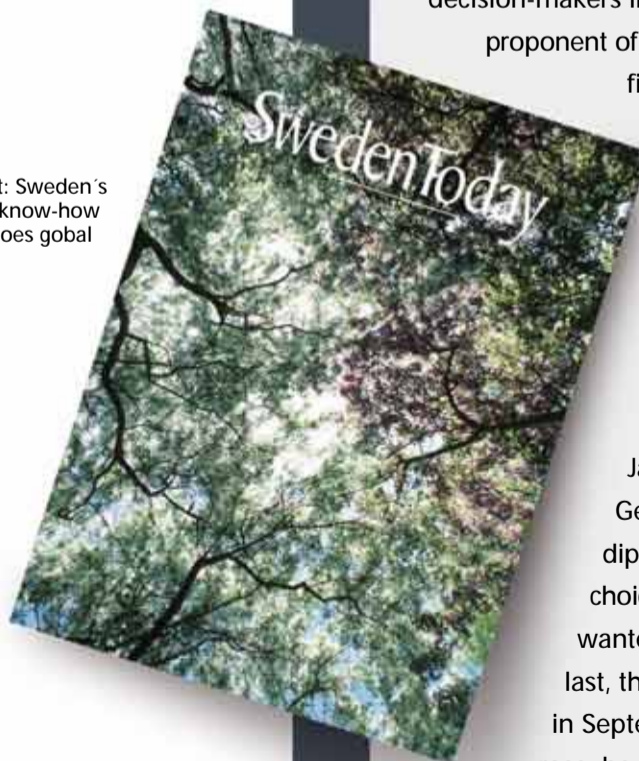
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Branching out: Sweden's green know-how goes global



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Climate change

So, we made it back to summer again. Back to those three months that people in Sweden spend the other nine months of the year looking forward to, when one's thoughts turn to trips to the beach, barbeques and basking in the sun – if there is time between World Cup games, that is. Sunshine is good for the soul after the winter we've had, but as an energy source it is also one of the potential solutions to this increasingly pesky problem we have with the Black Stuff. Never an issue far from the front of the mind, rising prices at the pump become perhaps most obvious at this time of year as road-trip season gets under way. There is a solution – a proven, sustainable and cost-effective one – at which Sweden is at the forefront: biogas. More and more Swedes are filling their cars with a fuel that starts life as a stomach-churning cocktail of slaughterhouse waste, sewage, household trash and hundreds of thousands of litres of illegally imported alcohol seized by Swedish Customs. Sales in Sweden of "green" cars – those that run on ethanol or biogas – were up last year by 168 per cent, and by the end of this year they are expected to account for about 20 per cent of new car sales. Göteborg has more of these cars on the road than any other city in the world, in percentage terms, and in the pages that follow we profile some of the Swedish companies involved in this growing and potential-filled sector. Spreading the use of this kind of technology is now a government aim, and Sweden's Minister for Sustainable Development tells us about the national vision of reducing the country's dependence on oil. Aside from the obvious benefits of breaking free from the upward spiral of oil prices and reducing harmful emissions, Mona Sahlin explains that such a move – the most radical of any government worldwide – will also create opportunities for Swedish businesses, whose know-how is already in big demand abroad.

On a mission

We speak to the CEO of state-owned energy giant Vattenfall who relates his personal mission to tackle climate change. This unlikely environmental activist has been touring the world, selling Vattenfall's proposals to bring global emissions under control to decision-makers in industry and government. A more credible

proponent of sustainability it would be hard to find. For the

first time, we have a special focus on Sweden's

shipping industry, which is cruising along very nicely, fueled in part by China's continuing expansion. We talk to, among others, Dan Sten Olsson, CEO of the huge Stena Group, about the state of the industry and its prospects. Sweden has a new – or not so new – face on the world stage in the form of the recently-named Foreign Minister Jan Eliasson. The former president of the UN General Assembly, who is a highly-respected diplomat with an impressive CV, was the obvious choice for the role, and indeed many Swedes have wanted him in the post for a long time. Now, at last, the job is his. But with the election coming up in September, and all observers predicting a close race, he should perhaps not get too comfortable.

Have a pleasant summer.

David Wiles

Editor

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The long view

BY ALAN HARKESS

Students of economics are confronted at an early stage of their labours to distinguish between short-term fluctuations of output, employment and productivity along a trend, and shifts in the trend of these variables over time.

• For a long time economic theory, particularly during the Keynesian era, emphasised the short and medium term, leaving discussions of the underlying determinants of long-term economic growth and the role of institutions for separate chapters that were somehow not quite central to the main structure of the analysis. Keynes had after all asserted that “in the long run we are all dead” and that it was perhaps advisable for economists to take a more pragmatic, less doctrinaire view of the workings of the economy. Operating over the short term, it became possible to construct fairly rudimentary models of the economy based on rather simplistic assumptions about the behaviour of consumers and investors. The influence of governments, paradigm shifts in technology and work organisation and structural sea changes in class, ethnicity and global communications were left to more “spurious” disciplines that did not share the positivistic tradition of what was then called “economic science”.

The landscape has changed and economics has in some sense returned to its old roots of “political economy”. There is no longer the same belief in tinkering with the operations of the economy in the short term. The focus is instead on better understanding the behaviour of the various actors in the economy, setting ground rules for their behaviour and thereby laying the foundations for policies that seek to steer the economy along its long-term growth path. Many students of economics still find it difficult to find what they consider to be the underlying structural components of the “big picture” and complain about the “short-termism” and a lack of a sense of history in modern economic writings. To quote a leading American economist, Paul Krugman, renowned for his hard-hitting, accessible style;

“There are three kinds of writing in economics. Firstly, Greek-letter writing – formal, theoretical, mathematical – is how professors communicate. Secondly, up-and-down economics that appears on the business pages and on TV and is concerned with the latest statistics, financial news etc. Finally there is airport economics, which is the language of economics best-sellers. . . . What is there for the intelligent reader who doesn't want to study for a Ph.D? Not a lot!!”

It is therefore a pleasant change from usual up-and-down routines to take a step back and examine the operation of the Swedish economy over a much longer perspective than usual – ten years rather than ten months. In 1995, the McKinsey Global Institute (MGI) conducted a study which aimed to understand Sweden's economic development. It found that the Swedish economy had underperformed in terms of economic growth, productivity and employment, compared to other OECD countries and had recently experienced a severe economic crisis. The study found that the rate of productivity growth in a number of industries was significantly lower in Sweden than in other comparable countries. This was principally attributable to a lack of competition due to “high product market barriers”. These barriers differed in kind: local authority restrictions that prevented new actors establishing retail outlets; import regulations that curtailed competition in food processing; restrictions on banking licences that allowed oligopoly conditions to prevail in Swedish retail banking. The weakness of Swedish competition legislation exacerbated the problem.

Now ten years on, against the background of strong productivity growth and sound public finances, the McKinsey organisation has decided to take another look at the Swedish economy. A number of key issues are examined. What have been the particular driving forces underlying the improvement of productivity? Why has Swedish employment growth underperformed? How can Sweden meet the challenge of job-outsourcing to low-cost economies? What areas of the Swedish economy should be given priority? These issues have been frequ-

ently touched on in these columns, but they have not been analysed in a long-term perspective that gives weight to structural rather than cyclical considerations.

Rapid productivity growth

As Martin Hjerpe, senior economist at the McKinsey organisation points out, the Swedish economic recovery since the early 1990s has been overwhelmingly based on rapid productivity growth. Between 1992 and 2004, Sweden achieved average annual productivity growth of 2.4 per cent compared with 1.9 per cent in the EU 15. The figures for the private sector are even more impressive. Over the same period, productivity improved by 3.3 per cent per annum in the Swedish private sector compared with an OECD average of 2.2 per cent per annum. As the study points out, only Korea, Poland and Ireland had higher productivity growth in the private sector over this period. The study also analyses productivity growth at the level of certain key sectors. For instance in the automotive sector, productivity growth was 8 per cent in Sweden compared with 2 per cent in Germany and around 5.5 per cent in Japan, France and the US.

The sectoral analysis of productivity growth reveals that a number of measures have helped to increase competition and improve the performance of product markets, including widespread deregulation, the strengthening of competition legislation and the removal of trade

Sweden's impressive productivity performance does not extend to the public sector

barriers and increased harmonisation that arose as a result of entry into the EU. The largest productivity gains have been recorded in sectors exposed to strong competition such as the automotive sector. It is interesting to note that the sector has achieved both an increase in the value added per vehicle and a reduction in the number of hours worked per unit of output. This improvement in productivity has raised profitability and laid the basis for an actual increase in employment! As Martin Hjerpe points out, the retail and banking sectors also provide examples of deregulation, strong productivity growth but these sectors have not been able to create net new employment. On

the other hand, sectors characterised by limited regulatory change and barriers to entry have experienced few productivity gains. Here the construction industry provides a good example. A protected, fragmented inefficient industry structure has generated low productivity growth and negative employment growth.

The McKinsey study confirms the findings of earlier studies which indicate that Sweden's impressive productivity performance does not extend to the public sector. Notwithstanding the difficulties in measuring productivity, there is strong evidence to indicate that the forces driving productivity gains are substantially weaker in the public sector. Substantial regulatory frameworks curtail competition and incentives that link performance and pay are weak. The probability that productivity is substantially lower in the public sector has a substantial impact at the macro level, since the public sector accounts for 30 per cent of total employment, which is double the EU 15 average.

Poor employment growth

Sweden's ability to create new jobs has been the worst among the countries studied in the McKinsey report. According to Martin Hjerpe, approximately half a million new jobs (about 12 per cent of total employment) would have been created in Sweden if the country had expanded employment at the same rate as in UK, France or Norway. This shortfall in employment opportunities was most evident in the private service sector. Between 1992 and 2003, the growth rate of private sector employment was only 4 per cent in Sweden, half the rate in, for example, Germany, and only one-third of the rate in another small welfare state, the Netherlands. An “average” performance in relation to service sector employment would have created an additional 250,000 jobs. The service sector is of strategic importance in this context since Sweden has in common with other developed countries experienced the same structural decline in manufacturing employment.

The inability to create new jobs has an inevitable impact on those seeking work. As we shall see below, cyclical factors may even increase unemployment despite an increase in vacancies. McKinsey estimates that in 2004 approximately 17 per cent of the labour force lacked full-time employment, including students who want to work but stay on at university since they cannot find a job, part-time employees who wish to increase their hours of work, as well as people on sick leave or on early retirement.

It is important to note, according to Hjerpe, that productivity growth should not be seen as being in conflict with employment. Over time, at the macro level, both jobs and productivity have increased markedly in Sweden. In the short term in certain industries, this conflict between productivity gains and employment may arise. But over time rising productivity

The Swedish automotive sector has seen considerable productivity growth

will increase the incentive for companies to invest in their employees.

Creating jobs

The McKinsey study focuses considerable attention on Sweden's limited ability to create jobs in the private service sector. It argues that an increase in service employment to British levels would raise service employment by approximately half a million. The study also points out that high levels of labour costs in labour intensive services act as a brake on employment. Sweden is the fourth most expensive country in the OECD for services. The use of labour is highly taxed which creates high tax wedges i.e. the Swedish wage earner has to work a proportionately long period of time to afford a restaurant meal or to pay for a car repair. An alternative way of addressing the same problem is that productivity levels would have to be disproportionately high or service levels disproportionately low to make the provision of the service profitable. The study bears out these arguments indicating that Sweden has the lowest share of private consumption on restaurants and hotels in Europe and the highest revenue per employee in retailing in Europe.

A second argument that helps to explain the lack of job creation in the service sector relates to the lack of flexibility in working arrangements at the micro level. The report points out that the marked difference in hourly overtime rates and the detailed compensation schemes in parts of the building industry lead to inflexibility, higher costs and lower employment levels. At the macro level, a lack of flexibility in the form of high levels of employment protection will tend to impede labour mobility, hinder structural transformation and entrepreneurship. The authors of the report suggest that the Danish "flexicurity" system that offers a trade off between lower levels of work protection and high levels of unemployment benefit and active unemployment support is worthy of attention. The system would appear to encourage higher levels of mobility which might be expected to lower costs and generate employment. Whether or not "flexicurity" actually lowers unemployment remains a matter of contention. The attitude of the Swedish unions towards the Danish system would appear to be unenthusiastic.

A three-pronged attack

Summarising their recommendations, Martin Hjerpe, points to the need to further increase competition in the private sector, raise productivity levels in the public sector and substantially increase private-sector service employment. Many of the productivity improvements over the study period were of a "one-off" character involving deregulation. Several sectors, notably construction, should, according to the study, be given priority. However, it may prove to be a harder task to generate further productivity improvements in sectors that have already undergone substantial deregulation.

The main doubt about the McKinsey study's recommendations, however, concerns the required improvement in service employment. Olle Holmgren, senior economist at SEB, suggests that raising employment participation rates over time is a slow, complex process. He suggests that even relatively successful economies such as the Danish and British have not been able to raise labour force participation substantially. A certain amount of temporary help may be offered by cyclical patterns which suggest that labour force participation normally increases when the prospect of employment increases. This would appear to be a description of the current labour market situation where increases in the labour force are maintaining present high levels of unemployment. Behavioural changes may also affect activity levels. Student levels may drop off after the "boom years" of the Adult Education Initiative while the older generation of workers may wish to continue in work longer as a result of changes in the pension system. Whether or not these effects will be substantial enough to significantly raise activity levels is somewhat uncertain.

Taking this long view of the changes that have occurred in the Swedish economy over the past ten-12 years reminds us of the genuine progress that has been made. Up-and-down economics may miss the big picture, but it is there to be seen.

Exclusive Nordic style spreads

Design House Stockholm is showing the world there is more to Swedish furniture and furnishings than Ikea. The company, which describes itself as being to designers what a publishing house is to authors, has reported growth of over 30 per cent and is continuing to expand abroad. Design House Stockholm peddles the best of Scandinavian design at 600 high-end stores throughout Europe, Japan and the US, including MoMa in New York and San Francisco, Conran's and Selfridges in London, Colette in Paris and Spazio Sette in Rome. It has just opened a new interior design boutique in Copenhagen, and Oslo is next on the list.

"There is scope for Swedish design to make money abroad," says marketing boss Hans Hjelmqvist. "The Danes have very good design of their own, but they recognise that we have a youthful, international concept."

Among the 30 or so of Scandinavia's most innovative designers sold by Design House Stockholm are Finnish Harri Koskinen, of the iconic Block Lamp, and Jonas Grundell, the originator of the folding candelabra. The company has its flagship store at Sweden's most exclusive department store, NK, plus 50 other boutiques across Scandinavia. The company, which was founded in 1992, turned over €14m last year. Design House Stockholm also works with design management and product development for other brands, and "design trading" generates as much turnover as its own brand. Here its customers include Crate&Barrel and MoMa in the US, and Habitat in the UK.



Desirable design

Wallenberg Sr still active at 80

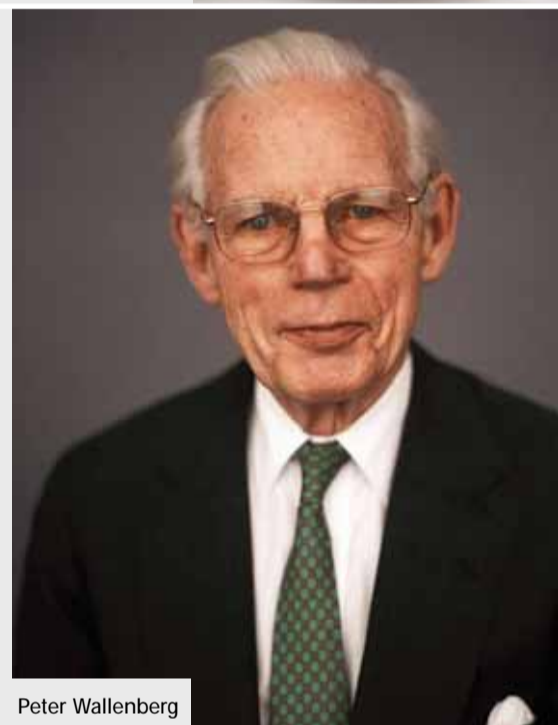
Peter Wallenberg may have just turned 80 and has long been retired, but the patriarch of one of the most influential and wealthy dynasties in Sweden maintains an active interest in the family business.

The Grand Old Man of Swedish industry and finance, besides being honorary chairman of investment company Investor AB, which the family controls, is also chairman of the Knut and Alice Wallenberg Foundation and honorary chairman of Atlas Copco AB.

Removing himself totally from the world of business was never going to be an option for the head of the family that controls a large chunk of the Swedish stock market. In an interview with the daily Dagens Industri, published on his 80th birthday, Wallenberg described himself as being something of a rebel in his younger days who went on to be a workaholic. "Exertion gives me satisfaction," he said.

Exertion was certainly something he got with the family business. From 1969 to 1997 he was director and then chairman of the sprawling industrial holding company Investor, in which the family is the major shareholder. Investor's portfolio includes major stakes in many of Sweden's biggest companies, including ABB, AstraZeneca, Scania and Ericsson.

Despite his success in business, Wallenberg claims he has never managed, nor aimed at, building up a large personal fortune on the scale of some of his illustrious forebears, who include bishops, politicians, bankers and industrialists. But then it is all relative...



Peter Wallenberg

Biovitrum to buy its freedom

Biovitrum is that rarest of beasts – a biotechnology company that is making a lot of money. Now the Stockholm-based company is to use its considerable savings to buy out its major shareholder, US drugs giant Pfizer, for €41m.

"To be able to use Biovitrum's large funds to buy back Pfizer's share is, given the historically low valuation, a good deal for Biovitrum and for Biovitrum's owners," said MD Mats Petterson.

First quarter figures show that the company, which recently created iNovacia, the Nordic region's largest contract research organisation (CRO) in early drug discovery, can indeed afford such a move – it has €174m in the bank. Income was up by 115 per cent during the first quarter, to €44m, with profits of €9m.

"Biovitrum is not your usual biotech company," said Petterson. "We normally have a good income, but during the first quarter of this year this income has been particularly large."

Unlike most biotechs, Biovitrum, which is gearing up for a stock market flotation, is not only working on new drugs but also has manufacturing and sales operations. Its big earner is the protein-based pharmaceutical ReFacto, a hemophilia treatment which it manufactures for US Wyeth. Biovitrum was spun off from the former Swedish pharmaceutical giant Pharmacia, and in 2001 was bought up by venture capitalists, with Pharmacia keeping 19 per cent. That stake went to Pfizer when it bought Pharmacia. Today Biovitrum has approximately 500 employees, the majority of which are based in Stockholm.



Big-earning biotech

PR win for Ericsson boat

As sporting results go, it has been nothing to write home about. But despite being second last at time of going to press with two stages of the Volvo Ocean Race remaining, Ericsson is calling its participation in the race a success – from a PR perspective.

"From the sporting point of view, of course we are disappointed, but commercially this has been a success," Ola Rembe, head of communications for Ericsson Racing Team, told Dagens Industri.

Ericsson, skipped by Neal McDonald, and the rest of the fleet are expected to reach Göteborg – home town of sponsors Volvo, who took over sponsorship of what was the Whitbread Round the World Race – on the final leg from Rotterdam in the middle of June. They have endured 32,000 nautical miles of some of the toughest mental and physical challenges in the sailing world, including tropical storms, icebergs and 40m swells. While the telecoms giant has kept secret the size of its investment in the race, estimates are in the region of €27m. Ericsson, whose boss Carl-Henric Svanberg is a keen sailor and who is said to keep a daily check on the boat's progress, has been setting up its pavilion at each of the eight stops on the round-the-world race, and has hosted 4,000 people from 300 of the company's corporate customers.

"We do this for one reason and one reason alone – to create business," said Rembe. "To date we are happy with our investment".



Business trip

» news round-up «

Polls predict close election

With three months to go until election day in Sweden, the polls are swinging back and forth like this year's batch of drunken students celebrating graduation.

According to the latest poll, Minister Göran Persson's Social Democrats and their green and red parliamentary allies are ever-so-slightly ahead of the centre-right opposition coalition, although that lead is bound to have changed hands a couple more times before you read this.

Persson's government's has an advantage in that the domestic economy is strong, but its reputation has taken a battering this year following its handling of the Asian tsunami crisis in which more than 500 Swedes died, and by the resignation of Foreign Minister Laila Freivalds. The opposition – made up of the Moderate, Liberal, Centre and Christian Democrat parties – on the other hand, has failed to move in for the kill on its weakened prey, and is struggling to put up a united front.

All indicators, therefore, point to a pretty close result to the September 17 election, and Sweden could well join the ranks of nations such as the US, Italy and, most recently, the Czech Republic, where the outcome has come down to a handful of votes. With the differences between parties' platforms growing increasingly invisible and each trying to outdo the other on the overpopulated middle ground – and not just in Sweden – it is no surprise that these things are getting so hard to call.

Former Skandia boss jailed

Lars-Eric Petersson, the former CEO of insurance giant Skandia, has been jailed for two years by a court in Stockholm for breach of trust.

A divided court found that Petersson had unlawfully removed the ceiling in the company's Wealthbuilder bonus programme, effectively milking the company for tens of millions of euro.

Petersson, who headed the company from 1997 to 2003, was found guilty of removing the ceiling without the approval of the board, allowing him and other top executives to cream off around €17m more than they were entitled to.

Prosecutors alleged that Petersson's actions, in December 2000, had cost Skandia €20m.

Petersson, who now lives in London, was found not guilty on a charge of inflating his pension by approximately €4m more than the board had agreed. Had he been found guilty on both counts, he could have faced up to six years in jail.

He has been freed pending appeal.

Top Persson aid takes time out

Lars Danielsson, a key aid to the Prime Minister, has announced he is to take "time out" following a torrid week for the government.

Danielsson, state secretary in the Prime Minister's office, was forced to duck and run for cover after allegations were made that he had lied about his whereabouts on December 26 2004 – the day of the southeast Asia tsunami when several of his government colleagues were also conspicuous by their absence. Claims were made that he had lied about where he was to cover up an affair with a senior civil servant.

Danielsson used the pages of a national newspaper to counter that he had actually been at home with his family, apart from two visits to the office, and revealed that he was considering taking legal action against the "libelous" allegations directed at him.

"I need to gather myself, take care of my family and reflect on my situation," said Danielsson in a statement published on the official government website. "So I am taking a time out. I have up to 14 week's holiday to take."

In the meantime, the civil servant in question, one Helen Eduards, strongly denied there was any truth in the rumours. "I am not having, and have never had, a love affair with Lars Danielsson," she said. "We have never had anything other than a strictly professional relationship."

Opposition bloggers were accused of "rumour-mongering" by writing that Danielsson was with Eduards on the 26th. The bloggers, in turn, countered that the Swedish tabloids had the same information, but had chosen not to publish.

Anyone would think there was an election on...

Sweden take on the world

It has probably not escaped your attention that some men are currently playing football in Germany. Sweden has not been immune to the wall-to-wall hype and blanket media coverage surrounding the World Cup, and tens of thousands of fans have made the trip south to cheer on Henke & Co in person. No one is seriously expecting anything better than a quarter-final placing, although of course Sweden did pull a surprise in at the 1994 World Cup in the US where they came third.

Investment bank Goldman Sachs has jumped on the World Cup bandwagon, and has made some predictions based on both footballing and economic factors. It ranks Sweden in 12th place.

Key to Sweden's chances will be Henrik Larsson, Zlatan Ibrahimovic and Freddie Ljungberg. Larsson, or Henke as he is known to his adoring public, will, after the tournament, make the move from Champions League winners Barcelona to this slightly less glamorous surroundings of Swedish first division Helsingborg. "I've been away for a long time," he said. "It's time to go home."

Ljungberg, whose club side Arsenal were beaten by Barcelona in the Champions League final, has been plagued by a string of injuries to seemingly every part of his body since the last World Cup. He is hoping that his latest injury, to his right foot, will be healed in time to play.

Zlatan has struggled to find the back of the net so far this season with scandal-rocked Juventus. He scored no fewer than eight times during the qualifying rounds, and will have to find that form again if Sweden are going to make any impact.

And if they don't, the fans can always cheer on England. Swedes are big fans of English football, and Sven-Göran Eriksson's team get nearly as much press coverage in Sweden as the Swedish team does.

Swedes on the move

• Swedes are more open to the idea of migrating – either internally or abroad – than the citizens of any other EU country, new research shows.

Thirty-five per cent of Swedes move from the area they were born in, compared with the EU average of just 15 per cent. Swedes are also the nationality most willing to move abroad, and have the highest proportion of pensioners who actually do so.

The survey, carried out by the European Foundation for Improvement of Living and Working Conditions, in Dublin, was timed to coincide with the 2006 European Year for Workers' Mobility. The research, for which 24,000 EU citizens were questioned, found that it is people from northern Europe who are most open to the idea of moving away from their home region.

"In these countries, and not least Sweden, Denmark and Finland, mobility is just as great within each country as it is within the US," researcher Hubert Krieger told the daily Svenska Dagbladet. "People move mostly within their nations, but also to other EU countries, or outside the EU."

Among the reasons that encourage people to move, higher income and better working conditions are the top two among EU citizens as a whole. For Swedes, the biggest reasons are a change of environment and/or desire to learn a new language, and better weather.

"Because many pensioners took part in the

research we get what I call the 'Florida effect' – pensioners who choose to move to another climate," said Krieger. "Sweden is also at the top here. You have the most pensioners who move abroad."

Certain EU countries have more appeal to migrants than others. EU citizens are most drawn to the UK and Ireland and to a lesser extent Sweden.

"In Sweden and the other Nordic countries you have accepted a lot of refugees but have not shown the same will to accept people who come for economic reasons," said Krieger. "If this is the explanation why the Nordic countries are not so interesting to migrants, or if it is a cultural thing, no one knows."

But Krieger says the issue of internal migration within the EU is really of little importance compared with migration from outside the EU. "The big issue is all those who stand outside the EU's borders, knocking to get in," he says. "This is a whole different kind of migration, of the same sort we had within the EU 100 years ago. These are poor people who want to come here because they have no choice. And we should be putting more thought into how we will deal with them."

The research also showed how often EU citizens change jobs. They do so on average every 10.6 years, compared with 6.7 years in the US and 12.2 years in Japan. EU citizens have on average four jobs during their working lives, but in Denmark, the UK and Sweden, the number is six.



The sweet life...

Merger creates new giant

Mölnlycke Health Care has announced a merger with UK-based Regent and Medlock creating a new force in global healthcare.

The strategic fit between Mölnlycke – one of the world's leading providers of single-use surgical and wound-care solutions – Regent, which is a leading surgical supplier, and niche wound-care company Medlock, has created a group with a significantly enhanced product range and opportunities in the market.

There are also synergies between the companies in terms of sales force and distribution as well as in R&D. This, together with a more

decentralised approach by management, will create opportunities for cost savings, increased profitability and an accelerated top line growth.

Commenting on the new Mölnlycke strategy, CEO John Samuel said: "The platform for future growth is in place and now it is time for us to focus on improving and expanding our business. Our strategy is two-fold: In Surgical, we plan to take advantage of the growing market need for single use products and further expand geographically; and in Wound Care, we plan to grow the advanced wound-care business from the strong base of the market leading Safetac technology, both with innovative new products and further geographical spread."

John Samuel



Potential for growth

In Surgical, there is a rising demand for single use products and 45 per cent of the European market is still using reusable products which indicates that significant growth opportunities exist. The new surgical division will focus on the prevention of surgically-related infections for both patients and healthcare workers.

In Wound care, the market dynamics are driven by an ageing population, higher incidence of pressure ulcers and increased home-care treatment. The new Mölnlycke Health Care Group's foremost aim is to be a global company that provides marketleading solutions in its business areas.



Prime Minister Göran Persson, right, with the best man for the job, Jan Eliasson

The simple choice

• Jan Eliasson, an experienced operator on the world stage who is widely seen as a safe pair of diplomatic hands, has been chosen as Sweden's new foreign minister.

The former president of the UN General Assembly takes over from Laila Freivalds, who was forced to quit earlier in the year.

Eliasson, 65, will be able to draw on extensive experience and contacts assembled over more than 40 years of international diplomacy in his new post.

"Jan Eliasson is a person with a large international contact network and he will be able to give Sweden a prominent role in international politics," said Prime Minister Göran

Persson. "When you have access to a candidate with Eliasson's qualifications, it is a simple choice to make."

"One of the most impressive ambassadors to have served in Washington," was how former US Supreme Court judge Sandra Day O'Connor described Eliasson in the foreword to the book *The Ambassador*, which gives a

behind-the-scenes glimpse of Eliasson's life in Washington.

Freivalds resigned amid allegations she had lied to the press over the extent of her involvement in shutting down an internet company hosting a site which contained satirical cartoons of the prophet Muhammad, at the height of the cartoons row. With little international experience behind her, she never seemed to settle in the post, and had the unfortunate task of taking over the reins after the then foreign minister Anna Lindh was murdered in a Stockholm department store. Freivalds was on the receiving end, together with Prime Minister Göran Persson, of unprecedented criticism over the government's handling of last year's Boxing Day tsunami in which hundreds of Swedes died.

Widely experienced

Eliasson, on the other hand, is widely experienced in the field of international politics, having started his long and illustrious diplomatic career at the foreign ministry as an attaché in 1965. From 1983 to 1987 he was Director General for Political Affairs, and part of the UN mission mediating in the Iran-Iraq war from 1980-1986. He also spent four years as Sweden's ambassador to the UN, and five as ambassador to the US, and five years as State Secretary at the Ministry for Foreign Affairs. He has served in New York, Paris, Bonn, Washington and Harare. In 2005, he was unanimously elected President of the UN General Assembly.

Eliasson has authored and co-authored numerous books and articles, and he is a frequent lecturer on foreign policy and diplomacy. Since 1988 he has been a visiting lecturer on mediation, conflict resolution and UN reform at Uppsala University.

"I am honoured and proud," the son of a working-class family in Göteborg told reporters after the announcement was made. "We live in a changing world and must have dynamic policies. There is a respect for Swedish politics – I hope we will maintain that. I have had 40 good years, and now I want to function as a catalyst for change." Whether he gets the opportunity to be that catalyst and to hold the post longer than his two Social Democrat predecessors will be decided on his 66th birthday in September – the day Swedes go to the polls.

House of Sweden dazzles D.C. diplomats

• Acclaimed at opening ceremonies in June as a Swedish landmark in Washington DC, House of Sweden – the new home of the Sweden's embassy in the US – will also house offices, apartments and business facilities.

Bordered by parks, House of Sweden is impressively situated in Georgetown, near the heart of Washington - north of the John F. Kennedy Centre for the Performing Arts, between Washington Harbour and Thompson Boat Centre, on the waterfront promenade along Rock Creek and the Potomac.

"This state-of-the-art facility will be the site of our embassy, as well as a cultural exhibition centre... (House of Sweden) will serve as a meeting place for people and ideas from the far side of the Atlantic," states Gunnar Lund, Sweden's Ambassador to the US.

No more paying rent

The Swedish Embassy (after 35 years residing in rented spaces), the Swedish Trade Council, Swedish-American Chambers of Commerce and companies with a Swedish focus are all making their home under one roof that's purposely created as a place for business entertainment and client relations, diplomacy and interchanges between countries, cultures and people.

"Our Embassy serves not only as a place for Sweden's representatives to work, but also as an arena for the exchange of culture and ideas," adds Jan Eliasson, Sweden's Foreign Minister. Working with Sweden's Ministry for Foreign Affairs and Government Offices, the Embassy is launching an 18-month programme this autumn to publicize House of Sweden through exhibitions, seminars, debates, cultural events

and business promotional activities.

"The concept entails that we've built both an embassy and a meeting place. That's something completely new. House of Sweden will increase interest in Swedish society, culture, trade, business, research and education," says Jan Thews, has served as Project Manager for House of Sweden's owners, the Swedish National Property Board (SFV).

Designed by contest-winning Swedish architects Gert Wingårdh and Tomas Hansen, House of Sweden is a modern, translucent building that is supported by white pillars. It has five levels that are crowned by a magnificent roof terrace. "Our building is a modernistic glass construction, which is encompassed by an intricate belt of wood character. The combination of an exterior facade of screened glass with a layer of wood veneer on glass sheets behind give the building a modern, Scandinavian touch," explain Wingårdh and Hansen.

Swedish openness

"With House of Sweden we have created a vital building whose transparency symbolizes the Swedish striving for openness and dialogue. The new concept, which puts the embassy, corporate apartments and public spaces under one roof, may well serve as a model for future embassy buildings," comments SFV Director-General Bo Jonsson.

On the two lower levels that include the lobby are an exhibition hall, an auditorium and an ultramodern conference centre. Rooms and exhibition areas allow ample space for meetings, presentations, events and activities. Varying in size, 16 private apartments for professionals on levels four and five each feature a balcony with a splendid view.



A meeting place for people and ideas

Conveying a unique sense of openness and transparency, House of Sweden's glazed and elegantly illuminated facades with wood patterns set the building aglow in Washington nights. The interior decor offers artwork that is reminiscent of Swedish experiences. "Wind Catcher," an artistic creation designed by the well known Swedish designer Ingegerd Råman,

greet visitors to House of Sweden. The sculptural s a multi-part work that associates water and ice by engaging slowly running water, glass the bears frostwork patterns, and black granite. This autumn on October 22-23, precisely 30 months since groundbreaking in April 2004, House of Sweden will have its opening and dedication ceremonies.

Blue jeans are red hot



Nudie Jeans

• Sweden's biggest fashion name – retail giant H&M – has now conquered much of the world, basing its success on a mixture of low prices and free publicity generated by its celebrity designers and models.

Now a new wave of trendy labels – many of them with a strong focus on denim jeans – has emerged and is spreading Swedish chic to the fashion conscious of London, Paris and New York.

"We Swedes are good at jeans," Mikael Schiller, MD of Acne Jeans told the daily Svenska Dagbladet recently. "A lot of the big foreign companies have previously used Sweden as a test market. There is a long retail and entrepreneurial tradition in Sweden with the likes of H&M and Ikea."

Acne is one of a number of hot labels which have saturated the Swedish market and now turned their attentions abroad, opening their own stores or selling through distributors.

"Since the middle of the 90s we have seen an explosion in the number of labels," said Lotta Ahlvar, MD of Svenska Moderådet (the Swedish Fashion Council). "And in recent years there has been a huge change in attitudes. The fashion industry has become established and venture



PHOTO: COURTESY, ACNE JEANS

Acne Jeans



Wesc went west and made it big

PHOTO: JENS ANDERSSON

capitalists have started to invest in fashion companies."

Naked ambition at Nudie

Göteborg-based Nudie Jeans is one of the big success stories. The company was established in 2001 by Maria Erixson, who is a former head of design at Lee Jeans. Nudie has expanded from four to 18 employees and now has sales in 22 countries. Foreign sales were last year up by a full 78 per cent, accounting for about two-thirds of the €25m in sales. "We have actually been trying to slow things down a bit," said sales director Palle Stenberg to Svenska Dagbladet. "We have had good growth, but it could have been even bigger if we had dared to take more risks. For example we have waited five years to enter the Japanese market."

Another Swedish brand which has its roots in a well-known international label is J. Lindeberg, which sells everything from jeans to suits to sportswear. Founder Johan Lindeberg was international marketing director and US boss for the Diesel label before quitting to start his own business, helped by more than €22m in investment cash. Last year the company turned over €32m and made a profit of €1m, of which half came from foreign sales.

Wesc (We are the Superlative Conspiracy), which lies at the "street" end of the fashion scale, increased exports last year by 160 per cent. The company has an office in Los Angeles and its own stores in Beverly Hills and New York. It was founded by former skateboarder Greger Hagelin who used to hang out with some of the biggest names in skateboarding in LA in the 80s.

"Really we shouldn't be in Sweden because there isn't the same distribution for street

fashion as there is here," says Hagelin. "In Europe and the US there are loads of street fashion shops."

Wesc markets its clothing not only through the standard advertising channels but through "activists" such as DJs, artists, skateboarders and actors.

Acne growth is spot-on

Based in Stockholm, Acne Jeans has also had to put the breaks on a rapid rate of growth. Foreign sales for Acne, which was started in 1997, were up 400 per cent last year to €4.7m, making it the fastest-growing Swedish label, with a presence in 25 countries.

One brand which most non-Swedes will recognise the name of – in a non-fashion context at least – is Björn Borg. The former tennis legend went into the clothing business in 1990, and last year had foreign sales of €6.5m – up 20 per cent on 2004. Holland is the biggest foreign market, and the company is now turning its attention to the UK, Germany and France.

MD Nils Vinberg says that when it comes to establishing in a new market, he wants to do it properly. "For some labels it is enough to be sold in two trendy boutiques in Hamburg. But we want to be able to invest properly and work with distributors who build up the market with warehouses, distribution and local marketing."

But despite their common national heritage, and Sweden's strong national brand, only three of the labels – Gudrun Sjödén, Björn Borg and Filippa K – have chosen to push their Swedish identity in their marketing. "We see ourselves as an international brand with roots in modern Stockholm," said Lindeberg, in what is said to be a fairly typical attitude in the industry.

Ageing rock, classic rebel

• This year's Polar Prize has been shared by the survivors of the sixties' hard rock group, Led Zeppelin, and an unconventional classic music director, Valery Gergiev.

Awarded in May by HM Carl XVI Gustav, the 15th bestowing of the €216,000 Polar Music Prize at the Concert House in Stockholm repeated its frequent division between classic and popular music personalities. However, this occasion was unique in that none of the recipients personally performed and one recipient has been dead for over 20 years.

Although drummer John Bonham's passing in the early 80's ended Led Zeppelin's era of, albums and appearances, his daughter stood in his place along with Jimmy Page, Robert Plant and John Paul Jones. As a consolation, Plant had appeared on Swedish interview programmes and delivered candid insights about the 60's rock band. On the musical side, the Göteborg group, The Soundtrack of Our Lives,

with whom Plant has lately performed. Assisted by Nina Persson from the Cardigans and Maja Ivarsson from The Sounds, they performed Led Zeppelin melodies for the TV viewers and audience, which included Queen Silvia, Crown Princess Victoria and Princess Lillian.

The prize also went to the Russian conductor, Valery Gergiev, whose outstanding talents have caused audiences (often considered to be bound to traditions and conservative among musical aficionados) to forgive his mannerisms of casual appearance, unrehearsed concerts and lack of acute concern for punctual appearances. After missing a flight in London and arriving with a police escort from Arlanda International Airport, Gergiev – one of the youngest prize winners to date – was praised when he conducted an afternoon concert without any rehearsing whatsoever.

First awarded in 1992, the Polar Music Prize was founded the late Stig Anderson whose company, Polar Records, introduced ABBA.

Rock icons: prize winners Led Zeppelin in their heyday



PHOTO: © WARNER MUSIC SWEDEN

NCC launches new concept

• NCC, one of the leading construction and property development companies in the Nordic region, has started the manufacture of apartments in an innovative plant for residential production at Hallstahammar, Sweden.

The construction period will be halved, quality enhanced and the entire production process will be conducted indoors. As a result of this leap in industrial construction, it will be possible, to build personal apartment blocks at a lower cost than today. The concept is called NCC Komplet (NCC Complete). What is happening at Hallstahammar is unique. The traditional construction process has been replaced by a state-of-the-art order-controlled industrial process whereby 90 percent of the building is produced in a factory. The factory's 60 operators can produce fully complete kitchens, walls, floors and ceilings for up to 1,000 apartments annually. The finished modules are then transported as flat packages to the assembly hall, where four fitters and an assembly manager join the components into apartments. The fitters will complete three to five apartments per week. By installing insulation and conducting surface finishing on site, the freedom of choice in terms of energy performance and appearance is enhanced.

"The construction period is halved and costs reduced. The industrial process facilitates planning and leads to a better work environment, increased efficiency, more efficient logistics, lower purchasing prices and improved quality controls. It is a completely weather-protected process without any risk of damp-related problems," says Alf Göransson, President and Chief Executive Officer of NCC. In contrast to other industrial construction systems,

NCC will not work with choice-limiting serial type buildings. Modern 3D technology and leading-edge production processes will provide the customers' architects with considerable latitude in efforts to create personal and attractive multi-family dwellings. Lower construction costs and the ability to design buildings according to customer requirements makes it an attractive alternative for apartments based on rental rights.

NCC is investing approximately €30 million in Hallstahammar. During 2006, about 200 apartments will be produced. The first

residential building is already on site in Hallstahammar, while nearby cities Eskilstuna and Sundbyberg are next in line. NCC has already received orders for approximately 600 apartments for production in 2007.

Faster, cheaper apartments are made indoors



PHOTO: ROUF ADLERREUTZ

New web service for property buyers

RE/MAX, the world's largest real estate company, has launched a new multilingual service for foreign buyers to tap the booming overseas interest in Swedish property. The service, translates the company's Swedish real estate listings into most European languages.

"We want to make the Swedish market more accessible to buyers in the rest of Europe," said Göran Pagrot, CEO of RE/MAX Sweden. Many foreign buyers were currently interested in Hälsingland, about 270 kilometers north of Stockholm, due to a combination of low prices and attractive locations.

"Sweden is no longer a remote place. The country has become more attractive and accessible," Pagrot said.

Some 44 percent of all real estate sold in Sweden last year was purchased by foreign buyers. More than half of these were Norwegians and Danes. According to Pagrot, interest is also growing from Central European buyers.

"The Dutch are a major group, and Germans are also moving further north because the Öresund Bridge has cut journey times."

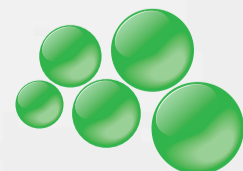


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China next to host Swedish East Indiaman

• On the far side of the world, in Canton, China, the "Götheborg," the replica of a classic trading ship from the 1740s, nears halfway following its namesakes' ill-fated voyage.

With sailors (and sailor-ettes) perched upon the rigging, the trading ship "Götheborg" will moor, like its namesake did some 262 years ago, at China's traditional sea trading port of Canton (Guangzhou).

Officials report that, from Jakarta to Shanghai, sailing when monsoon winds have stabilised, the crew will nonetheless keep a sharp lookout for typhoons...as well as pirates! In the middle of July, the East Indiaman will enter the Tiger's Mouth, the delta to the Pearl River, and lower its masts to float under power cables and bridges.

Followed closely the Chinese media since its remarkable re-creation and launching on its maiden voyage last year in October from the Swedish North Sea port of Göteborg (spelled as "Gothenburg" in contemporary English annals), the stopovers in Guangzhou, Shanghai and Hong Kong are slated to continue past the end of this year. "Götheborg" is the first such

trading vessel that's appeared in Canton in 200 years. It will receive a grand reception and ceremonies that will also be broadcast throughout the PRC.

Business matchmaking, seminars

Unlike the arrival in 1745, when the original ship brought silver to trade for tea, spices and porcelain, the second "Götheborg" is being met at its first port of call in the PRC by Sweden's King and Queen. In partnership with the "Götheborg's" primary founder, the Swedish East India Company (SOIC), the Swedish Trade Council (STC) is presenting sector-focused seminars and arranging individual meetings between Swedish companies and potential Chinese business partners. Meeting on board, the ship itself will serve as an impressive platform for doing business with Chinese companies.

The "Götheborg" is scheduled to arrive in Canton on July 18. STC plans two days of activities during July 25-26. These focus upon presenting the Swedish sectors of IT & Telecom, food, environmental technology and life science (biotech, medtech and pharma).

After Canton, the ship will sail to Shanghai and arrive around Aug. 29. In Shanghai, the



A grand reception awaits Götheborg in China

"Götheborg" will dock in the Hongkou District, not far from "The Bund" in the centre of the city. The event staging site has already become known as the "SOIC Village," and its location makes the ship visible from The Bund and also the new city area, Pudong.

STC's two days of activities in Shanghai will be scheduled between Sept. 21-26. In addition the life sciences field, STC events in Shanghai will concentrate on other sectors including health care, marine ports, shipbuilding, the event industry, design and architecture. For business image building, SOIC is arranging guided tours on board, dinner events and other business oriented activities.

Holidays in Hong Kong

Near the end of August, the ship will sail for 12 days north to Shanghai, which is the sister city of "Götheborg's" home in Sweden, Göteborg. Thereafter, the East Indiaman will travel another 10 days, or 900 nautical miles, to Hong Kong, where they should celebrate both Christmas and New Year. Early in January, the "Götheborg" will sail for Singapore, a 21-day and 1,450 nautical mile journey, where they will take a two-week layover as well as a crew exchange. Thereafter, the ship will make a short, 4-day voyage to Port Klang in Kuala Lumpur, where they are expected to arrive around the middle of February and remain for about ten days.

In 1745, a disastrous climax marked the original three-masted wooden trader's homecoming. As relatives and crowds on shore watched, the first "Götheborg" rammed a reef at the entrance to Göteborg's harbour and swiftly

sank in deep water. Although the crew survived, most of the cargo was sacrificed. Salvage over the centuries recovered some pieces, including huge amounts of porcelain shards that hand today in the Göteborg Opera House's mezzanine.

50 years ago, in 1956, Sweden was the first



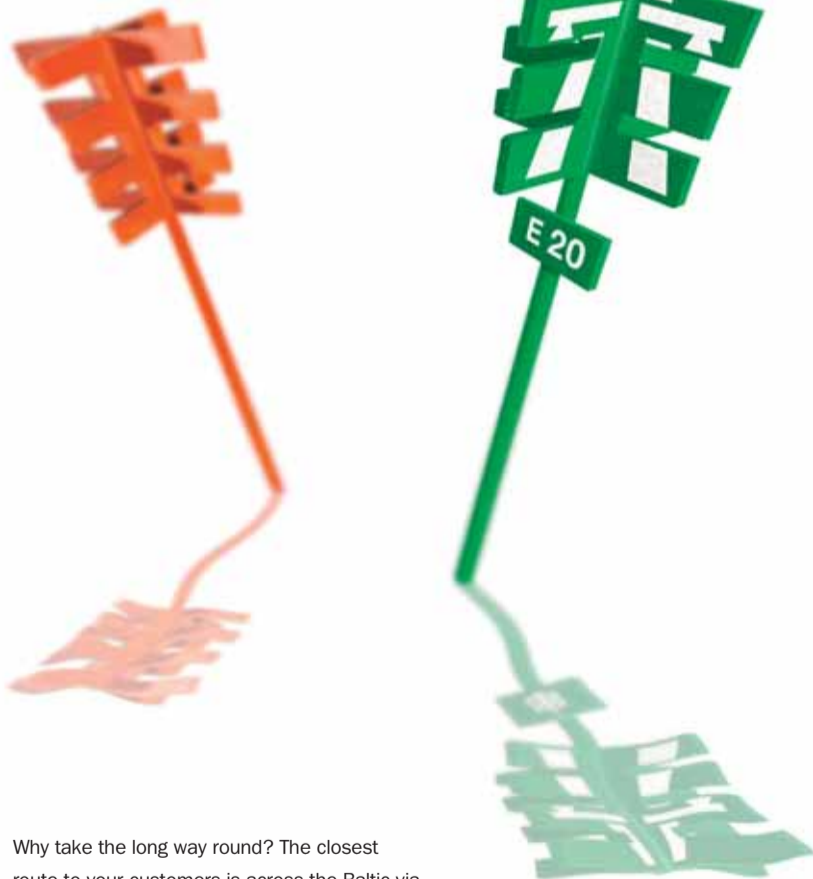
Australian Kimberley Stacey enjoyed her stay onboard

Western nation to resume diplomatic relationships with the Peoples Republic of China. In November 1996, Sweden's current Prime Minister, Göran Persson, visited China and, during various ceremonies, inaugurated the new Swedish General Consulate in Shanghai. According to a report from the Swedish Foreign Ministry, Sweden is working toward a broadened exchange and cooperative effort with China within the areas of trade, investments, technology, science and culture.

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Green Passport for ships

To ensure secure shipping through a ship's whole lifecycle, there is now a "Green Passport" for ships. It is a "declaration of contents", in which all hazardous materials and substances are listed.

Ship recycling contributes to sustainable shipping and is the most environmentally friendly way of disposing of ships. It is virtually possible to re-use every part of the hull and the machinery. The principle of ship recycling is a sound one, but the working practice and environmental standards in recycling facilities often leave much to be desired.

To handle the problem, and to make sure the recycling of ships is kept as environmentally friendly as possible, the IMO (International Maritime Organisation) adopted "Guidelines on Ship Recycling" in 2003. In the guidelines there is a paragraph that describes and defines the Green Passport. The Green Passport is a document that applies the guidelines to provide information on materials known to be potentially hazardous. They are frequently utilized in for example the construction of the ship, its equipment and system.

The guidelines have identified a number of potentially hazardous materials and also make a distinction between new and existing ships. In the case of a new ship, the ship owner is expected to minimize the use of hazardous materials already in the design and construction stage. For existing ships, the owner should prepare a Green Passport in accordance with the guidelines and also minimize the generation of hazardous waste during the operation of a ship.

Full steam ahead for shipping

• Buoyant world economic conditions and a reputation for quality, safety and sound environmental practices have combined to make the Swedish shipping industry today more successful than ever.

Profits are up, orders worth billions of euro for new vessels have been placed, and an expected change in the tax laws will further boost the fortunes of Sweden's shipowners.

"All the shipowning companies are very successful today, regardless of which field we are in," says Dan Sten Olsson, CEO of the Stena Group, which includes the world's largest passenger shipping company and one of the largest tanker shipping companies, and has a turnover of more than €3bn.

The shipping boom is being driven in part by the likes of India, China and the Far East importing huge quantities of oil, steel, coal and other raw materials to feed their growth. This demand is using up all available tonnage the world over, and pushing up freight prices. The rapid economic growth in Sweden's backyard market of the Baltic States has also benefited the nation's shipowners.

"But it is also a reflection of that we in Sweden have got new conditions for competition, which has had the effect that a lot of ships have come under the Swedish flag, and also that a lot of shipowners have a number of new ships on order," says Olsson, who is also chairman of the Swedish Shipowners' Association, which celebrates its centenary this year. "At the moment there are more than €20bn ships on order."

Besides the Stena Group, Sweden is home to a number of other leading global shipping companies. The privately-owned Wallenius Lines is one of the world's biggest transporters of cars, shipping around two million cars and trucks each year in its fleet of 40 vessels. Göteborg-based Broström is among the leading maritime logistics companies for the oil and chemical industry, and nearly doubled its profits from 2004 to 2005.

"One of Sweden's strengths is that we try to do quality shipping," says Olsson. "Also, we have for a long time worked with environmental questions. And if you look at complaints by flag states, the Swedish flag comes out on top of the list for having least complaints against it." Sweden's accident statistics are also among the lowest in the world.

Longest coastline

Sweden's industry and the economy in general are heavily dependent on shipping. About 90 per cent of the countries imports and exports – 177 million tons last year – pass through its ports. Among the biggest exports are cars and trucks and products of Sweden's large forest industry, while oil is among the biggest imports.

"You could say we are like an island," says Håkan Friberg, managing director of the Swedish Shipowners' Association. "We have one of Europe's longest coastlines, so without the shipping industry we would have a lot of trouble exporting timber and cars."

Swedish-owned vessels account for the majority of ferry freight to and from Sweden's ports, and about 40-50 per cent of oil and other



Sweden is home to a number of leading shipping companies

bulk products. Sweden in particular is strong when it comes to product tankers in the 5,000 to 40,000-ton range. "Here Swedish shipowners have a very good market position," says Friberg. "In Europe, we control about 35-40 per cent of the market for product tankers. I think this has been partly out of tradition, partly due to new regulations, and partly because we have been able to meet the demands of the customer. The oil companies have been very clear about security and environmental issues after some big accidents, and we have been very close to the customer on those issues and been able to fulfil their demands."

World leader

Swedish ships became a fixture on the high seas when the country industrialised rapidly at the end of the 19th century. The Swedish Shipowners' Association was formed in 1906 to deal with seamen's unions on a national basis. "It was like the Wild West at that time in some of the ports," says Friberg. "The shipowners were not satisfied with that so they wanted to come together and make this more of a central organisation for the business."

By 1919 the Swedish fleet consisted of more than 2,500 vessels – compared with 568 today – and Sweden soon emerged as one of the world's leading shipbuilding nations, with the Götaverken shipyard the world's single biggest shipbuilder during the 1930s. A high point for the Swedish shipping industry came after the Second World War, but then followed a long slide down in fortunes until the end of the 1990s.

"Then we joined the European Community

and overnight there was a change in the industry," says Friberg. "Because then we were part of the European market with its regulations, and that was good for Sweden's shipping industry. This brought us on to an equal level with other countries in Europe, and that has been very important for us. Without those changes I don't think we would have had the kind of development of our companies as we have had."

The one aspect of EU shipping policy which is still missing for Swedish shipowners is the tonnage tax. "If you sell a ship under that system and you make a profit, you don't have to pay tax on it, but you can save it within the company and invest it when the time is better for buying or building a ship in the future," explains Friberg, who sat on a government commission which assessed other tonnage tax systems. "Under today's system you are losing money in the tax system. That is very important for the shipping industry in Sweden that we implement the tonnage tax system." The tonnage tax issue will go before the government after September's election, and Friberg is confident that the new system will be brought in. "We have discussed this for many years with the government and the Department of Finance. I think the majority of parliament is in favour of this system now, so I am optimistic."

Future planning

The Swedish Shipowner's Association has joined together with two leading universities to establish a competence centre which will keep the industry supplied with highly-trained employees in the future. "Like other sectors we have an age structure that means a lot of people will be retiring in the coming years, and we could face problems getting people into the industry," says Friberg. "We are engaged in a project called Lighthouse, together with Chalmers University of Technology and the School of Business, Economics and Law at Göteborg University. We have formed this competence centre with them to put efforts into research and the education system in Sweden. This is very important for the future of the industry. There is a lack of seafarers worldwide today and it will be even worse in a few years, so we have to prepare for the future and we need involvement from the industry so we get the right people, the right competence and that we have the research in the right areas for the shipping industry." The ten-year project will cost about SEK 1bn, of which the Swedish Shipowners' Association will contribute €10m.

Friberg says that the continued success of Sweden's shipping industry depends very much on the developments in China and the Far East. "But generally worldwide trade is increasing every year and that will be good for the industry," he says. "I don't see any big changes in the near future anyway, and the level of new investment among shipowners shows their optimism."

Olsson adds: "We have a number of leading companies in the field so I think we are very optimistic that we can keep developing in this positive way."

DAVID WILES



Dan Sten Olsson, left, and Håkan Friberg



Factbox Swedish shipping:

- There are 568 vessels under Swedish control, with 226 under the Swedish flag
- The deadweight of the Swedish fleet is 2.4m tons
- A further 65 vessels are under order from Swedish shipowners
- Global freight costs have more than tripled in the last 25 years
- 350m passengers have travelled to and from Sweden by ferry in the last ten years
- Ships emit less than half the CO2 per ton km compared with rail and road transport
- About 90 per cent of shipping industry are members of Swedish Shipowners' Assoc.
- SSA has offices in Göteborg, Stockholm and Brussels

Biggest port goes for growth

PHOTO: GORAN ASSNER/GÖTEBORG & CO

• The Port of Göteborg, already by far Scandinavia's largest port, is investing heavily to more than double its capacity in the coming years.

The port is the gateway to the entire Nordic region for imports from around the globe, and the departure point for everything from Finnish paper to Swedish cars bound for overseas markets. Göteborg is now marketing itself as the optimum hub for goods heading to and from the booming Baltic states, access to which by sea is limited to smaller vessels.

"Our catchment area is not just the Scandinavian countries but also the Baltic states, Russia and Finland which we connect to the rest of the world," says the port's president, Magnus Kärestedt.

"It is part of our business to serve the whole country and the whole region."

The Port of Göteborg was actually founded before the city itself – 1620 compared with 1621 – and for some years it was Sweden's only outlet on the west coast at a time when the coast was ruled by the Norwegians and the Danes.

Among the recent investments by the port

has been a four-year, €75m project to improve access from the open sea. "Before we had one good fairway and one extra fairway," says Kärestedt. "Now we have two really good independent fairways to the open sea. They have been straightened out, deepened and broadened and we can take the biggest vessels in the world."

Competitive advantage

Kärestedt says the investment has given the Port of Göteborg a competitive advantage. "Today in the shipping industry you don't measure distances, you measure time. If you have good fairways it is easier and faster to connect to the port."

The project also had environmental benefits for the area by making passage safer for oil tankers, reducing the risk of accidents and the resulting pollution, as well as another unexpected one: the number of lobster in the fairway has actually increased since the work was carried out.

Kärestedt says the aim is now to double the volume of cargo handled at the port within seven to eight years. That will in part be done through changes in terminal layout and new equipment. In September the port will take delivery of new super post-panamax cranes that will be able to

handle the next generation of container vessels, and there will be further investments in new trucks and new quays to increase capacity. Last year €59m was invested in the port.

"Our port has capacity today and we know that capacity is a selling point," says Kärestedt. "There is a lack of capacity in the whole of Europe at the moment. We try to maintain this advantage. We are investing to take the next step in our development."

But Kärestedt is keen to ensure that development and expansion do not take place at the expense of the environment. The port has been recognised for its work to protect the environment, being awarded in 2004 the Clean Marine Award from the EU. "This is a good sign that we are on the right track with green issues," he says. "It is really important that we show society that we work seriously with environmental questions. For example one of our recent investments was in connecting ships to electricity so they can switch off engines when in port, reducing air pollution."

There is also gas recycling to reduce emissions when filling oil tankers, and the port's vehicles use low-emission fuels. Fees are also reduced for visiting vessels that use fuels that pollute less.

Smooth connections

Besides its strong environmental credentials, it is Göteborg's location and its smooth connections with the wider region that are its main selling points. Key to this are its rail links, and the railways are today responsible for an rapidly increasing volume of goods passing through the port. "Rail is the quickest growing segment today, growing by more than 20 per cent of the volume of goods to and from the port," says Kärestedt. "This is because of the good infrastructure and the good concept we have together with the different operators on the railways. We can connect around 20 different locations daily in Sweden and Norway and have a shuttle system to and from the port on regular schedules. This has been a real success."

The destinations covered by rail shuttles include Oslo, Karlstad, Södertälje/Stockholm, Insjön/Borlänge, Helsingborg, Malmö, Eskilstuna and Gävle. More rail shuttles are on the port's wish list.

Kärestedt says the Port of Göteborg's advantages have enabled it to achieve a good balance between imports and exports. "That is the trick in the shipping business, to have this balance between in and out."

D W

Industry leads environmental action

• The Swedish shipping industry was among the first to recognise its responsibility to the environment, and is today leading the drive for more sustainable ways of moving freight by sea.

"For a long time the seafarer thought that the ocean was so big that you couldn't affect it and it didn't really matter what you did with it," says Bertil Arvidsson, head of unit for environment, technology and R&D at the Swedish Shipowners' Association (SSA). "But today we are all very aware of the risks and that we have to do something."

Arvidsson says that Sweden's shipowners' concern for the environment probably goes further back than that of other nations. "The fact is that Swedish shipowners built double-hull tankers far before there were requirements for them, just because they didn't think they had the right to pollute," he says. "But of course we see environmental action as a business opportunity too, we don't make a secret of that. We think that there will be a requirement for environmentally-friendly shipping in the future."

Sustainable solutions

There are two main environmental issues in which the SSA is active: emissions reduction,

and accident prevention. In emissions reduction, SSA has joined with among others Stena, P&O, and the Norwegian Shipowners' Association in Shipping Emissions Abatement and Trading (SEAA), and industry group which aims to raise awareness and acceptance of solutions for emissions reductions that are sustainable, cost-effective and achievable.

Arvidsson says that while waterborne transport is the most environmentally-friendly mode of transport, there is still scope for large reduction in emissions of sulphur dioxide and nitrogen dioxide (SO_x and NO_x respectively).

"The problem is not that it cannot be done, as we already have the technical solutions," he says. "The problem is how to make it happen without increasing the cost burden on waterborne transport, making it more costly which means you are moving waterborne transport over to land-based transport and making the environmental situation in the EU worse."

SSA's solution to this is an emission trading system similar to that already in existence for CO₂. "To make it possible for shipowners to invest in this kind of equipment or to use low sulphur fuels, they have to have some kind of payback, and that is what they will have in the emissions trading scheme." The European Commission has expressed an interest

in the idea, and a demonstration project has shown that it would be feasible.

The other leg of SSA's environmental work concerns the prevention of accidents and groundings. "Minimising the risk for collision and grounding is an important way to reduce the risk of pollution that comes from oil spills," says Arvidsson. "We can't afford a big accident. We are aware of that and therefore are asking

the Swedish government to speed up the implementation of a traffic control system in the Baltic Sea." A similar system in operation in the Gulf of Finland reduced the risk of groundings and collisions there by 80 per cent in just one year. SSA has been in discussions with the Swedish government on this issue, and was due to bring it up at North Sea Conference in Göteborg in May.

The shipping industry is working to protect Sweden's coastline



PHOTO: BO LIND/STIC/WWW.MAGBANK.SWEDEN.SE

Ports look to the future

Sweden's ports, through which about 85 per cent of Sweden's imports and exports pass, are planning to invest more than €850m by the end of the decade.

The ports range in size and activity, from the ferry ports in the Stockholm region and in the south with their connections to neighbouring countries in the Baltic, to the major container ports of Göteborg and Helsingborg, to the bulk ports of the north for iron ore and forest products.

Swedish ports are unique in that most are organised as limited companies following the mergers of the former port authority and the stevedoring company. This has been successful in its aim of reducing costs and increasing efficiency. According to Ports of Sweden, the national industry and employers' organisation, the mergers have resulted in a more flexible administration and planning, and the ports' customers favour the system of integrated port companies both managing the infrastructure and providing port services as there is only one party to negotiate with.

Sweden's ports are currently waiting on parliament to decide on the government's transport policy bill. Maria Nygren, Ports of Sweden's deputy MD and chief operations officer, says this is the hot topic in the industry right now. "With the new white paper from the government on transport policy they have written about the necessity of having a national port strategy for Sweden," she says. "They will appoint a high-level politician to investigate the needs in ports and to see what is important from a national point of view. That will also influence later on how the government wants to invest in road and rail infrastructure. While in the port areas there is no government money, that will also influence the investments the ports will plan for themselves."

Call for responsibility

The industry is hoping that parliament will take into account the proposals of the government-appointed cargo transport delegation which has called for the state to take greater responsibility for infrastructure in some key strategic nodes, and that clear and transparent criteria are found for how to prioritise public financing. The dele-

gation has also called for the planning and financing of the maritime infrastructure to be better integrated into the overall state infrastructure process; port infrastructure has until now been under local government responsibility.

Sweden's notoriously stringent environmental laws are also a challenging issue for the nation's ports. "We have quite tough environmental legislation," says Nygren. "There is a law for example that prescribes that all ports must obtain permission to carry on their operations. That means consulting with local authorities, with communities, with non-governmental organisations and so on. They apply for this permission and the regional authority will perhaps give permission saying there will be restrictions on what the ports can and can't do. That is tough legislation but many have passed already and most ports underway with this big job." Dredging and air emissions are other environmental issues for the ports.

Ports of Sweden was co-hosting the 2006 annual conference of the European Sea Ports Association in Stockholm. The conference was expected to conclude with concrete suggestions on how European decisionmakers could proceed with the development of an adequate Europe-wide framework for sea ports.



Thousands of cars pass through the port of Malmö

Stockholm boosted by Baltic growth

Stockholm is ideally placed to capitalise on the ongoing boom in maritime commerce in the Baltic Sea region.

The city, known primarily for as a passenger destination for both ferry and cruise passengers, is now waiting to start work on a large new development which will give Sweden a major deep-sea port on the east coast.

"The market in the Baltic was really only between Sweden and Finland during the Cold War years, but now that we have the rapidly-growing market of the EU countries around the Baltic and Russia, things are looking much more interesting," says Christel Wiman, MD of Ports of Stockholm.

Trade in the eastern Baltic region has increased by 350 per cent over the last ten years, and that upwards trend is expected to continue as trade increases between the new EU states and the rest of Europe. The ports of St Petersburg and Gdansk, with their relatively close proximity to Stockholm, are increasing in cargo volume by around 40 and 50 per cent respectively, and Wiman believes Stockholm will benefit from this growth in its backyard.

The Ports of Stockholm Group comprises the ports in Stockholm, Kapellskär and Nynäshamn. The Port of Stockholm is the central port for freight and passengers to and from Finland, Russia and the Baltic states. The port at Kapellskär, 90km north of Stockholm, handles rapid freight services to and from Finland and Estonia, and Nynäshamn, 60km south of Stockholm, has links to Visby in Gotland, Gdansk in Poland, and Ventspils in Latvia, supplement the central port.

The central port is the base for ferry lines carrying goods and passengers to Mariehamn in Åland, Turku in Finland, Helsinki in Finland, Tallinn in Estonia and Riga in Latvia, plus container ships to and from Finland, Germany, Belgium and the UK.

Better accessibility

Wiman says the development of Nynäshamn will boost Stockholm's accessibility and freight handling capacity as well as having environmental benefits. "Stockholm is a very historic and old port in an old city and we have an archipelago with four hours of fairway," she says. "It is very beautiful, but not very practical when it comes to modern shipping."

The development of the new port will allow the central port to focus more on passengers, while the Ro-ro and container traffic moves outside the city.

"This will give Sweden a modern port on the east coast," says Wiman. "Sweden has a very long stretched coastline making it more like a long island than anything else. We have a very good port on the west coast, a good port in the south but we have no really good cargo port on the east coast. This will be the one."

Construction of the port, with an infrastructure budget of around €200m, is expected to start in late 2007 or 2008. It will be able to handle in the range of 500,000 TEUs, plus Ro-ro traffic.

Nynäshamn will be a long-term solution

Broström expands European fleet

Broström has, together with Erik Thun AB, signed an agreement to build a further two product tankers at the shipyard Ferus Smit B.V. in the Netherlands.

The vessels, of 7,500 dwt, ice class 1A, will be owned by Broström and Thun on a 50/50 basis and they will join Broström's service on the North European market. The vessels will be delivered in March and in July 2009. Since earlier the co-operation with Thun includes among others eight sister vessels, the G-vessels, that were built at the same shipyard and are operating in Broström's fleet.

Our common investment in the G-vessels has turned out very well. We face a continued increased demand for safe and reliable transports and with a fleet of ten sister vessels we create opportunities to offer an effective transport solution to our customers," says Lennart Simonsson, CEO of Broström.

Broström has together with its partners a newbuilding programme entailing 21 vessels to be added to Broström's commercial fleet in the next years.

Transatlantic extends links with Stora Enso

Transatlantic and Stora Enso have signed a five-year contract for increased cooperation on seaborne transports to and from the Gulf of Bothnia. A year ago, the parties signed a 15-year contract, by which Stora Enso time-charters three newly built container/RoRo vessels from Transatlantic for the transport of forest products from the ports of Kemi and Oulu in the Gulf of Bothnia to Göteborg and Lübeck. The new vessels will be delivered during the second half of 2006.

The extended cooperation involves Transatlantic, in its turn, hiring a certain amount of cargo space in the vessels from Stora Enso for the transport of third-party cargo, which are products that have no direct connection with Stora Enso. Transatlantic has formed the subsidiary TransLumi Line AB to market and operate this new business.

At full implementation at the end of 2006, the four ports will be served three times weekly. TransLumi Line will offer transport possibilities for container and RoRo cargoes according to the various port conditions. Cargo transfers to other shipping companies will be offered in Gothenburg, where TransLumi Line has its head office.

At the end of 2006 TransLumi also plans to launch a feeder route for overseas containers from the Gulf of Bothnia to Hamburg and Bremerhaven. This service will complement Transatlantic's current scheduled services to Germany for containers.

"This development is entirely in line with our strategy of increasing our activity in the Baltic Sea region, with a focus on the forest products industry. TransLumi Line has considerable and attractive potential and is expected to successively generate a favorable earnings contribution for the Group," says Transatlantic's CEO Håkan Larsson.

"This is meant to be the long-term answer – it is not meant to just to cope with today's demands, but the demands of 2030 and onwards," says Wiman. "We are building this port according to the market's needs."

On the passenger operations side, Stockholm is expecting a record year this year. A higher than ever number of cruise ships are already booked in for this year at Nynäshamn and Stockholm before the cruising season has even got under way. As many as 260 vessels are booked in to bring a quarter of a million foreign passengers to the city between May and October – 22,000 more than last year. Eleven of these ships will be coming for the first time. Last year's 276 ships was an increase of 51 over the previous year.

Big earner

About 11.5m passengers – ferry and cruising – pass through Stockholm's ports each year, plus 4.5m more using local archipelago services. Ferry traffic generates €325m annually for the city's finances, and cruise ship traffic alone



Christel Wiman: responding to the shipping market's needs

generates €22m every year through tourist spending.

The number of cruise passengers is growing year on year and has doubled in the last seven years.

"It was said at the Miami Sea Trade that the hottest destination for cruising today is St Petersburg," says Wiman. "But when you are cruising you need more than just one destination, and just opposite St Petersburg you have Stockholm, so you could say that we are part of the Baltic package. In surveys of passengers, when they are asked why they have gone to the Baltic they answer to go to St Petersburg. But when they have been on the tour and are asked what they enjoyed the most, Stockholm figures highly. We know St Petersburg has more magnetism, but we know that people have been very satisfied when they have been here, and they want to come back."



Stena invests big in offshore

• Stena, one of the world's largest groups within the shipping sector, with a turnover of €4.5bn, is investing heavily in the offshore business.

Daughter company Stena Drilling's order with South Korean Samsung Heavy Industries for a €460m-plus deepwater drillship – the Stena DrillMAX – which is the group's largest single investment ever made, is believed to have raised Stena's investment in oil exploration to €1bn.

The 228m-long Stena DrillMAX, which can drill in extreme conditions down to 10,000ft and is set for delivery at the end of next year, will meet the rapidly-growing demand for drilling rigs and drilling ships worldwide. When it was placed, the order was said to be a risky one, with no customers lined up, but according to the daily Dagens Industri, Stena Drilling now has a contract with a consortium of oil companies who will lease the vessel for nearly half a million dollars a day for five years.

All of Stena's business units – which include ferry and freight operations, recycling, property and freight – have improved their financial and strategic positions in the last year.

The Stena Sphere consists of the three parent companies which are wholly owned by the Sten A Olsson family: Stena AB, Stena Sessan AB and Stena Metall AB, in addition to their wholly or partly-owned subsidiaries. The partly-owned company, Concordia Maritime AB, is quoted on the Stockholm Stock Exchange, and 52 per cent

of it is owned by Stena Sessan AB.

The biggest earning business area is the Stena Metall Group, which recycles and processes metals, paper, electronics, hazardous waste and chemicals. Its operations also include international trading in steel, metals and oil. Stena Metall Group is the biggest recycling and environmental services in the Nordic region with an income of nearly €75m, up 12 per cent on 2004.

Stena Line, one of the world's biggest ferry operators, also continues to grow. Profit for 2005 exceeded expectations at €28m, which was more than double the figure achieved the previous year, thanks to strong growth in the freight business in all markets.

Stena Drilling's sales of €204m were helped by energy companies'



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Dan Sten Olsson

rush to find new oil and gas deposits and develop existing fields, and the company is planning for new operations in the Gulf of Mexico, West Africa and Australia.

CEO Dan Sten Olsson said the Stena Group could look to the future with confidence. "Provided energy prices do not go wildly high and the US economy does not collapse, the conditions for our business in total are better for 2006 than was the case for 2005."

Samskip expands in Sweden

Icelandic shipping company Samskip will strengthen its presence in Sweden by opening offices in Göteborg and Helsingborg. The Helsingborg office – planned to open in September – will be the company's Nordic and Baltic hub. The Göteborg office, opened in June, will represent Samskip's Icelandic container services and the intra-European services of two subsidiaries, Geest North Sea Line and Van Dieren Maritime.

"Göteborg is the main transport and logistics area in Sweden and is the largest port in the Scandinavian and Baltic Sea area. We need to be where our customers are," said Birna Ödefors, managing director of Samskip's Swedish subsidiary.

Customers in central and northern Sweden will benefit from access to Samskip's European short-sea network, its services to and from Iceland and its rail service from the Ruhr in Germany.

"Our Swedish customers are quality oriented but cost conscious. Also, they are demanding more environmentally efficient and competitive transport solutions within Europe."

Environment

Energy

Sustainability

Climate

Technology

Swedish technology cleans up abroad

Sustainability on the waterfront at Hammarby Sjöstad

PHOTO: VICTORIA HENRIKSSON

• In these days of receding glaciers, rocketing oil prices and flood catastrophes blamed on global warming, more and more attention is being focused globally on sustainable energy and waste solutions.

Sweden has emerged as a leading nation in environmental technology, and having proven its solutions on the home market, not supplies around the world everything from power plants fuelled by household waste to advanced treatments for removing harmful chemicals from industrial waste.

This environmental technology sector has grown to one of Sweden's most important, expanding by around eight per cent per year, and creating thousands of new jobs. Order books are bulging at the hundreds of mostly small and medium-sized companies that can be found the length of the nation as foreign customers, from governments to municipalities to industry, look to draw on Swedish expertise from bioenergy to mapping coastlines threatened by pollution.

"Sweden's environmental technology companies are doing good business," says Rutger Engvall, head of the Swedish Environmental Technology Network (Swedentech) at the Swedish Trade Council. "The Swedish image is very strong, and Swedish competence and know-how are at the forefront globally."

Engvall says there are a number of factors that affect the marketplace. "We have growing concern for the environment due to catastrophes like the flooding of New Orleans and the tsunami," he says. "Then there is concern about oil prices which makes both governments and individuals think about alternative sources for energy. There is of course also a great concern for water supplies in many areas of the world, especially in developing countries with the problem of supplying clean water. All these are changing the market for environmental technology in a positive way."

Engvall says that growing public awareness of environmental issues has an impact on governments and other decisionmakers. "Even the Bush administration is today expressing concern about the environment."

Award-winning solutions

Recent export successes for Swedish companies

include a €5m deal for Envac for an automated waste collection system for the France town of Narbonne. Lund-based Läckby Water Group, which specialises in water treatment and biogas production, is reporting success after success in China, and as a result more than tripled its profits from 2004 to 2005. Meanwhile Termo-Deck, which makes ventilation systems where the building structure itself works as an energy store, has won a number of prestigious prizes in the UK, including the Prime Minister's Better Public Building Award for 2005.

So why has Sweden of all places emerged as a leading player in environmental technology? "One of the main factors is that we were one of the early starters," says Engvall. "In the 1960s we started to put the fight against pollution on the political agenda. During the journey up to now we have had very fruitful public-private partnerships between municipalities and the private companies and together they have developed technology and systems within water and sewage and waste handling and so on. Then we had the Stockholm conference, the first really global conference on the environment in the early 1970s which inspired Swedish companies and decisionmakers." Engvall adds that Sweden's traditional strengths within engineering were also important when it came to developing new environmental technologies.

Areas in which Sweden is particularly strong include water supply and wastewater treatment technology, which accounts for about 40 per cent of companies in the sector, and the rapidly growing bioenergy sector. "Here Sweden's knowledge and competence are at the forefront due to the fact that we have traditionally had a strong forestry sector and it has grown out of that."

An integrated view

A Swedish concept which is gaining international attention is the Sustainable City. Conducted by the Swedish Environmental Technology Network together with the Ministry for Foreign Affairs and the Ministry of Sustainable Development, the Sustainable City offers a holistic concept for sustainable urban planning.

"The concept is to make an integrated view on urban planning," says Engvall. "This means that you take all different supply systems for the city – water and sewage, energy, transportation, urban functions, green areas and so forth



Rutger Engvall: 'We were one of the early starters'

– into consideration when you plan the city. It also includes the 'soft' parts like public awareness, public participation, IT solutions and so on."

The idea is that all these aspects should be planned and integrated from the very beginning. "An example could be that you produce electricity from sludge from your sewage treatment plant, or that you use household waste to generate power and heat, which you then distribute through district heating. You are not planning each area separately, but planning them together and integrating all these different areas. You plan the traffic in a manner so that you reduce the air pollution and increase the liveability of the city."

The Sustainable City concept has become reality in a number of places around Sweden, including Hammarby Sjöstad in Stockholm, and these examples have inspired other cities in their approach to sustainability.

One of the world's largest urban development projects in Toronto is one of them.

Following a visit to Sweden by bosses of Toronto Waterfront Revitalisation Corporation, Swedish experts were called in to do review of the entire project, adding a large dose of sustainability to the plans.

Similar work is being carried out on cities in western China, and the UK is now also collaborating on sustainable urban planning.

Meeting demands

Engvall says the Sustainable City concept can be adapted to all kinds of urban areas. "We have included in the concept an implementation strategy which works regardless of size and technology. You can have low, medium or high technology, and can apply it to small, medium or large cities. We claim that we have technologies and systems and products that can meet any demand. If you want to make very simple traffic solutions, you can start with walkways and cycling lanes to improve the traffic situation, or you can use very sophisticated high-end futuristic traffic systems with small driverless cabs running on tracks above the ground. There is the full scale of different solutions. And it applies to existing cities as well as new cities."

The Swedish Environmental Technology Network is a sector programme within the Swedish Trade Council. It aims to promote and support new business possibilities in environmental technology through joint actions, and offers international actors contacts with the Swedish environmental technology industry.

The network includes about 700 different consultants and suppliers to the sector. A key part of its work is arranging visitor programmes for delegations and individuals as well as assisting in finding partners for international bidding.

To the existing focus areas of water, air, and waste technologies has been now been added renewable energy – bioenergy, solar power and wind power, plus energy efficiency. "Swedish bioenergy is a very important area and there is a high demand for bioenergy solutions," says Engvall. "I sometimes say that we should try to make Swedish bioenergy what the Danish did with windpower. They are the leading country in windpower and Sweden could be that with bioenergy, but it will mean working together on all levels in society, and then we will have a success story."

Blue, yellow and green

• Some people think it is because of the Allemansrätt law which gives more or less unrestricted access to the Swedish countryside. Others think it is because, in this relatively sparsely-populated country, there is just so much nature.

Whatever the reason, Swedes take their commitment to the environment seriously. This can be seen in the fact that is a higher percentage of "green" cars – those running on biogas or ethanol – on the roads here than anywhere else in Europe; in the nation's second place in the world Environmental Performance Index; and in the government's recently-announced intention to break the country's dependence on fossil fuels by 2020.

The Swedish government has also set 16 Environmental Quality Objectives, the aim of which is to be able to hand over to the next generation a society where the main environmental problems have been solved. Plus a Ministry of Sustainable Development has been established, and sustainable development is now an overall objective of government policy and must be taken into account in all decision making.

So Sweden has cast itself in the role of "World Environmental Conscience", and its business and political leaders can often be seen and heard on the international stage promoting the Swedish example and urging others to get on board. When it comes to the environment, the country aims to practise what it preaches.

Showing the way

"There are those who say that it doesn't matter what we do in a small country like Sweden when pollution continues in other places," Prime Minister Göran Persson said at the recent World Bioenergy conference and exhibition in Jönköping. "I definitely do not agree. Of course we can't stop climate change on our own, but we can show the way."

Persson said that the threat of climate change, and tackling it, was "essentially, a deeply moral question, a question of solidarity".

"This is because the poorest, those who already live in the most vulnerable places around the world, are those who will be hardest hit by climate change. They are the ones who will be driven from their homes. Here in Sweden we will also be affected, but we will manage better according to our forecasts. Not well, but better."

Persson went on to say that the world also owed it to future generations to act immediately against climate change. "What message does

it send that we inherited a world from our parents that was in better shape than the one we leave to our children? What right does our generation have to destroy the climate? This deeply moral question has only one answer. We do not have that right. That same moral demands that we try to do something about it."

Oil-free future

One way to do something about it is to reduce the nation's thirst for oil. Within 15 years, the idea goes, no Swedish house should require oil for its heating needs, and drivers should not require petrol or diesel for their cars. This is the most radical and ambitious plan introduced by any nation, but is a continuation of a trend which has been ongoing since the oil crisis of the early 1970s, when 77 per cent of Sweden's energy came from oil. Today that figure is about 30 per cent, thanks in part to widespread use of bioenergy-fuelled district heating.

A broad-based oil commission made up of industrialists, car makers, farmers and academics has been appointed by Persson to look into the issue. Public hearings have been held on the subjects of if and when oil will run out; the potential of forest- and agriculture-based fuels to plug the gap; and reducing dependence on fossil fuels for transport and heating and power production. The commission is expected to report to parliament later this year.

In an interview with Sweden Today, Sustainable Development Minister Mona Sahlin said no country should be dependent on what is a finite resource. "Climate change is the greatest and most important environmental challenge of our time," she said. "Most of the world's climate researchers agree that the Earth's climate system is changing, and in order to slow down these changes, emissions of greenhouse gases must be reduced. In the long run, the objective is for society to obtain all its energy from renewable sources."

"A Sweden free of fossil fuels would offer enormous advantages, not least by reducing the impact from fluctuations in oil prices. Breaking dependence on oil brings many opportunities for strengthened competitiveness, technological development and progress, for every country in the world."

Intensified effort needed

Sahlin said the government had set the ball rolling by taking a number of steps to promote the switch from oil to other energy sources. "We already have several programmes running,



Mona Sahlin: 'We must break dependence on oil'

like tax relief for conversion from oil, a green certificate system to stimulate renewable electricity, measures for renewable fuels as well as a strong research programme," she said. "But an intensified effort will still be needed. A part of this is to strengthen the effort on commercialisation of scientific results."

Sweden is among the biggest investors in research and development measured per capita in the EU, and Sahlin said the government intended to make sure that remained the case in the environmental technology area.

"Funding for energy research was raised in the 2005 budget by SEK 270 million [€29m] for 2006-2007, and SEK 370m [€40m] for 2008. The emphasis on this effort is on energy efficiency and renewable energy. Intensified commercialisation is also an important part of this."

The environmental technology sector in Sweden is one of the world's most mature, due in part to the fact that the country has no oil or gas reserves of its own and so has always needed an alternative. Bioenergy drawn from the by-products of the country's huge forest industry is one example, and together with the burning of household and industrial waste these renewable sources currently provide about 25 per cent of Sweden's power, heat and transportation energy demands.

Sahlin said the sector, the growth of which is measured in double figures, had the potential to become a major export industry for the nation. "Environmental technology is Sweden's eighth-largest export trade, and 90,000 work in the environmental sector. The green sector is impor-

tant to environmental, economic and socially sustainable development. The idea to look into the energy sector and new building techniques is an issue of special interest and Sweden has a lot to offer. The Swedish experience is well known and biomass is a dominating fuel for district heating in Sweden."

No nukes

Unlike in the UK, where Prime Minister Tony Blair recently endorsed a new generation of nuclear power stations to help tackle global warming and secure a domestic energy supply, Sweden intends to break its oil addiction without using the nuclear option. "I believe that nuclear power must be phased out in a planned and responsible manner," said Sahlin. "In the long run the objective is for society to obtain all its energy from renewable sources."

Partly due to quirks of geography but also thanks to a strong environmental conscience among both the Swedish public and this and previous governments, Sweden has been ranked first in Europe and second in the world for environmental performance. The 2006 Environmental Performance Index, which is produced by experts at Yale and Columbia Universities in the US and topped by New Zealand, ranks countries on 21 elements of environmental sustainability including endowments of natural resources, water resources, past and present pollution levels, and environmental management efforts. Sweden also came top in the environmental health category, and had the best air quality in Europe.

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Volvo launches hybrid technology

Earlier this spring, Volvo launched an efficient hybrid solution for heavy vehicles which offers fuel savings of up to 35 percent.

"We envisage opportunities to accelerate developments in commercially viable hybrids for heavy vehicles. This can be significant for both our customers and for the environment," says President and CEO of Volvo, Leif Johansson.

The Volvo Group's hybrid concept provides maximum fuel-saving effects on routes with frequent braking and accelerations, for example, city bus traffic, city distribution, refuse collection and construction work. Calculations indicate that fuel savings can amount to 35 percent.

"There is a growing interest in the market to reduce fuel consumption, driven by the uncertainty surrounding the physical and political availability of oil and climate change issues. Accordingly, many customers are seriously reviewing how they can contribute to reduce the dependency on oil. We now have a technology that is interesting from a commercial viewpoint", says Leif Johansson.

Volvo is also participating in the development of a new type of battery, Effpower, which is based on proven lead-acid technology used in start batteries in today's vehicles. Through this new technology, the power output has been doubled, while at the same time manufacturing costs for the batteries can be significantly reduced.

"The hybrid is a long-term and highly interesting solution. We are aware that oil prices for our customers will rise, and therefore, all solutions that reduce fuel consumption are highly attractive. The diesel engine in our hybrid solution can also be operated using biofuels, and consequently, transport activities can be conducted without carbon dioxide emissions. This paves the way for interesting developments toward long-term sustainable transport solutions," says Leif Johansson.

Vattenfall boss throws down green gauntlet

• State-owned Vattenfall is the fourth-largest generator of electricity in Europe, and the largest generator of heat, with annual sales of nearly €14bn. Surprisingly for a major energy player, the company is on something of an environmental crusade, recently announcing a €4.3bn investment in renewable sources of energy. And, as he tells Sweden Today, group president and CEO Lars G Josefsson is on a personal mission to curb climate change.

Of all the people calling for a drastic reduction in CO₂ emissions, the boss of one of Europe's main emitters is probably among the least likely. Vattenfall generates a whopping 167.1 TWh of electricity across Sweden, Poland, Germany and Finland each year, with operations in Denmark starting this summer. A sizeable chunk of this comes from coal-fired power stations, which are among the worst CO₂ polluters.

But Lars G Josefsson is a man who is clearly under no illusions about his industry's effect on the environment. He is not only willing to stick his neck out and say that something has to be done, but he also has a solution. He has spent much of the last two years travelling the world speaking to his industry peers, the UN, and politicians and leaders including British Prime Minister Tony Blair and US Energy Secretary Samuel W Bodman, about Vattenfall's plans for a global emissions trading scheme.

"For me this is a personal commitment and sort of a mission," he says. "Being in the position I am, I have a responsibility to act. I am able to act, and I have access to a lot of data and know-how which must be used."

Josefsson's conviction is a pragmatic one, driven as much by long-sighted business sense as by environmental fervour. "I believe that this is a very important mission from the pure business standpoint as well. As I see it, if we don't get to a converging global solution we will risk a lot of very very costly distortions in the world system, the world order, and that would be detrimental for a lot of businesses. My line of thought is that this is a great opportunity for global corporations to demonstrate that they can take responsibility for an orderly development of the world."

Product of frustration

Vattenfall's plan, Josefsson says, was brought about in part by frustration that no one else was doing anything about it. It involves setting global CO₂ emissions limits for the next 100 years, and recognises that the only way to make this work is to make use of market forces with a global system of emissions trading. It also tries to cater to nations at both ends of the economic scale. "We have to take care of the poorest countries and the richest countries," says Josefsson. "The poorest countries should have no burden at the beginning of their development. If you are below a certain poverty threshold you should have no caps on your emissions until you reach a certain level, then you should have them. Likewise for the richer countries; of course they emit more and they should reduce more, but you should put a limit on the rate reduction, because if you don't you can risk causing abrupt change and depression in the economy and a lot of unnecessary distortions."

Josefsson says his plans have generally been well received. "There has been a lot of encouragement and a lot of people saying this is exactly what we think, and that they would like to support us."

The irony of a large energy firm taking the initiative on a topic normally steered by NGOs and politicians is not lost of Josefsson. "I realise that is unusual, but that is also part of my point," he says. "The traditional role of industry will have to change. Instead of following or even resisting change, industry will have to become proactive and lead the way. In the development of the world at the moment, indus-



Groundbreaking technology: from left, Vattenfall's Europe chief Klaus Rauscher, German Chancellor Angela Merkel, Brandenburg Premier Matthias Platzeck, and Vattenfall CEO Lars G Josefsson get work started on the CO₂-free lignite power plant

try is much more globalised than politics. And industry has a responsibility that it should not deny. For real change to be made, it has got to be made through the decisions of thousands or millions of managers around the world. So this is the key thing: how do you combine solving important global environmental issues with the market economy? I think this is so important that we can show the way in this field. That is also a part of what, to me, is very important and very stimulating in trying to achieve."

Coal and climate change

When it comes to reducing CO₂ emissions, Vattenfall appears to be willing to put its money where its mouth is. Work was started in May



Agneta Rising: taking on the environmental challenge

on a CO₂-free lignite power plant in Germany, and Federal Chancellor Dr Angela Merkel was on hand for the groundbreaking ceremony.

The plant, which is the first of its kind in the world, is based on so-called oxyfuel tech-

nology. The aim is to capture the CO₂ created during the electricity-generating process and then liquefy it in order to be able to transport it to another location for storage.

"The significance of this plant is quite clear," says Josefsson. "If you look at the problem of climate change, it inevitably has to be solved through new technology – that is new technology that brings in low-emitting sources, whether in the energy or transportation sector. The other conclusion you can easily draw is that the burning of coal is something that has to be made compatible with curbing climate change. This means that the significance of what we are doing in Germany cannot be underestimated, because this is a very practical way of making coal burning compatible with curbing climate change."

Agneta Rising, Vattenfall's environment director, says the company's commitment to the environment goes beyond climate change. It encompasses everything from the protection of the flora and fauna around hydroelectric dams and powerline corridors, to using old electricity poles as a source of biofuel.

"We have the ambition to be number one for the environment," she says. "We will manage our operations in an open way with effectiveness and accountability, and for each type of technology we use we strive to be the best in the world."

She says investments are continually made to ensure that technologies, from biofuels to hydroelectric to coal-fired, are modern, efficient and effective. "And we have the earth perspective, not only in the operation an energy source, but also what is upstream and downstream. Where do you get the fuel from and how do you take care of the waste? And ultimately, when you have decommissioned the site, you leave it back as a green field."

"Our goal is to work so that our operations have very little impact on the environment, and that where they have an impact, to really take that challenge, go through with it, and see what the best is that we can get out of the situation."

Minister launches climate change campaign

• Environment Minister Lena Sommestad challenged the Swedish people to "turn down, switch off and recycle" at the national launch of a new Europe-wide campaign against climate change.

The European Commission's You Control Climate Change campaign urges everyone to do their bit for the environment and help reduce greenhouse gas emissions by, for example, lowering the thermostat and switching off the TV rather than leaving it on standby.

"After many years of robust politics and the setting of ambitious environmental challenges, Swedish climate policy is today strong, both within the EU and internationally," said Sommestad at the Swedish launch of the campaign.

"We are pushing this environmental work forward through reducing our emissions nationally and by reorganising our energy system. By doing so we can be part of, and have an effect on, international climate negotiations. In my experience, people listen to us."

The EU is today responsible for around 14 per cent of global greenhouse gas emissions. It has been in the vanguard of international efforts to tackle climate change, committing as early as 1990 to stabilising its emissions of CO₂. It was also instrumental in negotiating and implementing the 1992 UN Framework Convention on Climate Change and its 1997 Kyoto Protocol.



Lena Sommestad with fellow environment ministers

PHOTO: ANETTE ANDERSSON

The European Commissioner for the Environment, Stavros Dimas, said: "People may say that their individual behaviour does not matter; I say – on the contrary. Households in the EU count for a large part of the EU's total greenhouse gas emissions, so each of us has a role to play in bringing down emissions. Our campaign will provide citizens with information about climate change and their role in combating it. Doing the right thing is not as difficult as it seems." The EU is also working internationally to help countries outside of the EU tackle climate change. In 2005, the EU agreed a number of groundbreaking new climate change partnerships, notably with China and India. They include cooperation on practical solutions to promote energy efficiency and renewable energy through cooperation in newly-established energy panels between the EU on one hand, and India and China on the other.

"For the Commission, action against climate change is a priority," said the President of the European Commission, José Manuel Barroso. "This campaign complements and reinforces our political and legislative efforts. It makes clear to what extent we all are responsible for climate change and what individuals can and need to do to limit this threat."

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The lynx is part of Sweden's rich diversity of animal life

Sweden raises bar on environmental action

• The ambitious challenge Sweden set itself to undo damage done to the environment has now been made even more demanding.

To the 15 existing Environmental Quality Objectives (EQOs) adopted by Swedish parliament in 1999 has been added a 16th, and the bar has been raised higher on a number of the others. The aim is to be able to hand over to the next generation a society where the main environmental problems have been solved.

The 15 original objectives include reduced climate impact, clean air, a non-toxic environment, a balanced marine environment, thriving wetlands and sustainable forests. To reach these goals, public agencies, organisations, enterprises and individuals in Sweden are all expected to devote more effort to environmental issues and sustainable development. Even big business, in the form of the Confederation of Swedish Enterprise (Svenskt Näringsliv), has given the EQOs its backing.

At the end of last year the Swedish parliament added a 16th objective – a rich diversity of plant and animal life. "This will be one of the more challenging objectives," says Robert Andrén, head of secretariat at the Environmental Objectives Council, which was set up to promote consultation and cooperation in implementing the EQOs.

The objective states that biological diversity must be preserved and used sustainably for the benefit of present and future generations. Species habitats and ecosystems and their functions and processes must be safeguarded, and species must be able to survive in long-term viable populations with sufficient genetic variation. People must also have access to a good natural and cultural environment rich in biological diversity, as a basis for health, quality of life and well-being.

Clear vision

Three interim targets have been set for the new objective. Target one is that all loss of biological diversity in Sweden will be halted by 2010. Target two is that by 2015, the conservation status of threatened species in Sweden will have improved to the point where the proportion of evaluated species classified as threatened will have fallen by at least 30 per cent compared with 2000.

The third interim target is that by 2007, follow-up methods will have been developed with a view to ensuring that biological diversity and biological resources are used in a sustainable manner, and by 2010 biological diversity and biological resources will be used in a sustainable manner, so that biodiversity is maintained at the landscape level.

Andrén says that when the original 15 were launched, biodiversity was seen as a part of many of the objectives so a separate one was

not needed. "But during the last five years we have seen developments on the international level," he says. "The World Summit in Johannesburg and the EU summit in Göteborg pointed towards a clear vision of halting loss of biodiversity by 2010, and those international objectives that Sweden has agreed to needed to be taken on-board in a more concrete way in our system."

In addition to the new objective, some modifications have been made to existing interim targets – mainly to make them more stringent. "Some of the targets have been made tougher in terms of timescale and scope," says Andrén. One such case has been on air pollution due to increased private car use and studded winter tyres causing an increase in harmful airborne particles. There are also new interim targets, including one on cadmium and dioxins in food products.

To monitor to what extent progress is being made on the objectives, they are evaluated each year, with a more in-depth evaluation every four years. Andrén says that the level of progress that has been made so far is to an extent in the eye of the beholder.

Glass is half-full

"I think we should look at it from the 'glass is half-full' perspective," he says. "We have 16 objectives and ten of these we assess as highly possible to achieve, although we need to intensify our efforts. For the other six it seems to be fairly difficult to reach them, and that is mainly due to the dependency we have on other countries to act." Andrén says that the Swedish goal of having a balanced environment in the Baltic, for example, is dependent on Russian and EU actions.

Earlier this year the Environmental Objectives Council adopted a programme for the next comprehensive in-depth evaluation, which is to be delivered in 2008. It will be the basis for the government bill and the subsequent decision by parliament on amending or adding resources to the ongoing environmental work.

"Two key things we have emphasised in the council programme are an increased transparency in the whole working process, and also the fact that we will this time demand that agencies analyse the consequences of new proposals as far as possible – not only the need for new measures from an environmental perspective but also what are the consequences from an economic and social perspective," says Andrén. "We do that in order to show the factual need for resources to reach a sustainable society and we want to have a better picture of what the effect will be. That is very important to find new and innovative solutions on environmental problems and to get a better understanding of having a sound and clean environment, to show that environmental concerns and economic progress go hand in hand."

Environment funding boost to aid poor

• Swedish expertise in environmental issues is being put to use in developing countries to help poor people improve their living conditions.

"Environmental problems are global problems, but they hit poor people the hardest," says Maria Norrfalk, director general of the Swedish Agency for International Development Cooperation (Sida), a government agency within the Ministry for Foreign Affairs. "It is the poor who become seriously ill from pollution and toxic dumping, whose homes are destroyed by natural disasters and who see their ability to provide for themselves wiped out by mismanagement of resources. The whole fabric of society is threatened when environmental damage reduces the amount of available living space."

More than 50 per cent of Sida-supported programmes and projects have environment as either the prime objective or an important component. Mats Segnestam, head of the environment policy division at Sida, says: "This reflects that we have been quite successful in integrating environmental aspects into what we do. It is just as important to think through the environmental aspects – be they positive or negative – in everything we do as it is to support specific environmental initiatives."

Sida, which already spends more than €215m a year on environmental projects, recently announced an extra €25m a year for initiatives where the environment is the prime objective.

Segnestam says that while Sida believes very strongly in responding to demand from its collaborating countries, when the additional funds were received from the government six areas were selected where it was believed interventions would be of particular strategic importance. "The first of these is water and sanitation, which we think is a crucial area," he says. "There is competition now both between countries and within countries for water for various purposes.

Sweden has developed a very sophisticated strategy in this area."

Leading institutions

The second focus area is chemicals. "What we are seeing now is a chemicalisation of the world, and it is not just the immediate health risks but the longer term effects of hormone-like substances and so on," says Segnestam. "Sweden has tried to deal with this, and the Swedish Chemical Inspectorate is a very effective government body which we collaborate with."

Sida will also concentrate a part of its resources on helping develop sustainable cities in the developing world. "There are a number of urban-related problems that need to be solved, including the issue of bringing nutrients back to the soils," says Segnestam. "There is virtually a one-way street with regard to food products being brought into cities meaning nutrients are not being brought back to the soils. Plus there are also transport issues, waste management issues and pollution issues."

Sustainable use of natural resources is another focus area. "There are a number of sub-areas here, one of which to my mind has been neglected far too much is the marine coastal zone," says Segnestam. "Fisheries are being depleted and therefore primary protein to millions if not billions of people are being destroyed."

Capacity development in environment will also benefit from the increased funding. "There is an absolute need to build analytical capacity with regard to linkages between environment, economics and social issues," says Segnestam. "Building institutions around the world is key to not only analysing but also implementing policies and legislation and to dealing with environmental sustainability issues. We have chosen these areas because we think that Sweden has something to offer here, because we have knowledge and expertise in these areas and are prominent from an international point of view."



PHOTO: JOHAN BERGQVIST
Maria Norrfalk: 'Environmental problems hit the poor hardest'

Sida, which has over 750 employees, is active in about 120 countries, mainly concentrated in Africa, Asia and Latin America, and has field offices in 50 countries. About 60 per cent of Sweden's overseas development aid is channeled through the organisation.

Sida has a large number of projects ongoing in which environmental issues are addressed with the aim of helping poor people. It runs a major programme in environmental economics with training and education, and supports centres of excellence in various parts of the world. It funds the Swedish International Biodiversity Programme

(SwedBio) through which it supports various initiatives for maintaining biodiversity and ecosystem services. Sida also supports various programmes for water management, such as the Global Water Partnership. It helped the development of a national environmental institution in Vietnam, and supports Nabuur, the first entirely web-based environmental organisation in the world, where communities in developing countries can present their issues and ask for assistance from online volunteers. These are but a few of the several hundred environmental initiatives being supported by the organisation.

Big biogas order tops record year

• Läckeby Water Group has secured a multi-million-kronor order to build the world's biggest biogas plant in Göteborg.

Announcement of the new plant, which is based on new technology which is virtually emission free, comes at a time of continued successes for the group, with sales last year up 30 per cent on 2004. Profits were up more than threefold during the same period, and group president Hans Malm expects more of the same after a strong start to this year. "We have had a record year both in terms of turnover – which is now up to €65m – and a very healthy profit to go with it," he says at group headquarters in Lund.

"We have managed this because we have been better than our competitors at creating delighted customers. This success puts us in an excellent position when it comes to further growth, further development of technologies and further development of markets. And we will certainly take this opportunity," Malm has set a goal of €220m in sales within five years, which he expects to reach in part due to a strong performance in China, and partly due to the group's early decision to invest in biogas technologies.

"Läckeby Water Group recognised back at the beginning of this century the importance of biogas, and the importance it would have for the sustainable growth concept," he says. "I am proud to say that we have now completed our seventh biogas plant, at Borås, in Sweden."

The recently-announced Göteborg Energi plant, which will receive digester gas from the city's wastewater treatment plant and refine it into principally vehicle fuel, will utilise the Cooab technique developed by Läckeby Water Group in cooperation with Dutch company Cirmac. Malm says that existing treatment techniques release about three to four per cent methane to the atmosphere. "So you not only lose energy that could go to the vehicle, but you also release methane – which causes global

warming at 20 times the rate of CO₂ – to the atmosphere, and so you lose many of the benefits of biofuels by doing so." The Cooab technique, by contrast, releases just 0.1 per cent.

Far-sighted decision

"We were far-sighted enough to bet on the right technology," says Malm. "We are putting together our ability to take different waste to make biogas, with our ability to take that gas

to make vehicle fuel without contaminating the environment."

Malm says the nature of the material that fuels biogas plants makes it important for those active in the field to be experienced. "We have experience of most of these types of material, everything from slaughterhouse waste to industrial organic waste to household waste in which you find all sorts of things. The technology you use to receive it has to be forgiving so that you can

keep running the plant even though there is a battery or an umbrella coming in with the waste."

Malm says Läckeby has the necessary experience and comprehensive references on the Swedish market, and is ready to take these technologies abroad on a project export basis.

Läckeby Water Group is one of the ten largest companies globally in the water and wastewater treatment sector and has carried out projects in nearly 70 nations. It is made up of three divisions: Purac, concerned with contracting for treatment of wastewater, process water and drinking water, as well as innovative treatment of biological waste; Läckeby Products, which develops products for the mechanical treatment of water and sludge; and Läckeby Service, which offers service, maintenance, renovation and rebuilding of water and wastewater treatment works and pumping stations.

Skill and presence

Malm says Läckeby Water Group is a keen participant in the Swedish government's ambitions to tackle pollution and encourage sustainable growth globally. "The Swedish government has set aside €100m for environmental aid over the next three years, and there is a growing dialogue between the industry – through Swedish Project Export – and the government to use not only money as such, but also the resources and the competences that are within Swedish industry. Money is not enough. You need to have the skill, you need to have the geographical presence, and you need to be able to take action in a systematic way in remote areas.

"In Sri Lanka, for instance, it is not enough to hand over a bag of money; you need to be present there and need to be able to navigate the issues that are particular to that country. We are now present in countries like Sri Lanka and are determined to continue to make use of this type of aid to get the most for the money for the people who really need it."

PHOTO: CICI JONSSON
Hans Malm: creating delighted customers



Smooth startup for giant paper mill

Esperanza Aguirre, President of the state of Madrid, signs the guestbook at the launch of Holmen's new paper machine, flanked by Manuel Robles, left, mayor of Fuenlabrada, Holmen chairman Fredrik Lundberg, right, and mill manager Anders Öquist, far right

• The startup of Holmen Paper's new €306m paper machine in Madrid, which will serve the booming Mediterranean newsprint market, has exceeded the company's expectations.

One of the most advanced machines of its type in the world, the PM62, which uses recovered paper as its raw material, was brought online without any serious hiccups and is predicted to reach its full operating capacity ahead of schedule.

"We have had a very successful start up so far," says Anders Öquist, mill manager at Holmen Paper Madrid. "We have been able to follow and even go above the startup curve, and have exceeded expectations both from a production and a quality point of view."

Holmen Paper has tapped into an exciting market in Spain and its neighbouring countries, a market which up till now has mainly been served by imports. Newsprint consumption increased by 12.5 per cent between 2004 and 2005, compared with an average of just 1.5 per cent for the rest of Europe.

"This is a huge import market and it is great to be here in Madrid, in the middle of Spain, with all these advantages regarding logis-

tics and being close to our customers for quick service and response," says Öquist. "So we have a very good set-up here, not only for supplying Spain and Portugal, but also Italy and Southern France are areas where we will take market share now."

Challenging project

The Holmen Group, which traces its origins back nearly 400 years, is among the top five largest producers of newsprint and magazine paper in western Europe. It is among the top three producers of improved newsprint, telephone directory paper and coloured newsprint, and among the top three producers of virgin fibre-based paperboard. Its five business areas are Holmen Paper, Iggesund Paperboard, Iggesund Timber, Holmen Skog and Holmen Kraft. The group employs around 4,900 people and produces annually around 2.4m tonnes of paper and paperboard.

In 2000, Holmen bought what was then called the Papelera Peninsular Mill in Madrid and in 2004 decided to invest heavily to capitalise on this growing market. Öquist says the challenges in setting up the new machine included handling the sheer weight of administrative work – permits and the like – demanded by the aut-

horities, and creating a team from people with different languages and from different cultures and, in the case of the Spanish employees, people with little experience of the forest industry.

"Madrid is not well-known for industry in general, and the forest industry even less," says Öquist. "They do not have the same tradition as we are used to in Sweden, where the forest industry has been a base for industrial activity for such a long time, and where we have always had a network of other mills to discuss with."

Unable to hire the necessary qualified and experienced workers from elsewhere in Spain, key positions were filled by employees from the existing paper machine at the site, combined with young, enthusiastic people from the Madrid area.

Proven technology

"Of course we have had to put more effort than normal into education," says Öquist. "What we have done here is recruited people with technical or production backgrounds because the thinking is that people with a technical education have a better base from which to understand the process and technology around the machine, compared to just picking someone off the street."

But Öquist says that when it comes to the

technical side of the startup, there were fewer unknown factors. "On the technical side, the whole idea of the project was to choose well-proven technology, so I think that has shown to be a wise decision," he says. "I think compared to other startups this has been a very smooth one so far. The machine is very easy to start after shutdown and it usually takes just ten to 15 minutes after we have put the pulp on the wire until we have the paper on the reeler. We have a startup curve that in theory ends in 2010, but I'm quite sure that we will reach full capacity of 300,000 tons per year before this if we just extrapolate the trend we have seen in the last five or six months."

Then new machine needs to be fed with hundreds of thousands of tons of recovered paper each year, an appetite which as yet cannot be met through local collections. Holmen Paper is part-owner of a recovered paper company in France and another in Portugal, and owns outright Carpa, which is the largest recycling company in Madrid.

Environmental priority

Paper recycling levels in Spain are not as high as in Sweden, and so Holmen Paper embarked on a project with Aspapel, Spain's forest industry association, to promote paper recycling. "In the last four to five years we have put enormous efforts through Aspapel to increase collection rates, and they have increased from about 50 per cent three years ago to close to 60 per cent now," says Carl Sundberg, Holmen Paper's vice-president business development. "It has achieved more than one million tons of increased collection in the last three years, which is quite astonishing. We have a team going out to municipalities to study how they collect paper and to suggest improvements like new collection system, more containers, an increased number of collection routes. We have also started to work with offices which have not had any collections so far."

Within three to four years, Holmen's southern European operation should be self-sufficient for its recovered paper needs. "When we deliver paper we will be able to bring recycled paper back," says Sundberg.

He says using recycled paper in the production of newsprint makes sense from both an economic and environmental perspective. "It is a combination of both. It started with pressure from environmental groups, but today with new techniques it is the best solution from a technical, quality and environmental point of view, with far lower energy consumption today. The environment is a priority for us."

DW

Forest industry leads world on green issues

• Sweden's forest industry is at the forefront globally when it comes to environmental issues, according to the head of Skogsindustrierna, the Swedish Forest Industries Federation.

Reduced energy consumption and investments in environmental protection measures have been key to limiting the impact on the natural surroundings of an industry which accounts for 12 per cent of Sweden's exports and employs one in ten of its industrial workforce.

"The environment is crucial for the forest industry and environmental matters are a priority," says Marie S Arwidson, MD of Skogsindustrierna. "I think we could say that we lead the world on environmental matters in the forest industry. We are an industry working towards more sustainable development, and we produced Sweden's first branch report on sustainable development last year. I would say that the environmental as well as the social and economic pillars of sustainable development are key to the success for this industry."

The industry spends more than €200m annually on environmental protection through investments in, for example, effluent treatment plants, filters, scrubbers, waste management equipment and noise-reduction measures.

Arwidson says the pulp and paper industry has taken great leaps forward in reducing emissions to air and water. "It can be clearly shown that there has been a dramatic reduction to very low levels," she says. Sulphur compounds, formed during the chemical pulp production process and energy production, have been radically reduced over the past 30 years due in large part to replacing oil by biofuels such as black liquor and bark.

"Also we have increased the efforts in energy efficiency in our processes," says Arwidson. "We can also show a big reduction in energy consumption per unit of production. However, the big 'but' is that this is a successful and growing industry, and therefore we see an increased demand for electricity in the future. Environmental matters today, more than emissions to air and water, are focused on energy, and this is the key topic today, not only in Sweden and the forest industry but globally."

Sustainability helps competitiveness

The Swedish forest industry has pledged to employ the most efficient means of transportation with lower emissions, as evidenced by the increased use of ships and rail. "But still we are of course dependent on lorries to transport the wood from the forest and also to trans-



Generation game: the growing forest industry will require more electricity in the future

port to the harbours and the railway loading stations," says Arwidson. "Here there is some political pressure to increase taxation and we are following this very closely. We have of course a disadvantage in the location of our production compared with the main markets, and therefore we have to be very efficient in transportation."

Arwidson says that despite the successes in significantly reducing its environmental impact, work will continue to further increase the sustainability of an industry which is the nation's biggest net export earner. "I think we can claim

that we are and have been successful, and we have invested a lot to become competitive, but this is an ongoing process and work continues every day on the three pillars of sustainable development. Here we have the great support of our unions where we both agree that sustainable development is important for the companies' competitiveness.

"With a successful outcome you create a good economy for the company and good employment for the region, and benefit the environment, so it is a win-win situation. But it is hard work that must continue."

Burning with optimism

• Until recently, KMW ENERGI had been able to trade on its reputation. It is so well established in its home Swedish market that there has not been any real need for marketing.

That enviable state of affairs is now changing, with the company eyeing exciting new overseas markets where its reputation for high-quality biomass-burning combined heat and power (CHP) plants has yet to reach.

KMW ENERGI was founded in the mid-50s and has carved itself a niche as one of the leading suppliers of biofuel combustion plants to Swedish municipal heating companies. Its plants can run on anything from peat and waste wood to briquettes, exceed Sweden's stringent emissions control regulations, and are known for their reliability and low maintenance costs.

Forecasts for turnover this year are in the region of €27m, but with the European and American markets starting to see the benefits – both environmental and economic – of the biomass fuels that are today so widespread in Sweden, expectations are that that figure could double in as little as two years.

"We have not been very active on the market," says sales manager Christer Rosendahl. "We sit here in the office and business comes to us. We are so well known in the Swedish market that we don't have to get out and tell people that we are here. But this is our home market, and now we are starting to look abroad we will have to be more active in advertising and marketing." Besides Europe, the Caribbean – with its plentiful supply of waste from the sugar cane industry which makes for an ideal fuel source – and the US are also being targeted by KMW.

"There is huge potential in Europe and even more in the US market," says Rosendahl. "They are just at the beginning with this type of technology. There is the potential to sell thousands of plants over there. If we can take one per cent of the European market it would be too much for us."

The Norrtälje-based company has entered into a joint venture to take on the US market. "You have to be in place on that market to succeed," says Rosendahl. "We are now at the stage where we have to increase the company with new employees and new investment."

Reassuringly expensive

Tried and tested Swedish quality comes at a price. When KMW ENERGI quoted for an installation in Portugal, its offer was 60 per cent higher than that from a local company. "But they do not compare apples to apples. The quality is not the same," says Rosendahl. "People will see that in a year or two. What we try to do is give them life-cycle cost calculations. That will show them they will earn more money in 20 years with our equipment compared with another company's. This is a new area for the European market, and there are not many companies that can do this. Some can, but not with the quality. The market knows that Sweden is very good at this, and I would say we have the best equipment in the world in this range at the moment."

Rosendahl says that what customers get by investing in the higher-cost option are a number of advantages, one of which is flexibility in fuel. Another is the ability to use fuels with a high moisture content: from ten to as high as 65 per cent moisture, while still being able to meet demands on emissions and power effect. There is also the flexibility in the power load. "That is one of our strengths, being able to go very very low in power while keeping the emission guarantees," says Rosendahl. "That is very important. We guarantee 20 per cent low load, but we know that we can go lower, while still keeping to emission limits."

Rosendahl says the export possibilities for KMW ENERGI are virtually limitless now that the rest of the world is catching on to what in Sweden is a tried and tested technology. "The train is leaving now, and we intend to be on it."



Ljungby district heating plant uses KMW technology

Biographies of forest products' lives

• Rather than the "from cradle to grave" expression, it's more accurate to describe how STFI-Packforsk records, examines, analyses and assesses the life cycles and environmental impact of wood fibre products as a "seed back to soil again" story.

Operating with the motto of "turning science into reality" and prominent as one of the world's leading R&D companies in the fields of pulp, paper, graphic media, packaging and logistics, STFI-Packforsk AB's activities range from basic research to direct commissioning.

Officially established in 2004, STFI-Packforsk is the combination of a three-part merger of traditional pulp and paper industry research (STFI) with graphic media industry studies that are further joined by Packforsk's packaging activities. "Bringing these together has among other things resulted in environmental and sustainability issues coming more into focus," says Maria Enroth, senior research associate. "Our advantage as a research company is our extensive knowledge and familiarity with the forest-based industrial sectors."

Sustainability indicators

One example of the broad selection of activities and projects conducted by STFI-Packforsk addresses Sustainability and Environmental Indicators. Indicators reliably communicate companies' sustainability and environmental work, which in turn provides knowledge for improvements, employee motivation and company imaging. Common indicators within a field also permit benchmarking individual companies, and this can be communicated to employees, customers, the public and authorities.

"We have clients around the world," says Enroth. "Our traditional customers are international pulp and paper groups. Other clients are in the fields of packaging and graphic media." At the end of the value chains, the packaging and media companies are often smaller in size, and they have needs for concrete assistance and tools.

"For example, we've developed environmental and sustainability indicators for graphic media companies," she says. Working today with 20 Swedish newspaper publishers, STFI-Packforsk has developed a model for working with common environmental indicators for the graphic arts industry. "Significant aspects of sustainability might involve the amount of paper used for the products, and the indicator would include the

amount of paper waste that's involved in production. Energy consumption, transportation, chemicals and hazardous waste are also aspects of our environmental indicators. For six to seven years now, our systems have been used by graphic media industry to determine facts regarding significant aspects for companies.

"In the packaging sector, we have an indicator activity that we call the shopping basket. It shows how much packaging material is used per product in a typical shopper's grocery cart," says Enroth. Furthermore, also in the area of packaging, it is important to not only consider the packaging itself, but also the product within. Besides leaving so little environmental burden as possible, packaging should provide protection so that spoiled contents do not present threats.

"We hope to contact companies and organisations that can make use of our competence within the area of sustainability for forestry based products. We provide companies with working procedures – or 'tools' – that enable them to more easily grasp these issues and to tailor their products and processes for sustainable development. Simply stated, we make their work easier."

Life-cycle assessment

"In our environmental work, we use a tool for life-cycle assessment that records the entire environmental imprint of a product, service – or combination thereof – from cradle to grave," says Martin Johansson, project manager sustainability. "When we translate environmental work to sustainable development work, we likewise have the ambition to develop life cycle assessments (LCA) into sustainability impact assessments (SIA)." He adds that in SIA, except for environmental aspects, social as well as economic aspects are also included.

Right investments

"With the development of sustainable impact assessments, we will be able to reveal to companies and organisations which areas and in what manner their products or services that relate to fibre-based materials' life-cycles cause effects to various environmental, social and economic aspects. Our work makes it easier for firms to invest in the right measures and at the correct places, and to get the most out of their investments," says Johansson.

STFI-Packforsk has head offices in Stockholm and branches in Kista, Örnsköldsvik and Trondheim. Last year, group turnover reached €31 million among their business areas of Exploratory Research (35 per cent), Industrial Research (40 per cent) and Consulting (25 per cent). STFI-Packforsk has 270 employees.

Martin Johansson and Maria Enroth: turning science into reality



China invests in Swedish bioenergy

The State Grid Corporation of China, which is the largest energy company in China and the world, plans to invest in Swedish bioenergy via its subsidiary National Bioenergy. In conjunction with World Bioenergy 2006 in Jönköping three agreements were signed – cooperation agreements and letters of intent – between National Bioenergy and Swedish players in the bioenergy field. The collaboration was facilitated by Svebio.

One cooperation agreement concerns the staffing and operation of power plants, and the Swedish partner is Ena Kraft in Enköping. Another agreement concerns the production of forest fuels, and the partner here is Sveaskog. The largest project is a bioenergy complex in Härjedalen, Sweden, where the aim is to produce both electricity and heating in a heating plant combined with pellets production and ethanol manufacture.

At the same time as China is investing in Sweden, Swedish bioenergy companies will help to develop bioenergy in China.

"This is a win-win situation, but Sweden wins the most," said Mr Liu Zhen Ya at the press conference that followed the signing of the agreements. Mr Liu is president of the State Grid Corporation and in practice is China's highest ranking politician in the energy field. He was one of the opening speakers at the recent World Bioenergy 2006 in Jönköping. The conference was attended by about 1,100 participants from about 60 countries.

Arlanda's green approach to landings

Stockholm-Arlanda airport has become the world's first to introduce green approaches to reduce the noise, emissions and fuel consumption of incoming aircraft.

The computerized system involves air traffic controllers in Stockholm using a data link to tell the aircraft's flight management computer what approach path should be used. The aircraft's flight management computer then calculates an exact arrival time based on current flying conditions and sends this to air traffic control, which automatically inserts it in the list of upcoming arrivals.

If two or more arrivals coincide, an additional message is sent to the aircraft, stating an adjusted time. This allows the aircraft to slow down while still en route rather than having to circle above the airport. LFV, the government agency that operates Stockholm-Arlanda airport, said the new system was more detailed and specific than the usual procedure of exchanging information between air traffic control and the pilot via radio.

"This is economically beneficial to the airlines. The technical system behind the green approach also provides a more exact estimated time of arrival, which can simplify ground handling services," LFV said.

The flight management computer also calculates the exact time when the aircraft's approach to Arlanda should begin. This enables the aircraft essentially to "coast" down to the runway, thereby reducing exhaust and noise. The system is initially being used during off-



peak hours and for aircraft able to handle the technology. In the future, it is hoped to extend it to virtually all flights arriving at Arlanda. The project is a partnership between LFV and the airline SAS, and is part-financed by the European Union.

Innovation in Energy Valley

• Located in the heavily-forested heart of Sweden, the engineers of Energidalen (Energy Valley) are at work on the bioenergy solutions of tomorrow. It is to here that companies elsewhere in Europe turn to draw on Sweden's long experience in the field of renewable energy.

Energidalen, which also works in the local and national markets, focuses on the development of innovative products and services, including combustion and utilisation of biofuels, production of solid and liquid biofuels, logistic and integrated energy solutions, tests and development of prototypes and products, as well as education and training.

Managing director Tord Fjällström says the non-profit company's two main objectives are developing new technologies to generate new

enterprises and new jobs in the region, and increasing the competitiveness of bioenergy in order to strengthen the labour market.

"We are spreading Swedish know-how within an area that is well developed in Sweden, but not so elsewhere," he says. "It is quite basic for us, but for new countries it can be difficult to understand. They perhaps stick with fossil fuels instead because they know them."

Fjällström says Sweden has learned through years of trial and error and can now help companies from other nations avoid the pitfalls encountered on the road to a more sustainable energy system.

Based in Sollefteå, Energidalen's practical and technical resources consist of a boiler house with eight experimental stations, and workshop and laboratory environments which provide extensive possibilities for testing and sampling.

Its staff includes 15 engineers specialised in combustion and combustion chambers.

Energidalen's two main areas of operation are developing new products, and involvement in international programmes. These programmes include the ESCOBALT project, which is concerned with technology transfer to the Baltic states and eastern Europe. It is focused on adopting common strategies and action plans based on the Corporate Social Responsibility Concept (CSRC), and to promote rational use of energy as a base of CSRC. Another is LAM-NET, involved with small-scale bioenergy technology transfer to the global sector.

Energidalen is also a leading player in the Brussels-based European Biomass Industry Association (EUBIA), of which Fjällström is president, which works with technology transfer between industries. EUBIA groups together market forces, technology providers, and knowledge centres, all of them active in the field of biomass.

Developing ideas

When it comes to the development of new technologies, Energidalen develops ideas brought in by inventors or companies from Sweden and abroad, and then pass the finished product on for others to commercialise. Sometimes the organisation establishes a company and starts out as a smaller shareholder, and then brings in other companies to take over.

"We set up a group of the steering committee and try to find investment money, depending on which stage the idea is at," says Fjällström. "It can take five to eight years from idea to reality and that is part of my work, to shorten this time. That is why they come to companies like us. If you are alone you can wait too long and other products can get ahead of you."

There can be anything from three to ten projects under way at any one time in Energidalen's workshops. The company also works with education and training, and is currently running a programme for plumbers and electricians from Ireland on the installation of pellet burners in that country, where biofuels are a relatively new technology.

"We believe that Sweden and the Nordic countries are leading the biofuels sector and hopefully our technology also will be useful for other European countries," says Fjällström. "I think we have a very good reputation in the biofuel field and we need to use it more for business purposes."



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Exporting the green streets of Göteborg

• Göteborg has more biogas and natural gas-powered vehicles than any other city in the world, and is now exporting its know-how around the globe.

Delegations from the likes of France, the US and the UK have visited western Sweden to watch and learn how the city has managed to bring together the various players in the biogas chain to create a practical and environmentally-friendly alternative to petrol and diesel.

A driving force behind Göteborg and the surrounding region's increase in the use of biogas has been the Biogas West cluster. This project aims to stimulate the production and distribution of biogas and to promote the market for biogas-powered vehicles. It brings together biogas producers and distributors and vehicle manufacturers.

The west of Sweden is the heart of the nation's automotive industry, and among Biogas West's members are Volvo Car Corporation and Volvo AB, to which Volvo Trucks and Volvo Buses belong. Volvo Cars is one of the leading exponents of alternative fuels, and offers several of its models in Bi-Fuel variants, running on biogas and petrol. The main thrust of short-term and medium-term development at Volvo Cars today is on methane and biogas, ethanol and hybrid technology. Volvo Buses is one of Europe's leading manufacturers of gas buses, and recently launched a new engine which already meets the Euro 5 emissions standard years ahead of its introduction.

A new industry

Biogas West project manager Bernt Svensén says the aim is to promote the use of biogas-fuelled vehicles, to encourage the production of biogas, and to create the infrastructure to make it available to drivers. "You could say that we want to build a new industry," he says. "We have a very clear target and vision."

Between 1995 and 2005, the number of natural gas and biogas-fuelled vehicles in the city and its surroundings grew from zero to more than 4,500 cars and more than 200 heavy vehicles. In 2005 alone the figure grew by 50

per cent. That equates to 14m fewer litres of petrol used and 17,000 fewer tons of carbon dioxide released into the atmosphere each year.

The target for this year is to have 7,000 gas-powered vehicles, and 35 filling stations to service them. "The vision for 2020 is that this alternative will have a market share of about 20, 25 or even 30 per cent," says Svensén.

Biogas West has been encouraging Göteborg's city authority to switch to biogas for its large fleet of vehicles. "The City of Göteborg initially set themselves the target of making 50 per cent of their vehicles environmentally friendly by 2005," says Svensén. "Now they have raised this target to 90 per cent by 2009." The project has also been in discussions with private sector employers to promote the use of biogas in their fleets.

The fuel itself is made at the seven – soon to be eight – biogas plants in the Göteborg area and the west of Sweden. The raw material can be anything from sludge from sewage plants, to household or catering industry waste, to agricultural crops or waste, which are broken down to create methane.

Besides the environmental benefits – such as zero emissions of CO₂ and very low emissions of NO_x and hydrocarbons – there are also strong economic reasons for drivers to switch.

Svensén says that on top of the fact that the fuel itself is cheaper than petrol or diesel, drivers in many Swedish cities can park for free and in Stockholm are exempt from the new congestion charge. Plus company car drivers pay a reduced level of tax if they use the vehicle for personal use.

Follow the leader

Now Göteborg wants to spread the word globally, and in doing so benefit from the business opportunities that wider use of biogas could bring. Biogas Cities is a collaboration between Biogas West and the Volvo companies which invites cities and regions from around the world to learn from Göteborg's example.

"We are working together with Business Region Göteborg, both Volvo companies and Region Västra Götaland, and we decided we wanted to let other cities know about this con-



Göteborg leads the world in the use of 'green' vehicles

cept, how we have worked together to create this infrastructure with biogas plants and filling stations," says Svensén. "We have always had visits from other cities and other countries, but we are now doing this in a more organised way. We think if we can sell this concept we can export both knowledge and vehicles in the future." Among the recent visitors was a delegation from Paris in March, where they are considering using biogas from sewage plants to run buses in

the city. There has also been a visit to California where a delegation from Göteborg met with Governor Arnold Schwarzenegger's environment minister, and a return visit is planned for June.

Svensén admits that biogas cannot on its own solve the problems of rocking petrol prices and finite resources. "It cannot replace all diesel and all petrol, but it is one alternative that combined with others could be very interesting for the future."

Emission possible

• There are an estimated 700m vehicles on the world's roads, and the global automotive industry continues to churn out around 58m more per year. The vast majority of these run on fossil-based fuels which are a major cause of global warming, and for which demand is expected to soon outstrip production capacity.

There are many alternative fuels available or under development, but none which has yet proven to be the "silver bullet" solution to the world's addiction to oil. In an effort to minimise the environmental and human health damage caused by fossil fuels, a company based near Stockholm is spreading Swedish experience and know-how in reducing vehicle emissions to countries ranging from the US to Iran and Chile.

"AVL is absolutely focused helping the automotive industry in developing better engines and to comply with these challenges for the future," says Peter Gillbrand, AVL MTC's managing director. "But added to that, a part of our Swedish team has for 15 years been wor-

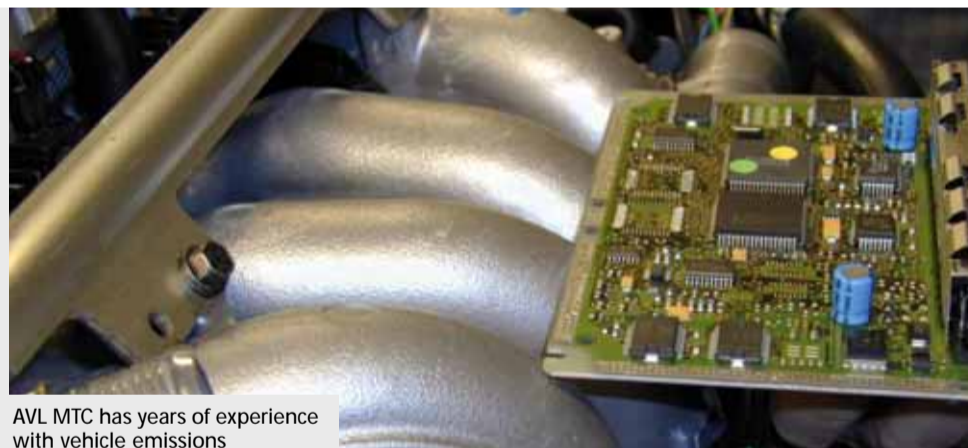
king with local and national public bodies around the world to help them to understand what is going on, identify action plans and work to improve the ambient air quality by implementing measures that improve the transportation work. That could be, for example, to investigate what it would mean for a city like Lima to go from diesel-fuelled buses to compressed natural gas-fuelled buses."

The company was formed when AVL, one of the world's leading engine developers with a turnover of €500m, acquired Motor Test Centre (MTC), a company originally set up by the Swedish government to be a national competence centre for vehicle emissions. "We have been working with emission-related research programmes and fact-finding projects for about 30 years, and this brought AVL some additional capacity and competence," says Gillbrand.

Working globally

AVL MTC now works around the globe helping its customers – who can be anything from governments to research foundations to industry – reduce emissions from traffic and in doing so improve the ambient air quality. The company develops strategies, acts as project manager and provides training, and is able to draw on its long experience to work within areas such as vehicle standards, inspection and maintenance programmes, emission factors, system for retrofit, public transport, fuels and health effects. Funding for its projects comes from the likes of the World Bank Group and the Swedish International Development Cooperation Agency (SIDA).

Lennart Erlandsson, the business area manager for air quality and emission research, says: "We have been working in the international arena



AVL MTC has years of experience with vehicle emissions

for about 20 years in various countries in Asia, Latin America, the Middle East and in Africa. We have changed focus over that time, but the majority of the work has been on establishing the baseline for emission inventory. Then we have also proposed how to proceed, and the established the consequences of going this way."

The company's biggest project to date was carried out in Teheran, which held the dubious honour of having the poorest air quality in the world. "From 1994-97 we developed a city action plan detailing about 60 different measures for the city to select to deal with this problem," says Erlandsson. "We estimated the future ambient air quality if all the measures were to be implemented, together with time-frames and costs."

Since 1997, AVL MTC has continued its involvement in Iran and is now working there on the implementation of compressed natural gas (CNG) buses, which are fuelled by domestically produced gas and produce a fraction of the emissions of petrol and diesel.

California calling

Another CNG project with which the company was involved took place in New Delhi, where a switch to CNG in the city's public bus fleet

led to a spate of accidents where buses caught fire. AVL MTC came up with proposals on how to improve the overall safety of the buses.

In Vietnam, the company has been working on the phasing out of leaded gasoline. "Working together with a US consultant, we came up with a proposal to come up with a quick changeover from leaded to unleaded fuels," says Erlandsson.

Public authorities in California have also turned to AVL MTC on the issue of the retrofitting of tens of thousands of heavy-duty vehicles. "Since we have 15 years of experience in introducing particle filters on heavy duty vehicles, we have been asked by the California Air Resources Board to transfer technology and know-how from Sweden to California," says Gillbrand.

Gillbrand says that in order to handle both emissions and to handle the oil situation in the future, global cooperation is key. "The spreading of best practice will be a very important success factor for the future. We have been trying to spread best practice when it comes to emissions for about 15 years, and we will continue to do that. And we also do our best to spread best practice when it comes to alternative fuels and their implementation."







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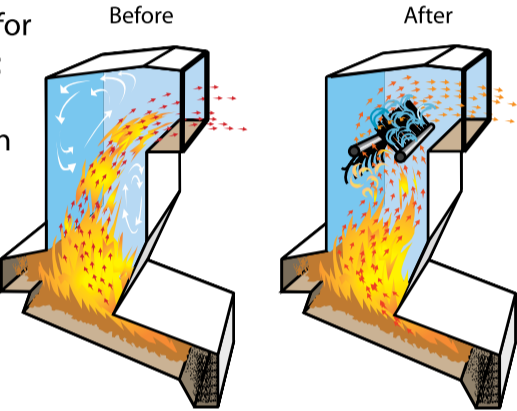
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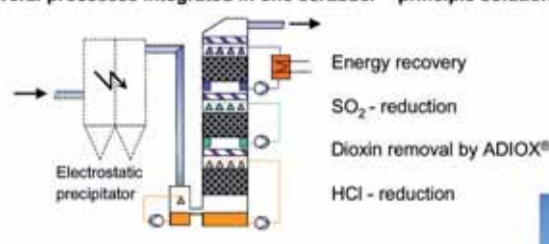
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Bio-treatment for waste water brings global success

• The combination of Swedish microbiological know-how and Norwegian leading-edge technology has created an innovative concept for treating waste water which is generating business around the world.

AnoxKaldnes - formed in 2002 by the merger of Swedish firm Anox and Norwegian Kaldnes - has installations of its MBBR technology in 48 countries and saw its business grow by 70 per cent last year. Today its customers include municipal waste treatment facilities in the US and pharmaceutical giant AstraZeneca in the UK and Sweden.

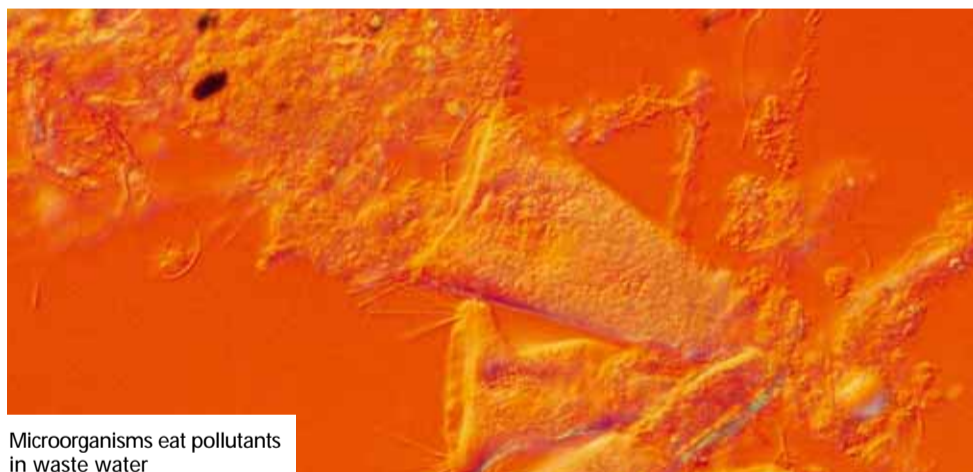
"The knowledge about microbiology and how to create novel solutions that we had in Sweden, in combination with this interesting technology and process know-how from Norway, made a very good fit," says Thomas Welander, CEO of AnoxKaldnes Global. "We see the result today is great interest from all over the world in what we are doing. But it is not

to the surface of the plastic. "It is a simple principle, but the secret is how you design the processes to make the best use of microbiology, as for example how many steps you have in series and what conditions you apply," says Welander. "We find different solutions to different problems all the time."

Custom-made solutions

Most of the applications of the MBBR technology are custom-made by AnoxKaldnes according to the customer's needs. "We have this technology on which we can base our solutions, but then we have to look at the situation - what kind of waste water, what compounds there are, what problems there could be - and then we design a process," says Welander.

The solution can be in multiple stages with different specialised microorganisms in each stage, can be used as a pretreatment prior to another biological treatment, or as a post treatment. "We always find the best way because



Microorganisms eat pollutants in waste water

the technology that is the solution - it is how we use it in different ways to solve problems. It can be upgrading huge municipal treatment plants, or treating toxic industrial waste water. It can differ from case to case but we use MBBR as the core technology in our solutions."

MBBR (moving bed biofilms reactor) was invented at the Norwegian University of Science and Technology in Trondheim. "It is what we call a biofilm technology, which means that microorganisms grow as a film, a layer on surfaces," says Welander. "They attach to plastic surfaces, and what we have done is developed plastic pieces we call carriers that are maybe a few centimeters in size with a large surface area for the microorganisms to grow on. These carriers are used in the treatment plant which can be seen as a tank which we aerate with an aeration system to provide the oxygen needed by the microorganisms, and at the same time this air mixes the contents."

The tanks is half filled with the plastic carriers, which move around continuously because of the air in the tank, and the microorganisms that eat the pollutants in the waste water attach

we have the know-how about the microbiology," he says.

Business has grown briskly since the merger, and last year AnoxKaldnes reached a turnover of €26.6m. Today it has its headquarters in Lund, Sweden, subsidiaries in Norway and the US, a joint venture in Spain and another in Australia, as well as offices in China and Russia. In the other counties in which it has a presence, AnoxKaldnes works with partners and networks.

Welander says the next step for the company will be to put the byproducts of its waste water treatment work to good use. "We see a huge potential for our treatment technologies to be further developed, but we also have an R&D project where we are aiming to change waste water treatment quite fundamentally by having the microorganisms produce the raw material for bioplastic production," he says. "Maybe half of what today is considered waste will be a valuable raw material we can extract and use for making plastic. We hope that in about five years' time we will have treatment plant production facilities for bioplastics. That is our future potential."

Pay as you throw

• Linking an identification code number to each load of garbage that's thrown into trash disposal chutes, a system developed by Envac Centralsug allows cities or landlords to charge tenants for the individual amounts that each discards.

Access cards to disposal channel inlets that record volumes thrown away by registered users are the latest accessory for Envac's automated underground channel network systems for transportation of municipal and commercial solid waste.

"The first sites with access user cards have are presently working in the Netherlands and Spain, and their performance appears to be quite commendable," says Jonas Törnblom, director corporate marketing and communication. "Commercial establishments appreciate that they don't need to keep waste on their premises. This also alleviates stipulations placed upon them for handling trash. Invoicing by the authorities to users has also worked without problems."

Uninterrupted performance

Headquartered in Stockholm with 30 offices in 16 countries, the corporation with more than forty years of experience engineers, installs and maintains its vacuum-driven trash removal networks around the world and accommodates customers that vary in size from 100-unit high rises to entire cities. In 1961, their first installation went into action at Sollefteå hospital in Sweden. Like all of some 500 more sites since then, once it went on-line, there's never been a shutdown caused by dissatisfaction with performance or operations.

"Cities that have installed Envac systems cannot imagine going back to conventional garbage handling. It would be like eliminating toilets in favour of outhouses in the back of big buildings... it's completely unthinkable," says Törnblom.

Fully automated, safe and environmentally advantageous, an Envac system leads to enhanced occupational health and safety standards, enables higher building density, reduces demand for

reinforced streets, improves hygiene and comfort for tenants as well as users and results in a drastic reduction in on-road transportation of waste.

Because Envac is a fully enclosed vacuum system, it eliminates foul-smelling, dirty refuse-collection rooms and steel containers or cans in the streets. Simply described, the system consists of a number of collection points, linked together by piping that transports the waste to a central collection station. When the containers are full, after compacting, conventional trucks remove them to incineration facilities, composting plants or landfills.

Excellent prospects

"The majority of all new installations have solutions for multiple waste fractions," says Törnblom. "We often handle non-recyclables, recyclables and organic waste in one and the same system."

Another recent Envac innovation specifically addresses street-level trash: its public litter bins are placed along heavily-trafficked areas

where much waste is generated. These also connect to automated underground collection networks. Törnblom says that many cities around the world are interested in this feature, which is already being utilised in the Netherlands.

"We are also pioneers with our commercial vacuum systems that remove leftovers from meal trays. The greatest use of these so far has been found in the in-flight catering food service areas at larger airports. We have completed a large installation at the airport in Dubai. This handles all the catering activities for the airport. Our smallest system, Nanovac, can be used efficiently in a restaurant with as few as 50 seats. School cafeterias, hospitals and the like are excellent prospects for this tray system."

Tailor-made turnkey systems

Many projects are connected to Envac's computerised remote control system. Envac constantly tests new solutions and technology, although each Envac system is unique and customised. "We also conduct entire project-planning process, with cost calculation, simulation of processes, preparation of engineering drawings, etc.," says Törnblom.

Among some 400 European installations, a newly-contracted system in Narbonne, in southern France, will eventually expand city-wide. Törnblom says Envac also expect orders from building projects consisting of mixed urban developments in London. With 40 beach-front highrise towers, the largest single stage construction project in the world is underway at Palm Island's Jumeirah Beach Residences in the United Arab Republic, and other projects are underway in Dubai.

Currently Envac is very busy in China. The country's apprehensions over communicable diseases have spurred interest in the technology. "The reasons to improve urban waste handling may differ from country to country, but it is an important issue everywhere," says Törnblom.



Envac's network of underground rubbish chutes

Sustainability praised to the skies

• Despite a tough period of costcutting, SAS has continued to take major strides in fostering the group's sustainability development.

"The code of conduct introduced by the board, giving clear guidelines about corporate responsibilities, now involves every single SAS employee," says environmental director Niels Eirik Nertun.

Having won prestigious awards for the group's environmental and sustainability reports in Sweden and Denmark last year – the most recent being the Norwegian Best-In-Class Nominee in March this year – there is a growing realisation that economy and the environment go hand in hand, and that one is impossible without the other. "We have talked about this for years, and at long last our sustainability policy is being taken seriously. Evidence of this is the fact that major SAS investors are now eager to discuss environmental and social responsibility as well as our aircraft fleet development when viewing how we perform, and how we can reduce risks in our operations," says Nertun.

Eco-efficiency index

A few years back, SAS devised ten sustainability principles (the same as the UN Global Compact) as well as a score table and eco-efficiency index so that each SAS company could measure its progress in comparison to others within the group. "We see a very positive development in all our eco-efficiency indexes," says Nertun. "Our Scandinavian airline companies are actually one point ahead of our goal with our Finnish Blue 1 airline maintaining the best index development."

When it comes to sustainability in its hotel

business, Nertun says that SAS's 250 hotels constitute the fastest growing enterprise within the Group. "Some of these hotels are located in countries listed by the UN for breaking human rights so they have to be particularly careful with how they act when complying with local society regulations, and how they can contribute positively to regional sustainable development."

The emission calculator is a tool that estimates a passenger's share of emissions that was introduced in 2002. According to Nertun this is now firmly in place and SAS reached its goal

SAS takes environmental responsibilities seriously



of extending it to the entire group and its route net in March of this year. "It is evident that the public as well as companies are becoming more and more aware about the environmental impact of air travel," he adds.

In general, emission trading remains a hot topic for the aviation industry. "We are presently working intensively to create a good workable system by lobbying the EU Commission which has now formed a special working group to develop the system," says Nertun. "The goal is to have emission trading in place by 2008.

In the meantime, the International Civil Aviation Organisation, the UN organ for civil aviation, has specifically urged member countries not to introduce measures of their own before a proposal is published at the end of this year. This is why we are surprised that Sweden is contradicting by proposing its own airline tax on passengers to come into force before the proposed directive is made public."

SAS supports the principle of emission trading as the best way to reduce carbon dioxide discharge and enhance cost efficiency.

Demanding European goals

Nertun says that the way to make an airline company most efficient is to continuously renew its fleet with the best available technology. "Under the influence of the costcutting programme we are still discussing how a renewal programme can develop. There are demanding European goals for our industry by 2020 stating that fuel consumption and noise must be reduced by 50 per cent and nitrogen oxide by 80 per cent. However, we are optimistic that we can reach these stringent goals as evidence shows that aircraft are improving all the time."

Nertun says that SAS must continue with its cost-saving programme in order to remain competitive and to be more efficient. "The recent rise in fuel prices has put enormous pressure on aviation and triggered us to launch a huge fuel saving programme. During this last year we have already been able to reduce consumption by between 50,000 and 100,000 tons of fuel. I suspect that prices will remain at the present level. This is why we are also carefully following the ongoing intensive research into the use of bio-fuels and how these can be put to commercial use."

JEREMY HANSON

Spearheading underwater cleaning

• "Regardless of whether we are dealing with basins in water works, wastewater treatment plants or commercial swimming pools, these have to be cleaned regularly. The ability to clean these without actually emptying the water is a challenge we at Weda are accustomed to and have successfully resolved," says Klas Lange, Weda's managing director and part owner.

Weda AB is an industrial enterprise that offers solutions for cleaning underwater surfaces. Water works, wastewater treatment plants, industry and commercial swimming pools rank among the company's customers. "Today, our business is divided into three main areas," says Lange. "One designs, builds and sells pool cleaners for commercial swimming facilities with high demands on performance and reliability. The second designs and develops underwater cleaning equipment for water works and wastewater treatment plants while the third develops and markets Weda's VR-600 system for cleaning water towers and reservoirs."

Until the end of 2005, Weda was owned by the Eletta Group but in the beginning of 2006 it was bought by four industrialists, including Lange. The head office is located in Södertälje just south of Stockholm where it has been since the start in 1919. Today, Weda has its own marketing organisations in Germany, France and the US as well as agents and distributors all over the world.

Olympic pool cleaning

Lange explains that after 30 years as the market's leading supplier of automatic pool cleaners, Weda equipment is being used at some of the leading commercial swimming pools in the world. "For example, Weda was chosen to handle the pool cleaning during the 2004 Olympic Games in Athens. We were the only company that

could fulfil the strict requirements for quality, reliability and service due to our outstanding products and expertise. This was based on the fact that our equipment could guarantee effective bottom cleaning which, in turn, meant that the amount of chlorine added to the water could be greatly reduced. By using a lot less chlorine, this contributes to a better environment for swimmers, visitors and employees as well as a lower risk of allergic reactions."

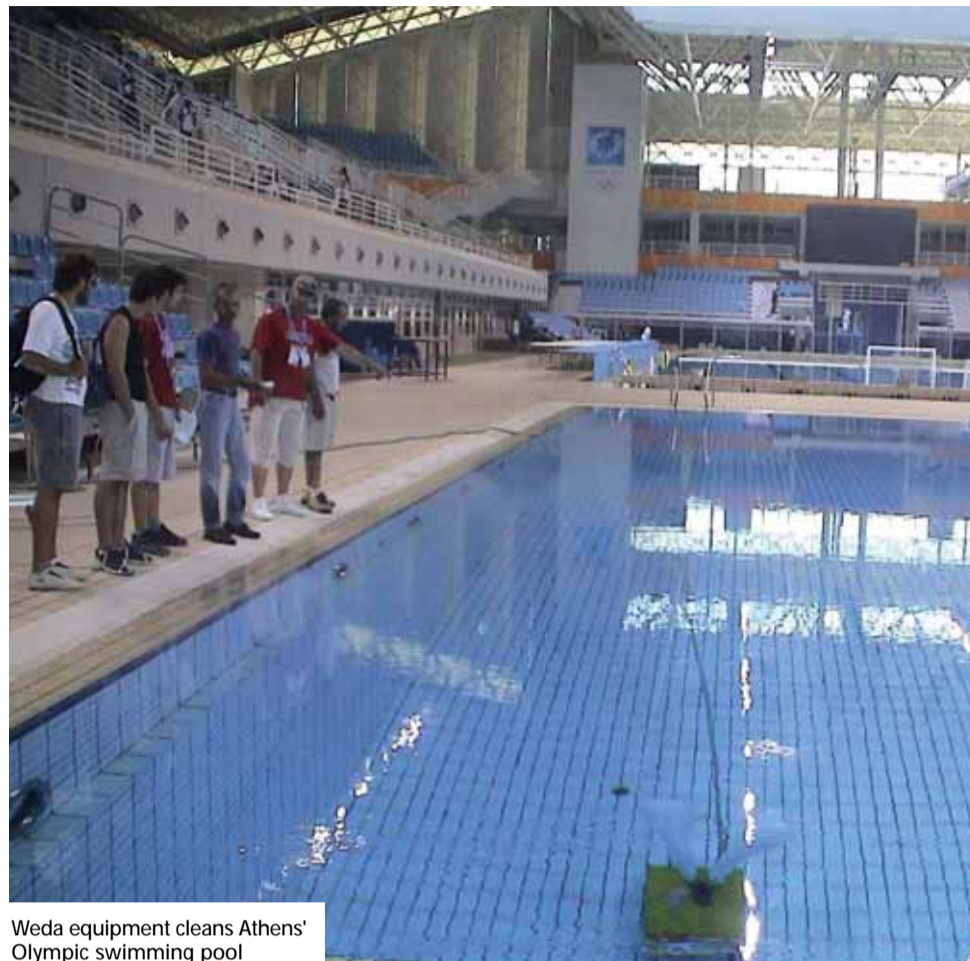
Lange says that in 1996, Weda installed six SD Systems at the Lovö water works outside Stockholm. The SD System was assembled on the basin bottom and operated via microprocessors for cleaning at pre-set intervals. This waterworks has a capacity of 275,000 cubic metres per day and supplies Stockholm with its drinking water. The SD System has also been successfully assembled in other water works around the world such as in Ohio, USA.

Disruptions avoided

Another example is the VR-600 which is used to clean water towers and reservoirs around the world such as in Sydney and Hong Kong. "These two cities suffer from constant water shortage and, therefore, have to be restrictive with their resources. By using the VR-600 to clean water towers and reservoirs, costly disruptions are avoided and waste water is kept at a minimum."

Other installations include Weda's CS-600 which is used in wastewater plants around the world such as in Australia, for example, it is used in a polishing pond, being the final basin, before the water is reintroduced to nature. Another is Weda's YT-800 being used in slow-filter water works in Sweden as well as in Spain where the technology is used to clean huge catch ponds for rainwater.

Lange underlines their ambition not only to maintain but to improve and extend their under-



Weda equipment cleans Athens' Olympic swimming pool

water cleaning technology. "We are now moving into new areas such as the nuclear power industry, glass making factories and producers of beverages all of which are dependent on reliable water supplies. We are also looking at sewage treatment which can benefit from our technology. In general, there is an ever-increasing demand

for water products at the same time as there are warning signals indicating that we are running out of water. In order to safeguard our drinking water supplies, we must clean water by efficient mechanical means and without the use of chemicals. This is our philosophy at Weda."

J E H

Reliable

Effective

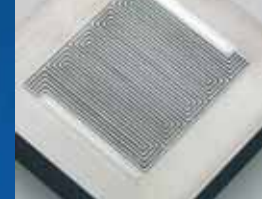
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Hydroelectric power



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Eco-Tech focuses on business

• More than 100 exhibitors, eight major seminars and conferences plus newly-added business matchmaking will attract thousands of professionals to the 10th biannual Eco-Tech Scandinavia 2006 environmental technology trade show in Göteborg.

Already growing faster than any other field, the huge environmental technology sector promises tremendous expansion. The EU estimates that the new member countries will be obliged to spend around €50-€80bn to comply with its environmental standards. Even better, the worldwide eco-tech export market is expected to multiply into an annual worth of some €640bn by 2010.

Based on these facts, in order to accommodate business and industry from start-ups to established companies as well as government authorities, municipalities and non-government organisations, Eco-Tech Scandinavia 2006, which takes place from November 21-23 at the Swedish Exhibition Center, has been revamped and given a more distinct business profile and setup.

Big change

"Eco-Tech Scandinavia 2006 is more focused on business than ever before. Our market research concluded that an environmental trade fair should focus on sustainable business. For this reason, Eco-Tech Scandinavia is taking an approach that's accentuated toward business and commerce. That's quite a big change," says Ann Åfeldt, the Swedish Exhibition Center's exhibition manager for the event.

The overall theme for the Eco-Tech Scandinavia 2006 conference will be Sustainable Innovations. With experience as expert consultants in environmental areas, Natliken Sustainability has been selected to arrange conferences, and the World Business Council for Sustainable Development, a European organisation, is also assisting.

"We are pleased to welcome Leif Johansson, President, Volvo group, as our conference keynote speaker," says Åfeldt. "The conference, running during the first two days of Eco-Tech Scandinavia 2006, will present larger seminars with more readily recognised speakers. This will attract more delegates to each. Instead of more than 20 seminars and conferences, the total has been condensed to two major ones each morning and three in the afternoons."



The show has been revamped to give it a more distinct business profile

The conference programme contains the most timely and pertinent subjects along with environmental updates and innovations. The exhibition has been separated into six major sections: Waste and Recycling, Energy, Transport, Environmental Competence and Air, Soil and Water, and the "Biogas Highway", illustrating the entire biogas chain. Seminars reflect the themes of these different sectors.

Conference topics

According to Åfeldt, surveys reported that 48 per cent of visitors at Eco-Tech 2004 were interested in products within the section of waste and recycling. Energy is another section that is considered from an environmental technology perspective. Energy and environment efficient solutions are topics of the Transport and Vehicles area. Current strategic issues in the Environmental Competence area will consider how companies can profit from their milieu work. In the Air, Soil & Water area, delegates will concentrate on clean air, land and water climate problems, global warming, the emissions trading system and global pollution issues.

For the first time, matchmaking at Eco-Tech Scandinavia 2006 is offering business interest

pairings and appointments during the exhibition, and on its premises, as a free-of-charge service. This service is provided by a group of Innovation Relay Centres (IRC) and Euro Info Centres (EIC) for the purpose of creating technical collaboration and generating new business among companies in different countries.

Sales opportunities

"Interest in attending is swelling due to the outstanding reputation that Sweden has amassed in the environmental technology field, which is evident with the nation's products, expertise and know-how," says Åfeldt. "This is a brilliant opportunity for Swedish environmental companies to demonstrate their products and come into contact with purchasers from both the European and international markets."

As has been done in previous years, Eco-Tech Scandinavia 2006 will once again be held concurrently with Process Technology 2006, Scandinavia's leading process industry fair, which this year has the main theme of Online Measurement.

"The fact that the exhibitions run parallel causes an increase in worth for visitors because the events slice through each other's areas of



Ann Åfeldt

technology. Thanks to this, visitors will obtain a greater overview of mutually shared techniques and competence within the various areas," says Åfeldt.

4,000 visitors are expected, and inquiries are arriving from as far away as Asia. Besides other Scandinavian and European companies adding to the 125 exhibitors at Eco-Tech Scandinavia 2006, around 200 exhibitors will appear at Process Technology 2006, which expects 6,000 visitors.

New system simplifies drainage repairs

• During the last ten years, more and more property owners have taken advantage of a new, revolutionary system for repairing existing drainage and water pipes in high-rise blocks of flats, office properties and private homes.

"Our patented Proline method entails moulding new and extremely durable plastic pipes using the old pipes as forms. This saves all the inconvenience as well as vastly reduces the costs involved when repairing pipes in existing buildings," says Sten Edström, founder of Proline AB.

The Proline method has already been successfully used when repairing drainage and water pipes in around 20,000 homes and office properties throughout Sweden. Edström originally came up with the idea behind this method back in 1989. It was then first patented in 1996 after which time Proline AB started its rapid expansion. "Today the company has 120 employees and an annual turnover in the region of €15 million," says Edström. "Presently we are moving our headquarters from Gävle to Stockholm, and a new managing director has just been appointed to relieve me of some of my duties. We are already established in the major Swedish cities of Karlstad, Lund, Jönköping, Linköping, Örnskoldsvik, Örebro and Göteborg."



Sten Edström

The method

When explaining the method, Edström says that, instead of ripping out the old pipes, which can cause a lot of mess and damage, they begin by cleaning the insides of the existing pipes mechanically using high pressure and rotating machines. "This is a process which takes about two hours. The pipes are then dried before three separate layers of durable plastic are moulded

into them with the help of special pressure pumps and allowed to dry for about an hour between each layer being applied. While the work is in progress, it is filmed using a video camera to keep a check on the extent of damage in the old pipes and to make sure these are thoroughly moulded with the plastic layers. The whole operation is completed in very short time and with a minimum of interruption. This means that those living in the building do not need to move out at all while the work is in progress. Furthermore, the Proline method only costs a fraction of what it would cost to remove and refit new pipes. Added to this, the property owner is provided with a DVD film so that he or she can see exactly what the inside of the pipes look like after the process has been completed."

Talking about Proline's markets, Edström says they are presently consolidating their position in the Nordic countries. "Moreover, there is a growing interest in our method in several Northern European countries such as Germany, and inquiries are also coming in from southern Europe."

Bright future

Asked to comment on the future of Proline AB, Edström says that their intention is to further strengthen their position within the Nordic

countries together with continental Europe in general. "Our aim is that, within the next five years, to be established in the USA as well as throughout Eastern Europe. Our objective is to develop joint ventures or to work on a licensee basis in these countries. Everything points to a bright future. Wherever there are drainage and water pipes in buildings that need to be repaired, there is a market for our method."

J E H

The Proline method is cheaper and quicker



Electrolux seeks healthy eating habits

For the fourth year in a row, Electrolux is encouraging students around the world to fire up their creative minds and design household appliances for the future. In the 2006 edition of the design competition, Electrolux Design Lab, students will develop solutions for food preservation and preparation that promote healthy eating habits in 2016. The competition is open to all design students worldwide via the Internet, www.electrolux.com/designlab. Last year's Electrolux Design Lab competition attracted over 3,000 students from 88 countries. An international jury will judge the entries based on their design, innovation, consumer insight and ability to promote healthy eating habits.

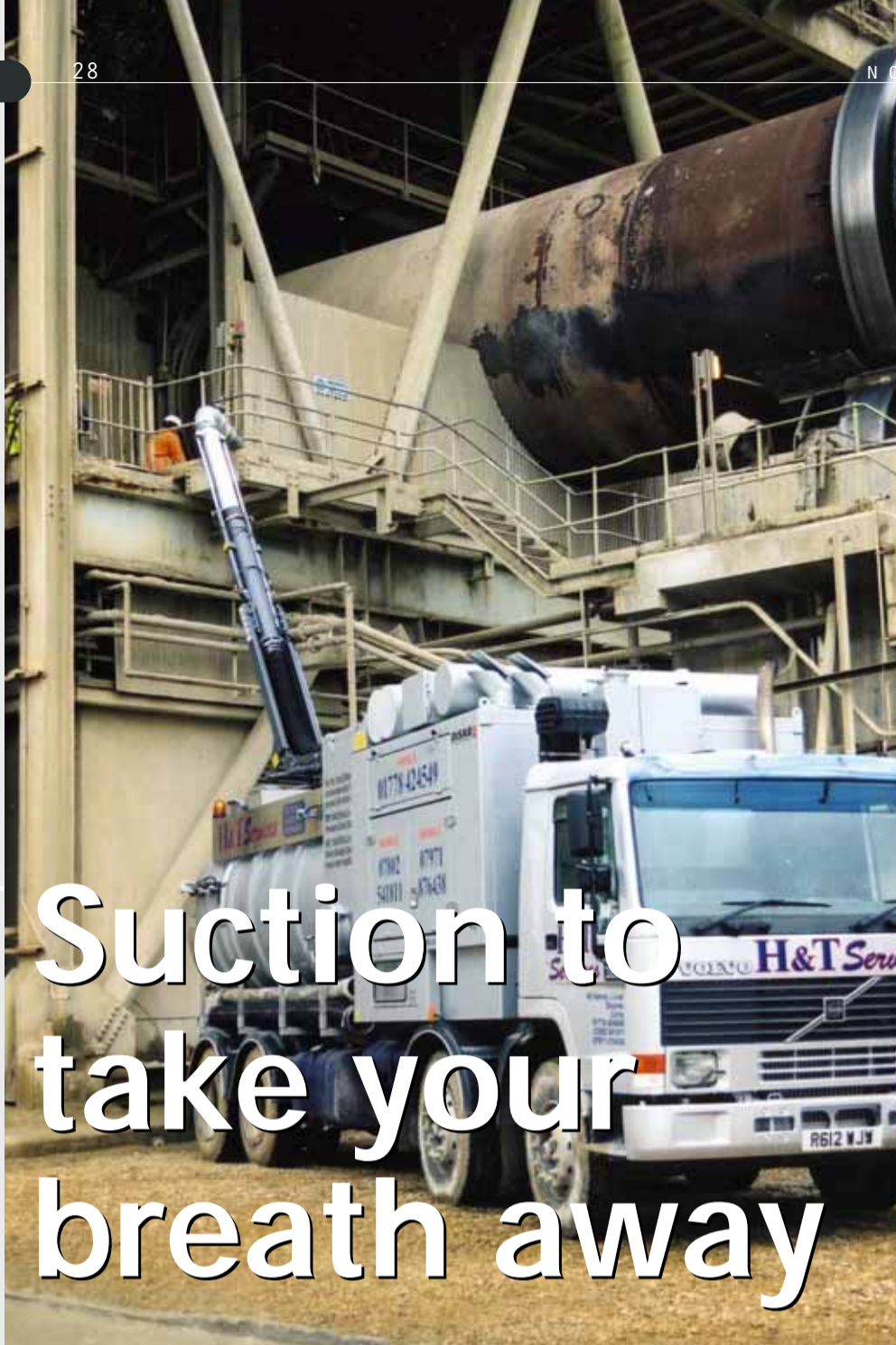
The nine best entries will be invited to Barcelona, Spain, for a final event in late November this year, where the winner of Electrolux Design Lab 2006 will be announced. Last year's Award went to Airwash, a waterless washing unit that uses negative ions, compressed air and deodorants to clean clothes, and features an intuitive, ecological, beautiful design.

Stora Enso inaugurates new paper machine

Stora Enso's new paper machine at Kvarnsveden Mill in Sweden, which produces high-quality super-calendered magazine paper (SC paper), was officially inaugurated on April 28. Paper machine 12 started up in the beginning of November 2005 and is well on its starting curve, currently producing more than 900 tonnes of SC paper per day. The machine's annual production capacity is 420 000 tonnes of paper produced from fresh fibre (spruce pulpwood). The investment is expected to strengthen Stora Enso's position in the growing SC magazine paper market. The latest technology incorporated in the new machine enables the mill to enter new end-use areas and markets that have been traditionally dominated by coated grades (e.g. LWC). With the new capacity Kvarnsveden Mill will also target overseas markets such as North America, Asia and South America.

The total investment of approximately €450 million is one of the largest industrial investments in Sweden. The investment is part of Stora Enso's Asset Restructuring Programme, which aims to increase the long-term competitiveness of Stora Enso's assets and meet customers' growing quality and volume demands. Uncoated magazine paper is used in periodicals and advertising material, such as inserts and flyers.

Kvarnsveden Mill is located in central Sweden and was founded in 1900. It has four paper machines with an annual production capacity of approximately 1 000 000 tonnes. About 85 per cent of the mill's production is exported, primarily to countries within Europe with the largest customers being in the UK and Germany.



Suction to take your breath away

• "Our business concept is to develop, manufacture and market vacuum systems for the environmentally-friendly collection and transportation of materials that can pass through a sealed hose and pipe system," says Eric Hardegård, managing director of the DISAB Group.

The DISAB group, with its highly-skilled, experienced employees in areas including technical design and construction, is one of the largest industrial vacuum equipment manufacturers in Europe.

"No area, site or industry is an obstacle to our technology as our machines can work in the most inaccessible surroundings and handle virtually all materials that can pass through a hose," says Hardegård. "In close co-operation with our customers, we constantly investigate new applications and areas where vacuum technology could solve problems."

A vacuum unit consists of a vacuum pump, which is powered by an electric motor or a diesel engine, a filter unit that cleans the air that is

used in conveying the material, a material separator to separate the main volume of material from the air stream and a set of flexible suction hoses with a length and diameter suited for manual handling and suited for the air volume of the vacuum unit. An extremely high airflow, of up to 8000 m³/h, moves the material. It is designed to handle both wet and dry materials from municipal facilities, industries, ports and construction sites.

Abundant areas of application

Materials can be sucked by air along distances of 40-50 metres. For example, roof shingle can be replaced using the technology. Once the roof is cleared, the same machine can blast the new shingle up, making the whole process fast and cost-effective. Within the cement industry, mobile vacuum loaders or a stationary vacuum system are primarily used to reduce the downtime of a plant when the normal transport line is broken and an overflow of spillages has occurred. A custom-designed vacuum system can increase the efficiency and reclaim the spilled material

directly back to the process.

DISAB's know-how has also been applied within railway maintenance. "Our DISAB-Railvac unit can, replacing standard machines, be used for 'surgical' excavation within rail road maintenance," says Hardegård. "Repair of wet spots, cabling and drainage work is common. Furthermore, our DISAB Railvac-Unit can be used instead of excavators to remove ballast and earth along railway lines without damaging underground cables."

In order to meet the an ever-increasing range of applications, DISAB's operations stand on three key pillars: Heavy mobile equipment with a high degree of flexibility for contractors serving the needs of industries; fixed installations and semi-mobile vacuum units mainly for use in the process industry manufactured via the company's subsidiary, DISAB TELLA AB; and high-capacity vacuum units specially designed for railway maintenance.

Better work environment

DISAB's industrial vacuum units/systems have numerous advantages within cleaning, transport and recovery. With low noise level and low residual dust in the exhaust air 1,3 mg/m³, DISAB's machines and technology always meet and often surpass current legislation and creates a better internal and external work environment.

"Other areas we work with include the recently imposed EU ATEX legislation concerning explosion risks in the process industry," says Hardegård. "By removing dust using our technology, it is possible to reduce such risks."

A recent million-pound contract involved the DISAB Railvac-Unit for repairing degraded track ballast sites on the Piccadilly Line of the London Underground. "The introduction of our vacuum excavation machine there last September has seen a massive increase in track asset upgrade productivity, and we can certainly expect repeat orders."

Ambitious targets

DISAB's history goes back to 1976 when the first electrical vacuum unit was produced. Today, the company is 70 per cent owned by Accent Equity Partners and the remaining 30 per cent by the two initial founders. The company has 65 employees, and the latest annual turnover was €15m. The head office is based in Eslöv in southern Sweden where the company's assembly and servicing facilities cover an area of 23,500sq m. The wholly-owned subsidiary, DISAB-TELLA AB is situated in Vallentuna just outside Stockholm, and there is a sales company in Germany – DISAB GmbH.

Asked about future prospects for DISAB, Hardegård is confident that they will be able to meet their ambitious 50 per cent growth target over the next three years. "We will expand all three of our key pillars, especially in southern Europe, utilising our heavy mobile equipment. Our fixed installations and semi-mobile vacuum units in eastern Europe will be in demand while our railway maintenance equipment will come to use in central Europe."

"Today vacuum units are the obvious choice in production processes where efficiency, high safety standards and environmental awareness are a priority."

J E H

The SCA Environmental and Social Report 2005 is available in full at www.sca.com

In the SCA Environmental and Social Report 2005 you will find information about:

SCA's opportunities and risks related to environmental issues

SCA's social responsibility and implementation of the code of conduct

SCA's fulfilment of the 2005 environmental and social goals



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Critical challenges:

the Swedish strategy for sustainable development

The members of one generation should not live their lives in a way that prevents their children or future generations from enjoying a decent standard of living. That concept, summed up by the term sustainable development, is today an overall objective of Swedish Government policy, both nationally and internationally. In March 2006, the Government presented an elaboration of the Swedish strategy for sustainable development.

By striking a balance between the long-term social, economic and environmental consequences of all its policy decisions, the government's goal is solidarity and justice in every country, among countries and among generations.

Sustainable development will only be achieved if we can use, create and invest in the resources on which the economy relies. These include natural resources, the buildings and infrastructure constructed by human beings, as well as every woman, man, girl and boy, along with their health, expertise and creativity. Such an approach is based on the fact that a well-functioning economy is the basis of social justice and environmental protection. But the reverse is also true – if something is good for human beings and the environment, it is ultimately good for the economy as well.

The starting point for sustainable development is joint responsibility, and this requires a society characterised by democratic values, respect for human rights and gender equality. All citizens must enjoy equal rights and opportunities. All people and social strata must be in a position to become involved and to feel that they are involved. If that is to happen, the Government, the private sector and civil society must cooperate and interact, and this must happen at both at home abroad.

Besides being idealistic, Sweden's vision is also a pragmatic one. By leading the way for sustainable development, Sweden will also drive renewal, growth and employment at home, as social reforms create economic opportunities, and adaptation to new environmental demands calls for new technologies that create jobs and stimulate development.

Traditional convictions

Sweden dates its international sustainable development efforts back to the 1972 UN Conference on the Human Environment. Since the 1992 UN Conference on Environment and Development (the "Earth Summit"), in Rio de Janeiro, Sweden has continued to strive towards sustainable development at home, while carrying on the work to achieve the global commitments set out at the UN World Summit on Sustainable Development in Johannesburg.

While these international events have been a major source of inspiration, Sweden has also built upon its own traditional conviction that social justice and equality are not only compatible with, but a stimulant for, economic growth. Sweden has also long had an environmental policy, and as the major environmental issues – stewardship of scarce natural resources, climate change and hazardous chemicals among them – have grown more and more pressing, the pursuit of an overall policy to create an ecologically-sound welfare state has become the logical next step.

Sweden's sustainable development effort has also meant institutional changes. Sustainable development was adopted as an overall objective of Government policy in 2003, and the Ministry of Sustainable Development was established in 2005, bringing together environmental, energy and housing policy. The Unit for Sustainable Development, which had been set up in 2003 as part of the Prime Minister's Office to lead and coordinate the work of the Government offices in the area, was incorporated into the new ministry. In early 2005 the Government established the Council for Sustainable Development, which has the task of being a driving force for local and regional efforts.

To chart the progress of the strategy, 12 headline indicators are being used. The indicators are broken down into six areas: health, sustainable consumption and production patterns, economic development, social cohesion, environment and climate, and global development. Six of the trends are positive: average life expectancy, energy efficiency, public debt, economic growth, hazardous substances and global cooperation. Two are negative: relative poverty, and demographic support ratio. And four are neither positive nor negative: violence, investments, employment rate, and greenhouse gas emissions.

Striving for synergies

The Swedish Government is placing an emphasis on four critical challenges in the pursuit of sustainable development. The first is to build sustainable communities. The ultimate goal here is to promote decent living conditions for everyone in the face of demographic changes caused by an ageing population, migration and urbanisation, both nationally and globally. Energy-efficient buildings and environmentally-sound infrastructure and transportation systems are also part of the vision.

The second challenge is to encourage good health on equal terms. This is based on the belief that improved public health is essential for both national economic growth and more stable household finances. Key to this will be to eliminate inequalities in health and mortality across social and economic groups. Thirdly, the demographic challenge must be met as Swedes live longer, healthier lives. Here it is of crucial importance that tax-financed welfare systems continue to work well so as to ensure security and social cohesion as the age and size of the population increases.

The final critical challenge is to encourage sustainable growth, which involves recognising the fact that economic expansion is powered by dynamic markets, a forward-looking welfare policy and a progressive environmental policy. The Government's vision is to eventually obtain all its energy from renewable sources. Sweden has for decades pursued policies to reduce the national dependence on fossil fuels, particularly oil, and this year a special commission has been set up under the stewardship of the Prime Minister to phase out the dependency on oil by 2020.

The new technology and solutions this will require, along with the innovations and environmental

technology developed partly as a result of strict environmental legislation, lay the foundation for economic growth and the creation of new jobs. Swedish exports of environmental technology, including renewable energy, now generate €2.7bn per year – a figure which is growing by about 15 per cent per year. The annual turnover in the environmental sector, which employs about 90,000 people is approximately €26bn.

Each of these challenge is important in its own right, but each is also related to the others. The opportunity for gainful employment is central to all four challenges, given its effect on where people live, their state of health and the prospects for sustainable economic growth. Social cohesion is another basic component in each challenge.

Prerequisites and tools

To realise the visions and goals of sustainable development, what is needed is coordination, effective working methods and proper tools, as well as a learning process that is constantly monitored and evaluated.

The Swedish people must be behind the effort, and so the Government plans to arrange a series of local conferences in 2006-09 with the Council for Sustainable Development and key regional and other organisations. The aim will be to encourage activity aimed at meeting the four critical challenges.

Leadership is also needed, and the state will set an example when it comes to promoting social and environmental awareness. State-owned enterprises must take the long-term economic, social and environmental consequences of their activities into consideration.

A number of environmentally-motivated taxes and fees have been brought in to steer consumption and production toward more sustainable alternatives by including external costs in the price of goods and services. These costs may include, for instance, the negative impact of transport systems on health and the environment. In this way the tax system can be used to promote the more efficient use of our shared resources.

Sweden uses more economic measures than any other country when it comes to the environment, raising nearly €8bn each year through environment-related taxes. A full 98 per cent of this is linked to energy and transport, and indeed carbon dioxide and energy taxation are the cornerstone of Sweden's climate policy.

The scope for green tax shift – swapping certain income from tax raises on activities that harm the environment for tax cuts on other areas, particularly labour – in 2001-10 is €3.2bn, and a tax shift of more than €1.8bn has already been approved. Most of this has involved exchanging higher energy and carbon dioxide taxes in the household and service sectors for greater basic income tax deductions. Taxes on waste, natural sand and gravel, and vehicles have also been raised.

Procurement's potential

Public procurement – at around €43bn a year in Sweden – holds large potential for encouraging a more sustainable society by promoting the development of more sustainable goods and services. The Swedish Government believes the public sector should be firmer in its environmental demands during procurement, and intends to draw up an action plan on the subject this year. The Government is also convinced of the importance of making greater social demands – such as the recruitment of young people and the long-term unemployed who have particular difficulty in finding jobs – during public procurement.

Education is one key to sustainable social development. The education system, including adult education, has a key role to play in instilling in students of all ages the knowledge, ability and desire to work for sustainable development. Cultural activities such as theatre, music, dance, film and museum visits can also transmit knowledge, and this approach can encourage participation and critical thinking about building a sustainable society. Such education is vital if citizens are to make conscious choices as consumers and members of society. New curriculum objectives in sustainable development for upper secondary schools apply from next year, and an amendment to the Higher Education Act earlier this year demands promotion of sustainable development in university education.

Monitoring and evaluation of the progress made in the quest for sustainable development will be required, and the Government will perform a follow-up halfway through the initiative. This will make use of the 12 indicators, as well as reports by the Council on Sustainable Development and county administrative boards concerning opportunities and threats in the sustainable development effort. The Government plans to revise this strategy in 2010 and to submit the present strategy for external review.



Ministry of
Sustainable Development
Sweden

For more information
Swedish Council for Sustainable Development
www.hallbarhetsradet.se
www.sweden.gov.se

Equipment firm passes acid test

• High quality stainless steel and chemical conservation – with material cost savings and environmental benefits – are achieved with equipment from Scanacon.

Of the world's one billion tonnes of steel produced each year, about 2.5 per cent become stainless steel. During the production of stainless steel, the material is worked under conditions of high temperatures and mechanical stress, activities that result in a change of the steel's metallurgical and physical properties. A subsequent procedure of "finishing" is necessary to restore the desirable properties of the steel. Pickling is a term used to describe a particular finishing procedure where the material is treated using concentrated acids.

Precise control over the pickling process is key to ensuring that the stainless steel exhibits the principle advantage it has over other steel grades – its ability to withstand rust. From a manufacturer's perspective, achieving the highest quality stainless product at the lowest cost is the goal that Scanacon equipment allows them to achieve. In addition to lower production costs, manufacturing waste and the cost of treatment and disposal are significantly reduced.

By a wide and growing margin, equipment from Scanacon AB of Stockholm has quickly become the standard for stainless steel producers worldwide. Established in 1982, Scanacon today has offices in Sweden, the United States and Asia.

Knowledgeable and qualified

"Our market advantage is that we are knowledgeable and qualified in the science of pickling. Scanacon equipment optimizes the acid finishing process and increases productivity while simultaneously reducing costs and environmental liabilities," says managing director Magnus Lindberg.

Certified in accordance with ISO 9000:2000 standards, Scanacon is a niche company in the respect that it does not become involved in

recovery of liquids other than acids, and focuses specifically upon the steel industry. "Our entire company concentrates on making equipment for analyses and recovery of acid in pickling lines, especially for stainless steel. We excel at knowing the customer's particular procedures, and we adapt our equipment to the distinct needs of each group," says Lindberg.

"Only the best analysis system – that's what Scanacon supplies – can determine the concentrations of acid and metals at any time during production. Our analysis systems give a complete understanding of how the pickling process is changing over time, and are able to report and calculate what changes to make to maintain the process at constant values."

When used in conjunction with a Scanacon recovery system, further improvements in the process are possible. Traditionally, control of a pickling process required that acid be continually drained from the pickling baths – a necessary practice that resulted in significant liquid waste. Scanacon systems have the ability to recover over 90 per cent of the acid that would otherwise be discarded to maintain the process at optimum levels.

Production keeps rolling

With a Scanacon system in place, the lifetime of the pickling bath may be extended almost indefinitely. In addition, the recycling process eliminates the contaminants from the pickling process which means that treatment times maintain constant throughout production. For many stainless producers, pickling is a production bottleneck that Scanacon equipment eliminates.

"Our analytical devices uniquely enable us to produce analyses faster than is possible with competitive techniques," says Lindberg. "Our analyzers are based on ion selective electrode technology that we develop and manufacture by ourselves. With these electrodes, one takes a sample cup from the acid bath and, in the analyzer, the precise amount of concentration is revealed within two minutes. Nobody else



Scanacon's equipment has quickly become the industry standard

works with this technique, and none can obtain a test result in such a short amount of time."

Lindberg says that not only is competitive technology slower, but also suffers from complexity and lack of accuracy. Moreover, Scanacon maintains a competitive advantage by being the only supplier to offer a comprehensive line of products and services to address all aspects of the pickling process. Filtration, recovery, analysis and circulation systems all are part of the Scanacon product portfolio. These systems can operate as stand-alone systems, or can be packaged together as total solution.

Growth on three continents

Asia produces half the planet's annual output of

stainless steel, so much of Scanacon's expansion has been in China. For future geographic expansion, the firm is studying India, where Korean and Chinese companies are already starting up. In Russia and Eastern Europe, rebuilding and modernization are also opening markets, and growth opportunities exist in Brazil.

Scanacon conducts research together with Swedish steel facilities as well as the Swedish Environmental Research Institute. "The market is growing both geographically as well as in the areas of applications. We believe that we will see, in the future, new markets in other metals as well as new coatings, and we are working to grow within these new technologies and businesses," says Lindberg.

E.ON decides on major Swedish investment

E.ON Sverige plans to invest €2,2 billion in secured energy supplies during the next three years. These investments will be for new electricity and heat production in Malmö in southern Sweden, strengthening and expanding electricity networks, modernizing and increasing the capacity of existing electricity production, expanding natural gas and constructing new wind power. E.ON Sweden's investments in the supply of electricity are expected to provide an additional 6-7 TWh of electricity from 2009.

"The customer security shall be strengthened. Our investments aim at raising the security of the supplies and at increasing the electricity selection in the Nordic market. Investments in a secure electricity supply are good for our customers", says Lars Frithiof, CEO of E.ON Sverige.

The cogeneration plant in Malmö is planned to provide additional capacity of 400 MW of electricity and 250 MW of heating from 2009. The O3 reactor at OKG in Oskarshamn is planned to be modernized in 2008 and capacity will increase by 250 MW. New wind power is being planned at Utgrunden and Kårehamn. The Utgrunden wind farm in Kalmarund is planned to be put into operation in 2007/2008. There are also preliminary plans for a large-scale wind farm on the Midsjö Banks. This will require additional multi-billion kronor investments and it could provide an addition of 1 000 MW from 200 turbines.

In the next three years, the E.ON Group plans to make investments of approximately €17,5 billion, of which €15,5 billion will be in generation facilities.

Hot idea turns a hot profit

• It is an example of innovation in its purest form, driven not by money but by the desire to solve a technical challenge. But like the best ideas, the Ecotube system has indeed become a moneymaker.

The Ecotube system was designed to reduce emissions in waste-to-energy and biomass boilers, but has proven so effective in optimising the combustion process that it has the side effect of significantly lowering plant operation costs. Its manufacturers claim it will actually pay for itself within a year.

Södertälje-based Ecomb now has 50 Ecotubes operational around the world and a turnover of €4.25m. But overseas markets are showing excellent potential and the company has high expectations for the future.

Ecotubes are retractable lances that are equipped with injection nozzles which introduce, at high pressure and velocity, various agents into the furnace. The Ecotubes are strategically positioned within the furnace to create a radically improved mixing of the combustion products. The idea behind the technology was hatched when Ulf Hagström and Eric Norelius were working as consultants for Sweden's biggest technical consultancy. "We were out doing normal consulting work and we realised that the mixing in those boilers was in general poor, so we said why don't you put something inside the furnace and mix from there," says Hagström.

Hagström and Norelius set about presenting their ideas and sending in patent applications, but encountered resistance from funding agencies, who eventually coughed up about a meagre €21,000 after four applications. But working evenings and weekends on their project while holding down their day jobs, they were able to conduct tests on operational boilers

thanks to contacts in the waste energy industry.

"We got the first contract based on the result of those very basic and preliminary tests that we did in 1994-95, then we quit our jobs and started on the business full time," says Hagström, adding that they were driven by the belief they would succeed despite the odds.

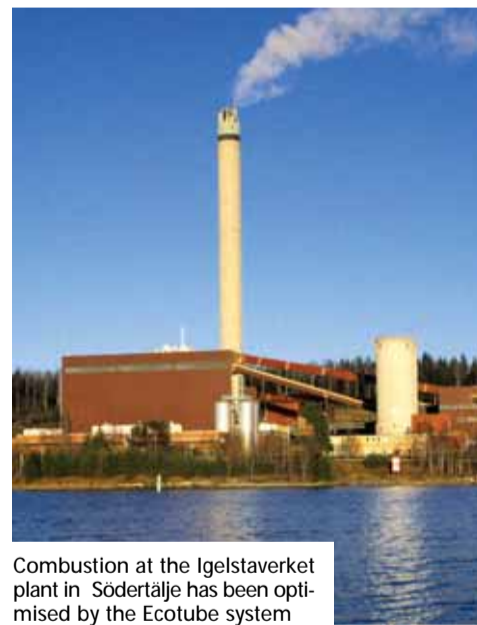
"You have to believe in your ideas, you have to be strong and not give up too easy. The support is too poor in general. You can be lucky and find the right guys but it is also very likely that your ideas will just be ideas and nothing more. But we fought and we didn't give up. We got the first contract and we thought, wow, it works."

Technically focused

At this stage Hagström and Norelius had not really considered that their technology could be a moneyspinner. "I don't think either of us had thoughts of making any money from this, we were so technically focused, we wanted to see this work in practice to see if our ideas could become reality in those furnaces," says Hagström. "By 1996-97 we had sold two more projects, and we realised that if we can sell three, we can sell 300."

Hagström admits to being overly optimistic initially, believing the product was so good that no marketing was needed, and the company was in the red from 1998 to 2003, but then it all started to come together. "2004 was our first profitable year and last year was very, very good," he says. "It took a lot longer than we thought it would, but we have fought all the way. It's not enough just to have the best product in the world. We are aware of that now, and now we have partners we work with in the UK, France, Germany and in North America."

Initially Ecomb marketed Ecotubes on their



Combustion at the Igelstaverket plant in Södertälje has been optimised by the Ecotube system

environmental credentials: reducing NOx by 30 to 90 per cent, CO by 30 to 90 per cent, and flyash by ten to 30 per cent. "There is a lot of talk about green policies, but at the end of the day it is money that counts and nobody does anything if it is not absolutely necessary," says Hagström. "Our product has other features which improve the economy for these plants. That is what we are trying to move towards more strongly than before."

He says that a European waste-to-energy plant can save millions of pounds by installing an Ecotube system. "At one of our reference sites we have increased throughput by about 25 per cent. In general we can increase throughput by between ten and 20 per cent on every unit. That is a lot of money."

A broader approach to the energy question

• There is more to the energy sector than just technology. With that in mind, Linköping University runs a programme which looks at energy questions from both a technical and a social-scientific perspective. The theory is that there is little use in developing new environmentally-friendly technologies if people are unwilling or unable to use them, or decision-makers unwilling to implement them.

Mats Söderström, director of the Energy Systems Programme, which has recently secured €4m in new funding from the Swedish Energy Agency (Energimyndigheten) says: "You have to take into account not only technology, not only economy, not only the actors or decision-makers, but you have to see this as a network that can take care of all those aspects at the same time, to push the energy systems forward.

"You can always present good technological ideas with new processes or energy efficiency or new distribution systems for electricity or district heating, but you have to be able to convince the actors or the decision-makers that the ideas are correct. It is not only to present the technology or the economy behind the technology, you have to get it into the decision-making processes, or it won't work."

The Energy Systems Programme, which started in 1997, is one of only a handful of institutions worldwide which add the systems and social aspects to an interdisciplinary approach to energy research. It consists of a graduate school and a research programme in which five departments from four of Sweden's leading technical universities are collaborating: Energy Processes at the Royal Institute of Technology in Stockholm, Engineering Sciences at Uppsala University, Heat and Power Technology at Chalmers in Göteborg, and Energy Systems and Tema T at Linköping University.

"The programme is very unusual in the broadness of its scope," says Dr Söderström. "It is unusual in Sweden, and it is unusual worldwide. If you look at the people admitted for the PhD positions, you see a very broad range of backgrounds."

Creating potential

Kajsa Ellegård is the leading professor within the social sciences in the Energy Systems Programme. Asked what social scientists can add to energy research, she says: "I don't think

it is a question of adding, it is more a question of creating stronger potential in the energy sector. I think it is very important that you have an understanding of what the potential of a technology is to develop to something that people will want to use. Then you do not waste a lot of resources to develop something that will not be possible to introduce, and for people to domesticate.

"This is the most important part of the social perspective – that you have to know the actors' motives and their abilities and their knowledge and background to be able to understand why they apply those things that are developed, or why they don't do it."

Prof Ellegård says this cooperation between social science and technology takes place on many levels. "At one level, this cooperation is very basic, where technology students or researchers work together with social science researchers at a very concrete level, at the level of housing, and here they complement each other in one way.

"Then there is another kind of social science involvement, that is theorising about the importance of how energy is used and how people domesticate energy appliances and get used to energy systems."

Dr Söderström says that most of the new funding for the programme, announced in April, will be spent on ten new PhD students working for the next three years on three areas. "In the first of these we will look at those large Swedish development sites for black liquor gasification, for ethanol production, for gasification of biofuels, but not from the technical perspective because other people are doing that," he says. "We will look at how those will be integrated with municipal systems, how those could be integrated with industrial systems in the best way from an economic and a general environmental perspective. And then come the other questions around decision-making and political rules and so on."

Dr Söderström says the second area will be looking at small-scale housing equipped with solar cells, and then analyse and compare the potential of small-scale energy systems with large-scale energy systems. "And the third area will be energy efficiency in energy-intensive industry," he says. "There has been a lot of work done in this area, but there has been little collating of the results, interpreting what they really mean in terms of real energy efficiency that it is possible to realise."

Kajsa Ellegård and Mats Söderström: pushing the energy system forward



Cutting edge: the SYSAV plant in Malmö

Upswing for Götaverken Miljö

• "It is with great satisfaction that we can report that our focused efforts and concentration on unique products within our core operations – gas cleaning, energy recovery and service – have led to a stable level of profitability and excellent results for the company in 2005," says Lennart Gustafsson, managing director of Götaverken Miljö.

Götaverken Miljö develops, designs and supplies products and facilities for the cleaning of environmentally-hazardous emissions, energy recovery and cooling generation. The company offers the unique and leading patented ADIOX and MercOx products for the cleaning of gases containing dioxin and mercury as well as carries out consulting and service assignments in all product areas.

The company is located in Göteborg and has its origin in the Götaverken companies, a large industrial group comprising shipyards and boiler manufacturing with a history dating back to 1841. Götaverken Miljö AB was founded in 1988 as a spin-off from Götaverken Energy, and has been owned since 1998 by the Sixth AP Fund.

Delivery in record time

Asked to give examples of recent achievements, Gustafsson mentions SYSAV – the municipal waste disposal company in Malmö. "Our contract with SYSAV was to supplement their incineration lines one and two with a common scrubber system for gas cleaning and energy recovery. The project was completed in 13 months – solid evidence that our patented and compact scrubber system is highly competitive."

Gustafsson says that 15 deliveries of their ADIOX technology for dioxin removal were made in 2005 so that today it is being used in 40 waste incineration plants throughout Europe, the USA and Canada. "During 2005 we also secured an order to equip waste incineration lines one to four for a major waste disposal plant in Copenhagen worth over €1.1m. This represents the biggest delivery to date of ADIOX material to an existing facility."

Customers are to be found within energy production, mainly energy from waste, as well as the processing industry, steel/metal and chemicals. "We also carry out consulting

assignments within our specialist areas, and we can in partnership with customers supplement deliveries with incentives – defined during the implementation phase – to find the best solution for the end customer."

Gustafsson underlines their close collaboration with Forschungszentrum Karlsruhe for the development of their patented ADIOX and MercOx. This gives Götaverken Miljö AB the sole rights globally to sell and manufacture this technology.

Increased awareness

The advantages of the company's ADIOX technology have now also been highlighted in the BAT (Best Available Technologies) Reference Document, BREF, for waste incineration and which is pending a decision at the EU Commission. "If it gets the Commission's blessing, this document will provide licensing authorities with reference material regarding the best available technology prior to their making licensing decisions. This will increase awareness of our technology as well as its positive features," says Gustafsson. "Furthermore, we now develop programmes which offer our customers permit control and analysis of existing ADIOX installations. This means that we can determine the remaining lifespan of installed ADIOX material and, in doing so, we can assure the long-term operating safety and economy of the facilities."

The MercOx process is also being tested in a new application at one of Europe's leading petrochemical companies. "Our hope is that it will be installed permanently during 2006 and, thus, will contribute strongly to minimising emissions of mercury from this facility."

Gustafsson says Götaverken Miljö is expected to become regarded as the most innovative supplier on the Nordic market and to be the preferred choice of industrial customers. "We also aim at providing the leading expertise in the field of dioxin and mercury removal from gases as well as the servicing of large heat pumps. Our ADIOX and wet scrubber technology will be marketed globally using a network of agents/dealers and partners, both for tower packing supplies and complete scrubber packages for gas cleaning and dioxin removal." In this process they are presently working closely with the Swedish Export Council's Swedentech project in order to find such partners on local markets.

Indian-born Canadian wins Water Prize

• Professor Asit K. Biswas, a tireless water proponent who constantly challenges the "status quo" and who helped foster a critical re-think about how to improve delivery of water and sanitation services and management of our water resources, is the 2006 Stockholm Water Prize Laureate.

In its Citation, the Nominating Committee wrote: "Professor Biswas is awarded the Stockholm Water Prize for his outstanding and multi-faceted contributions to global water

resource issues, including research, education and awareness, water management, human and international relations in both developed and developing countries. While many highly-

qualified experts in aquatic disciplines distinguish themselves as academicians, others as practitioners, others as government advisors, and others as writers and lecturers, Professor Biswas with his wide knowledge is highly recognised in all of these areas and, most importantly, has over a broad front applied his skills internationally, thereby adding new dimensions to the wise use and management of the global water resources."

While many water experts have through the years contributed highly effective methodologies to the rational use and management of water resources, Prof. Biswas fostered a new "socio-economic and political climate" which enabled the effective translation of scientific and technical advances into meaningful measures. Two of his many achievements exemplify his role as a global facilitator of international platforms where organisations and individuals can take concrete action on water:

As the main scientific advisor to the Secretary-General of the United Nations Water Conference in Mar del Plata, Argentina, in 1977, Prof. Biswas helped to formulate and promote the International Water Supply and Sanitation Decade. After approval of this initiative by the UN General Assembly, Prof. Biswas advised international and national institutions on how the Decade could be implemented.

Concerned with the fact that potential water leaders of the next generation are not being heard at major international forums, he initiated a three-year programme with the support of the Nippon Foundation, to select and mentor potential water leaders from all over the world who were below 40 years.

A man of many roles

Many of his additional activities have also helped to solve international and regional water problems. Prof. Biswas has acted as an advisor and confidant to policymakers in water and environmental management in 17 countries, to six heads of the United Nations agencies and to other international organisations. The Third World Centre for Water Management, a "think tank" initially set up by Prof. Biswas to give independent and authoritative policy and knowledge support to developing countries, also regularly advises many industrialised countries.

Prof. Biswas also founded the International Journal of Water Resources Development and continued as Editor-in-Chief for the past 21 years. He has been involved in the writing of 64 books, among them Water as a Focus for Regional Development, Integrated Water Resources Management in South and Southeast Asia and Water Institutions: Policies, Performance and Prospects.

The Stockholm Water Prize is a global award founded in 1990 and presented annually to an individual, organisation or institution for outstanding water-related activities. The Stockholm Water Prize Laureate receives € 115,000 along with a glass sculpture, which will be presented during the 2006 World Water Week in Stockholm, August 20-26. HM King Carl XVI Gustaf of Sweden is the Patron of the Stockholm Water Prize.



Asit K Biswas



Fly with a clear environmental conscience

SAS makes strict environmental demands when ordering new aircraft and engines. We do so because about 90 percent of our environmental impact occurs when we fly. Our environmental demands have been decisive in improving our own environmental performance and, at the same time, have encouraged the international aviation industry to develop quieter and cleaner aircraft. SAS, in cooperation with Boeing and several of engine manufacturers, is currently conducting projects to find solutions that will reduce noise from existing aircraft and engines. Read more about SAS's environmental work at www.sasgroup.net

It's Scandinavian



A STAR ALLIANCE MEMBER 

Selling sustainability to China

• Despite cut-throat competition from leading architects from the US, Japan, the UK and France, Swedesign Connection – an architect group based in Kalmar – has been short-listed to take on a vast sustainability project in Shanghai.

“This entails advising the Chinese authorities on how they can work out functions and solutions in harmony with surrounding areas and neighbourhoods in order to create a sustainable society,” says Rolf Möller, managing director of the architect group, Swedesign Connection AB. “In fact, our links with China were initiated five years ago when we were asked to advise architects in Beijing involved in the preparations for the Olympic Games there. My architect company was far too small to take on such a task, so other related companies here in Kalmar as well as an architect firm from Göteborg were invited to get involved.”

Prize-winning projects

Their first success in China was in 2002 when they got involved in creating a top-class environment for living as well as recreation at Ban Yue Wan (Half Moon Bay) in the coastal city of Weihai. “Focus was on finding a balance between new and old, nature and urbanism in order to retain the harmony of the place and its surroundings,” says Möller. “This became a prize-winning undertaking which opened the door for further assignments in China.”

The Yantai Road project in Weihai came next, which involved designing the boulevard covering two million square metres so that people can meet, work, study and enjoy city life 24 hours a day. “Again, this became a prize-winning undertaking that we shared with a Chinese counterpart,” says Möller.

Urban design

“We then got involved in the Tianjin project resulting in plans for creating a sustainable city with a worldwide reputation. By this stage, we realised that we had to transfer forces to China by employing Chinese architects who could continue promoting our sustainable city ideas. This has already paid off now that we have be-



Swedesign's prize-winning vision for Weihai's Half Moon Bay

come short-listed for a vast urban design project in Shanghai.”

Möller says that an urban design for Shanghai has already been completed by an Italian firm but that the authorities now want a second opinion before going ahead. “If we are selected, our mission will be to advise them how to work to minimise the impact on the environment as well as how nature and the rich Chinese cultural heritage can be harmonised by using modern technology and know-how.”

Shared values

“All of us involved in the Swedesign Connection group share common, fundamental values on ecology, architectural quality and urban design. This means that, by deepening our understand-

ing of environment whereby we look back as well as into the future at the same time, we can build better and more sustainable platforms for coming generations. No other single issue in the world consumes as much of our limited resources as building does. So, we have to learn how to use diminishing resources carefully under the guidance of the earth's ecosystems.”

When putting their philosophy into practice, Möller says that they work in very close conjunction with builders as to how specific solutions can be implemented to fulfil their intentions with as little impact as possible on the environment. “By working together, we find time and time again that sustainable solutions are often the best and not more expensive either.”

A partnership initiative

Möller rounds off by stressing their involvement in “The Sustainable City”, an initiative with the aim of offering a holistic concept for sustainable urban development. Sponsored by the Swedish government and the Swedish Trade Council, the ambition is to gather and communicate comprehensive knowledge on the most innovative and inspiring urban solutions by sharing experiences in the field of applied environmental technology and management. “Our participation enables us to extend our links with network groups both in Sweden and China which give us the best input for our diversified sustainability projects,” says Möller.

J E H

Composting made easy

• Residential complexes as well as hotels, restaurants, schools and other official institutions can now easily and directly convert food waste into ready-to-plant soil with composting equipment manufactured by Göteborg-based Susteco.

In about 40 to 60 days, lawns, gardens, flower beds or even house plants can receive high quality composted soil, and environmentally-conscious neighbours can avoid additional treatment and expensive transportation of food waste with models of a single unit composting device from Susteco AB.

In various sizes that occupy about the same space as a large metal trash bin, Susteco's composters are adaptable to installation solutions in locations that handle conventional garbage disposal. Virtually free from maintenance calls, the composters are operated, filled and emptied

by users, who can be neighbours, shop workers, or caretakers.

“Our machinery entirely enables local handling, on the spot, without specialised personnel,” says managing director Ylva Ahlström. The process takes eight to ten weeks from beginning to end. While it's in the cylinder, the material rotates and blends. The compost that comes out is only ten per cent of the weight of the food waste that was originally loaded. By the time that it reaches the output chute, it's ready to serve as a nutrient for plants. Besides using the output compost immediately, it can be mixed or stored directly on the ground, which allows worms and microflora to work their way into it, further improving it.”

Waste scraps in, compost out

The ALEtrumman/Big Hanna machine was invented by a sociologist, Torsten Hultin, and

was designed, not only to provide a safe, easy-to-use and effective means of disposal for food waste, but also to be a ‘social tool’ that residents and users would interact with that would help them become more aware of food and other wastes, such as packaging.

In operation, food waste is fed into the front of the cylinder and slowly moves toward the other end during rotation of the cylinder until the finished compost ejects from the back of the system. Rotation of the cylinder supplies oxygen to all the material, although additional aeration is provided by a fan that continuously draws preheated air into the cylinder.

Food waste usually has a high water content, which is essential for an effective biological process. Installations that have fluctuations in volumes of food waste can be fitted with a water injection system to keep the biological process alive.

With some models, compost automatically comes out when the machine rotates counter-clockwise. Larger models utilise a screw conveyor to feed the finished compost out of the machine. Exhaust air from the composting process can be treated for odour very effectively by installing a bio filter. Other options include a steering box connected to a computer that can control settings and record temperature data, feeding tables, automatic pellets or sawdust feeding, shredders and also automatic output of the compost.

Susteco's local alternatives to food disposal provide minimal footprints and have minimal visual impact. More significantly, no waste is left to attract pests. Because smelly food waste is being dealt with at home, the weight and

regularity of collections are greatly reduced. Transportation expenses, environmental problems and heavy garbage vehicles are therefore eliminated. Furthermore, activating local disposal activities awakens public awareness of waste that results from people's excessive consumption.

90 per cent bulk reduction

“It works reliably. It's hygienic. It provides really good compost,” says sales manager Hugh Creighton. “Compost is biologically safer because it stays in our system for a long time. We kill the pathogens, and, with two other stages of composting, we get a 90 per cent reduction that is truly compost and does not require further curing before use.”

Since Susteco was founded in 1997, more than 600 of its machines have been sold. Two general models of the composting units – the Neter and the ALEtrumman/Big Hanna – respectively handle 1500 kg and 15 tons weekly.

“Numerous customers realise that our system can pay for itself, and companies also find that Susteco's equipment adds positively to their environmental image,” says Ahlström.

Larger installations

The Eden Project in Cornwall was Susteco's first UK installation. Here, a Neter composting system handles 1,300 to 15,100kg a week of animal and dairy products that had previously been sent to landfill. The most recent installation is an eight cubic meter unit that handles 3.5 tons a week at an Irish hotel and resort facility.

“We're expanding in a slow but steady manner by locating key clients. Anywhere in Europe, there's a potential market, especially due to the European Biowaste Directive, and we see great potential at hotels, resorts and institutions,” says Creighton.

Kelly's Resort, in Ireland, has reduced its disposal costs with a Neter Composting System



Filtering oil from air

• Oil mist, smoke and dust in contaminated air that is emitted from industrial metal working, die casting, cold forming and milling are the main targets for the Swedish world leader Absolent.

A world leader in their environmental technology speciality, Absolent makes machinery and filters that arrest dangerous particles and prevent their emission into the atmosphere. Absolent's equipment often contributes to lower energy consumption and frequently enables reuse of cutting fluids.

"Our task is to clean up polluted air that results from metal manufacturing machinery," says Tony Landh, CEO. In machining metals, a cooling liquid is used to prevent metal from overheating. This entails some sort of oil, and it results in oil mist or smoke. The firm supplies oil mist filters, oil smoke filters and dust filters.

With basic models as a starting point, and their own laboratory facilities for research and development, Absolent projects involve engineering with each customer and facility in order to achieve the best air quality and purification.

On the job performance

For instance, in operation on the factory floor, Absolent's oil mist filter sucks contaminated air into an inlet in the bottom section of the assembled unit. Most oil particles are trapped here as air passes through the first pre-filter. When this pre-filter becomes saturated, oil is drained into a collection tray and then passes out through a return pipe. The air then proceeds through a second pre-filter where remaining large particles are separated. The air is then sucked up through the fan and filtered

through the Absolute filter, after which it is usually clean enough to be returned directly to the premises.

Normally, filters will last more than 2 years. Absolent's oil smoke filter guarantees over 99.99 per cent separation of particles down to 0.3 mm. This degree of separation does not deteriorate, and it far exceeds legal requirements. Fire test approved with a low noise level, Absolent's oil smoke filter incorporates self-draining pre-filters that allow continuous operation and with long service intervals. Filter cassettes are modularised to facilitate all sizes of installations. Absolent also offers self-cleaning cartridge filters.

"Innovation laid the foundation for Absolent's filtering techniques back in 1993. We have taken this innovation from a discovery to today's range of products, which are known around the world. Since our founding, we have witnessed a rocketing growth on an average of around 25-30 per cent annually," reports Ulf Dackemark, Sales & Marketing Director.

Pioneers in filter techniques

In merely the aerospace industry, among their most hi-tech customers are Boeing, Sikorsky, Volvo Aero, Rolls Royce Aero Division and others. According to Landh, the reason that their products received outstanding market acceptance from the outset was because, "We did everything precisely the opposite as the rest of our competitors."

"In the past, this has been a relatively unqualified field. Many filters were sold that required incredibly much maintenance. You needed to exchange the filters almost as often as your kitchen coffee filters! Firms sold equipment cheaply, but amassed huge sums from maintenance. Even worse, their filters didn't do the job for which they were intended," relates Landh.

"When we entered the market, we guaranteed long lifetimes for our machinery with a minimum of maintenance costs. Air that we process and release is so highly clean that it can be approved by surgeons for use in hospitals. Our sales force carries portable instruments that show our customers the high quality of the air that is released after processing," notes Landh.

Five more years

"Our home market reaches throughout Europe, including the Eastern Europe countries. We're undisputed leaders today in Sweden, and we're growing strongly in the export marketplace," comments Dackemark, who believes that Absolent's 30 per cent increase rate will persist during at least another five years.

Expanding their product family, Absolent has cooperated with Alfa-Laval on a smaller filter device, dubbed "G-1" and scheduled for unveiling this summer. Absolent's principle owner, Joachim Westh, second in charge Ericsson, is joined by another owner, Ericsson's chief, Karl-Erik Bromberg, and both are on our board of directors. With an annual turnover of €7.5 million and headquarters in Lidköping, Absolent has operations in North Carolina, which handles the American market, and a sales staff in China to cover their expanding Asian activities.



Crambe does not cross-pollinate

Squeeze plants, collect motor oil

• Genetically engineered crops will be tested by the Swedish University of Agriculture (SLU) and will lead the way to lubricants that are more efficient and better for the environment than the petroleum-based ones in use today.

Crambe (*Crambe hispanica abyssinica*) is a species that resembles mustard. It has small, greenish brown seeds with nearly black cores. It's grown on a small scale in the UK, where it yields substances for treating plastic bags.

The job of developing the crambe into a potential source of industrial oil with outstanding lubricating qualities – superior to those of traditional oils that are derived from vegetables and fossil-related minerals – is a project that's being undertaken by professor Sten Stymne and his research group at SLU. At the Institution for Crop Science on SLU's campus in Alnarp, in southern Sweden, Stymne hopes to start growing plants in the test fields next year that can yield high-performance oil for gear boxes and, in the future, numerous other industrial purposes.

"This is a worldwide project in which nations including the US, Canada and China are also involved," he says. "We are utilising genetic techniques to produce a new quality of oil that does not exist today among our ordinary plant oils. From the jojoba plant (*Simmondsia chinensis*), which grows in deserts, we clone genes and then insert them into the crambe plant."

As good as Moby Dick's

Over a century ago, in the earliest days of motor vehicles, whale sperm was in general use as an automotive gearbox lubricant. Obtained brutally from the sperm whale – the same one as depicted in the novel, *Moby Dick* – it was so good that one never needed an oil change. But it soon became expensive and was replaced by petroleum products, albeit with inferior performance. Jojoba oil's lubricating qualities compare equally to the sperm whale's.

Jojoba oil tolerates high temperature and pressure. This makes it superior to conventional vegetable oils. In recent years, jojoba oil became known in the cosmetics and toiletries market, but Jojoba oil is quite expensive. Therefore, for industrial purposes, its high cost prohibits using it as a motor vehicle lubricant.

Worse yet, Jojoba oil's natural benefits disappear in even slightly chilly climates because it begins to solidify at only 8 degrees Celsius. Therefore, Stymne and his group have dedicated their efforts toward synthesizing a more versatile, less expensive and easily produced version of the oil through genetic manipulation.

Relieves genetic worries

They also selected the crambe plant for the experiments because it does not cross-pollinate with other agricultural plants. Thereby, they avoid contamination of other agricultural products. To a great degree in industry, agricultural

products already replace petroleum-based ones. On the other hand, Stymne is aware of mounting consumer attitude barriers in Europe against genetically modified products of any type.

"It's important to show the public that we can utilise the techniques of genetic modification in an environmentally harmless manner that conserves on [fossil-based] mineral oil consumption," says Stymne. He adds that final derivatives of Jojoba will be environmentally friendly and non-toxic.

In China, Jojoba genes have already been inserted into the genes of the crambe plant, and this has produced the first "transgenic" plants, which are the in-between generation from which seeds come. They are now waiting for these stepping-stone plants to grow and produce the seeds that will be the first generation in their variety of jojoba oil-producing crambe plants.

"If all goes according to expectations, by the end of this year, we will obtain the seeds from that will grow into the new crambe plants. Thereafter, we hope that we will have some crambe plants growing for field research here in Alnarp next year," says Stymne.

Plants replace refineries

For some products, the plants can simply be pressed and the oil that comes out can be used in motors. Other products might require factory refinement. An important objective surrounding their endeavours with the oil entails reducing or entirely eliminating the need for subsequent factory processing or chemical refinement of the harvested or pressed vegetable oils to produce lubricants.

"You can say that we're moving the refineries inside the crambe plant itself," says Stymne. "We're letting the plant do much chemical alteration of the oils on its own in order to bring these as near as possible to the final product. In this manner, we eliminate tremendous costs that are associated with refinement of mineral oils today," remarks Stymne.

"We reckon that it will require ten to 15 years before our research leads to commercialised products. The idea in the long run is that we would be able to produce different varieties of this oil-bearing plant, each with distinct characteristics. It is quite possible that we will research other plants outside the crambe's (*Cruciferae*) family to develop the qualities we are seeking in oil."

The institution at which this pacesetting work is being carried out, the Swedish University of Agriculture, is the country's largest such institution, and it conducts research and education throughout the nation. SLU also focuses on enabling farmers to grow crops that overcome competition against international suppliers in European market. "There is still a long way to go until the crambe is developed as an established agricultural product. But the first important steps have been taken, and the future looks quite promising," says Stymne.

SWECO wins Bangladesh contract

SWECO, one of the Nordic region's leading providers of consulting services in the fields of engineering, environmental technology and architecture, has been awarded a contract to improve drinking water quality in the Bangladeshi capital of Dhaka, an important breakthrough in a country with urgent environmental needs.

"The assignment in Bangladesh represents an important step for us. The need for modern environmental technology is enormous and we are also seeing rising demand for our environmental services from other countries in the region," says Per Johansson, Managing Director of SWECO's Water and Environmental unit, SWECO VIAK.

SWECO VIAK will study raw water quality in the Lakhya River, from which drinking water is distributed to millions of people in Dhaka. At present the water flows into the city's large-scale Saidabad water treatment plant, whose capacity will be doubled. Several alternative measures to improve water quality will be evaluated and the assignment will provide a basis for deciding which is the most advantageous.

The contract is worth over €210,000 and will be funded by Sida, the Swedish International Development Cooperation Agency.

Replacing oil with wind and water

• The future is rushing toward us when it comes to production and storage of power, a field in which Morphe Technologies' equipment and innovations have raced beyond the "cutting edge" to standing prominently "on-line" in the market.

The global market for fuel cells is growing by 50 per cent per year, and in five years, it is expected to turn over more than €35bn annually. Laptop computers, mobile telephones and video cameras are a few among an endless list of devices that are being designed at this moment to operate with fuel cells which will last longer than ordinary batteries, rapidly recharge (by refilling) and are friendly to the environment.

The same sort of fuel cell power units that operate cell phones or even smaller devices can be produced in gigantic sizes to deliver as much electrical power as a nuclear generator. According to Peter Heidlund, CEO of Morphe Technologies AB, we're also only about five years away from using them instead of petrol to drive our automobiles. Prototypes are already on the road.

Available in all sizes

Fuel cells, which can contain either hydrogen or methanol, can vary from a square millimetre in size to a cubic meter or more. One obtains



Peter Heidlund: total solutions

about a watt of electrical power for each square centimetre in a plate within the fuel cell.

Both fuel cell propellants can be produced using windpowered generators whose electricity converts water into hydrogen or biomass into methanol. Windpowered electricity generators and energy converters are also proprietary products made by Morphe Technologies. In addition to building machinery for giant wind parks, they produce individual tailor-made systems as turnkey installations that produce ready-to-use fuel cells.

"Through our subsidiary, Cell Impact, we combine a special type of our own windpower generator, fuel cells and all else into a stand-alone system. It's not necessary to connect to commercial power networks or to acquire a gigantic wind power farm to have your own fuel cells," he says.

Heidlund says that Morphe provide customers with comprehensive services. "We make comparative calculations for energy costs between our systems and conventional power suppliers. We also provide financing solutions such as leasing. Of course, having total solutions including our own specialised equipment manufacturing keeps our prices attractively competitive."

Fuel-independent households

Morphe Technologies system enables independent self-sufficiency at factories, business buildings, hospitals, institutions, schools, farming operations, or even in remotely-located

private homes. In terms of size, an ordinary home would require a converter that delivered about 7.5 kilowatts to replace their oil-burning furnace.

"You can buy a small wind power device that's about as tall as a flagpole, and then connect this to a fuel production system and fuel cell," says Heidlund. "In the newly-acquired company, Aerodyn AB, we're now in the process of producing and selling our own complete windpower assemblies including the towers in sizes from one to three megawatts. You've got your own energy production system. The fuel cell production system is by no means limited to large power plants.

"The market for wind generated electrical power is exploding in the Sweden and globally. The company's target is to retain a 20-25 per cent share of the Swedish market as it heads to dramatic expansion in coming years."

Heidlund says that their windpower generators embody second-generation technology that solves conversion of wind to electric power and eliminates many service costs. Comparing kilowattsgenerated to the amount invested and including maintenance expenses, their wind power units deliver an average of ten to 15 per cent more.

High impact for low prices

Like most breakthroughs, obstacles have needed to be overcome, and for fuel cells, the stumbling block was the high cost of expert labour. Precisely channelled flow plates are an integral part of fuel cells. Morphe Technologies' subsidiary, Cell Impact AB, utilises high-impact forming for manufacturing of flow plates for fuel cells and heat exchangers in large quantities at low cost. Their process allows highly detailed flow fields in both graphite and steel materials.

The unique and patented high-impact technology reduces the production costs for flow plates for the fuel cells by as much as 90 per cent, and the high-speed process can turn out 1,000 plates per hour. The high impact stamping method also minimises waste factors. Morphe's Cell Impact subsidiary has become the first to offer mass production of these key components in the fuel cell system.

"From the company's beginnings, we realised that our technique was applicable to producing flow plates for fuel cells," says Heidlund. "In fact, all sorts of products can be formed by high-impact procedures. Today, we have our own totally automated factory in Karlskoga, and we also license use of this technology to other businesses in the market that as long as they are not involved in the production of fuel cells. Our Dynamis subsidiary handles licensing of this technology."

In another phase of its operations, Dynamis also handles orders that come from the automotive and electronic industries for flow plates and also heat exchangers.

Toughest nut to crack

"Automotive applications are the most difficult challenge of all areas," says Heidlund. It requires around 600 A4-size fuel cells to operate an automobile. However, Heidlund believes that in about four to five years, large car companies will have tackled these barriers and introduce fuel cell powered passenger cars.

In volumes of a few thousand flow plates, he foresees that 30 per cent of the cost per unit will be material, and Morphe Technologies will be able to reach the automotive industry's objective to purchase the plates at about €3.25 apiece. By 2012, the company sights at being an internationally leading supplier with a 50 per cent market share for the high-performance flow plates.

Following in place after nuclear power, hydroelectric power is the most common source of energy in Sweden. Morphe Technologies also serves as one of Sweden's foremost maintenance and service firms for hydroelectric power plants, and its activities cover renovation of turbines, technical upgrading and continuous service.

TERRY BLUNK

Sustainable knowledge network



• Sustainable hospitals – where the potential for energy savings is greater than for perhaps any other type of building – are one of the focuses of a Skåne-based organisation which aims to generate business overseas for Swedish environmental technology companies.

Sustainable Business Hub creates networks between businesses, academia and the public sector and has been singled out in a Ministry for Foreign Affairs report for its success in creating trade opportunities in the Baltic region.

The Sustainable Hospital project is run by Sustainable Business Hub together with Nutek, the Swedish agency for economic and regional growth, and Region Skåne, which is the regional public body responsible for health and medical services, and a number of specialist companies. Skåne has for several years been at the leading edge of creating sustainable hospitals, and the project arranges technical visits to learn from the region's example, as well as offering education and training in how to manage this sort of institution. The project is promoted at international healthcare seminars and exhibitions.

"We have an understanding of the complexity of a sustainable hospital, and we have the means to solve the technical issues," says Karl-Erik Grevendahl, who is director of the Sustainable Business Hub. "We get different companies together and what they create is a holistic concept, combining knowledge, equipment and complete solutions. Our companies focus on building design, energy saving systems, water management, interior air treatment, and energy-efficiency."

Sustainable Business Hub is a non-profit member organisation which is financed Region Skåne, Skåne county council, the Ministry for Foreign Affairs and Nutek, as well as its private sector members. The size of the companies involved ranges in size from one to 15,000 employees, and they come from the length and breadth of Sweden.

About half of Sustainable Business Hub's

operation focus on foreign markets, particularly Poland, south China, Singapore, the UK and the Middle East. SBH has been particularly successful in Poland, where it has been active for more than four years in two projects called Baltic Ecocities and Baltic Eco-Regions. "We have helped about 56 Swedish companies come into that market," says Grevendahl. "And they have made a lot of money in Poland. The companies have already sold for more than SEK 45m [€4.85m], and have tenders out for a further SEK 100m [€10.8m]."

Stronger together

Grevendahl says that member companies in the network benefit from an exchange of knowledge and increased impact on potential customers. Customers benefit from getting access to complete system solutions and can avoid having to deal with many individual companies. "What we can create is building concepts, not only one product but a concept containing a lot of products and knowledge," he says. "Instead of sitting down with one company, they can meet maybe 15 when we are abroad, so it saves them time. And the smart idea is that when you put these companies together they will be stronger than if they were alone."

Beside the sustainable hospitals concept, SBH also focuses on greenhouse gases, housing, water purification and food. Grevendahl says that Sweden's strong reputation in environmental issues is an advantage when it comes to drumming up business abroad. "We have a good name abroad and a long tradition of working with environmental protection," he says. "People know our companies have created a lot of new and leading technologies. But also Swedish legislation has forced companies to work in new ways, and the academic sector has made a lot of interesting studies and developed many new technologies that have been brought into industry."

SBH cooperates with other similar organisations based in Kalmar, Göteborg and Stockholm in the Association for Swedish Environmental Technology Industries network.

International drive for ethanol

Scania, the world's only manufacturer of ethanol-powered commercial vehicles, is supplying the city buses for use in the BEST consortium's field trials of ethanol as a vehicle fuel. The initial trials will take place in La Spezia, a coastal city in north-western Italy.

The aim of the BEST consortium (BioEthanol for Sustainable Transport) is to support large-scale use of ethanol as a vehicle fuel. Among other things, it encompasses the building of ethanol refuelling stations and the launch of trials involving both cars and city buses in ten locations throughout the world. In addition to La Spezia, Stockholm, Rotterdam, Dublin, Madrid, Basque Provinces (Spain), Nanyang (China) and São Paulo (Brazil) are taking part.

The BEST project was started up by representatives of the Stockholm Public Transport Company (SL) and is partly financed by the EU. The aim is to pave the way for broad-based acceptance of ethanol as a viable alternative fuel for both cars and commercial vehicles.

"Ethanol is an excellent renewable fuel for heavy commercial vehicles in urban operation," says Bengt Rasmusen, MD of Scania Bus Italy. "We regard this project as an important first step towards sustainable urban transport with renewable fuels. The environmental potential is great and Scania is using a proven technology that is fully up to the demands of tough urban operation."

The public transport company in La Spezia, ATC, has 250 buses in its fleet and transports around 18 million passengers per year. ATC will start operating three Scania OmniLink ethanol buses in its city bus fleet in September.

the SUSTAINABLE city

A SWEDISH PARTNERSHIP INITIATIVE

The ambition of the successful project the Sustainable City is to gather and communicate comprehensive knowledge on the most innovative and inspiring sustainable urban solutions. The ambition is also to encourage the development of cities with a clear ecological profile and with a high level of environmental consideration.

The concept was first presented at the world summit on sustainable development in Johannesburg 2002 and has after that been presented worldwide. The concept has been well received and implemented in several countries, such as China, Canada and South Africa.

Read more on www.sustainablecity.eu

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Everyone wins from SCA's new bioenergy

The northern Swedish city of Sundsvall now enjoys increased alternative and cost-efficient heating solutions as a result of a major investment cooperation between the forestry enterprise SCA, and the city of Sundsvall. In total, this project is worth about €20m.

"Sundsvall as well as our own saw mills have already started getting more heat as a result of this cooperation, and the whole system will be fully operational by the spring of 2007," says Patrik Halling, technical director of SCA Orviken. "This is a ten-year contract with the Municipality of Sundsvall via its heating company, Sundsvalls Energi and SCA Orviken Paper Mill which provides biofuel from pine bark. SCA Orviken has contributed about €5.5m to the project and anticipates a full return on the investment within ten years. We can all expect to be winners as a result of this project – the people of Sundsvall and the heating companies, the paper and saw mills, the local harbour, etc."

Heat when it's needed

As a result of this energy investment and the new techniques implemented, Sundsvalls Energi gets heat from SCA Orviken when the need is at its greatest during the winter. Even the major energy consumer, SCA Tunadal Timber Mill, gets its energy from the same source. The investment cooperation means that SCA has been able to make its heat recycling more cost-efficient thus making it possible to increase its provision of heat to Sundsvalls Energi. At the same time, a hot water pipeline now provides energy from the new waste disposal incinerator at the nearby Korsta heating plant – using biofuel from SCA Orviken – to the SCA Tunadal Timber Mill. This, in turn,

means that Tunadal can now considerably reduce its electricity consumption in its timber drying process.

"Deliveries of energy from SCA Orviken are in the region of 80GWh per year at the present time, but can easily be increased on demand if the production at SCA Tunadal increases. Today, SCA Tunadal saws 320,000 cubic metres of timber annually but its capacity will increase to 600,000 cubic metres when the project is in full swing next year," says Halling.

He explains that supplies of energy are expected to amount to between 100 and 170GWh per year depending partly on the weather and demands. "This corresponds to an annual consumption of heat for between 4,000 and 7,000 private homes, each of which consumes an average of 20,000 kWh. This means a doubling of the amount of energy that was earlier supplied to the heating network in Sundsvall."

Largest biofuel producer

Halling explains that the Orviken mill annually produces 440,000 tons of LWC paper (for magazines) as well as 360,000 tons of paper from spruce pulp (for newspapers). The Tunadal saw mill saws, planes and processes timber from pine taken from the northern Swedish forests of Jämtland and Västernorrland. The annual production amounts to 320,000 cubic metres. Tunadal is also the harbour used for shipping SCA's exports. "Being northern Sweden's largest producer of biofuel, the Orviken and Tunadal mills as well as the Korsta heating plant are all located in easy reach of the city of Sundsvall. With the new cooperation between SCA and Sundsvall, the cost-efficient biofuel energy requirements of all concerned can now be safeguarded."

J E H

Steps ahead in technology

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€100 million ethanol plant

A new ethanol production facility adjacent to the existing Lantmännen Agroetanol's ethanol operation in Norrköping will produce 150 million litres a year of fuel for Swedish motor vehicles.

Only two years from now, in 2008, Sweden's demand for ethanol will nearly double from today's annual level of 270 million litres to 500 million litres.

Also in 2008, the nation's domestic share of ethanol production is expected to increase from 20 per cent to 40 per cent - during the same year that Lantmännen's new ethanol plant in central Sweden will commence manufacturing.

"With the new facility, we will meet customers' demands for renewable motor fuel at the same times as we decrease the necessity to import fossil fuel. Moreover, we will be contributing to decreased greenhouse effects," says Birgitta Johansson-Hedberg, MD and CEO at Lantmännen.

According to her projections, the number of flexifuel cars will continue increasing. She also foresees that the EU will approve an increase of the portion of ethanol in ordinary petrol from 5 per cent to 10 per cent.

The new €108 million facility will consume 400,000 tonnes of grain annually. This will require a growth area of 70,000 hectares. The new factory's ethanol output will increase Lantmännen's total to more than 200 million litres annually or above 40 per cent of the nation's annual needs in 2008.

Locating the Norrköping plant directly beside the existing Lantmännen facility will also save by combining operational outlays. Another benefit is being able to use the huge storage capacity in Norrköping to handle the enormous quantities of grain.

"The new facility is expected to employ about 18 new workers. The facility is advantageous for all of Sweden's farmers in that we anticipate that its operations will consume Sweden's current overproduction of grain," says Thomas Bodén, Board Chairman of Lantmännen.

Crossing boundaries in pursuit of future solutions

• Creating solutions to the world's increasingly pressing energy and environmental problems requires new approaches which cross traditional educational and research boundaries.

The Royal Institute of Technology (Kungliga Tekniska Högskolan, or KTH), in Stockholm, which is one of Sweden's leading technical universities, has established a school to coordinate all undergraduate- and graduate-level education on the topics of energy and the environment. The School of Energy and Environmental Technology (Skolan för Energi- och Miljöteknik, or EMT, www.emt.kth.se) brings together the engineering, technical and economic expertise needed to tackle sustainable development issues on a local and a global scale by exchanging ideas, visions, lectures, lecture material, and research ideas. It runs international Masters programmes within the environmental and energy areas.

"Energy, the environment and water are the among the three most important issues for the world to take care of," says Torsten Fransson, who is director of EMT. "The sustainability issues are tremendously important, and if we can't solve them then future generations might not have such a bright future as we would like them to have."

"The disciplines that we usually work with at the university are chemistry, physics, mechanics – all those traditional things. But in order to move forward you need to have an interdisciplinary view, because energy and environment contain in principle everything."

Key to EMT's approach are focus groups which bring together researchers from different disciplines on different subjects such as biomass gasification, fuel cells, geothermal energy and hydropower, as well as overall and futuristic educational concepts in the field. These groups also draw on input from energy and environmental professionals, industry, agencies and other non-university stakeholders, and their aim is to find technology solutions to energy and environmental problems that are both socially and economically satisfactory. "What is extremely important is that you can get people working together both on the educational and the research side in such a way that they go over the traditional disciplinary boundaries," says Prof Fransson. "Cross-disciplinary issues must be taken care of and we are not only talking about the traditional technical issues, but also have to look at the humanitarian and social aspects of the problems that we are facing. You need to create a interdisciplinary approach, and it is in the interdisciplinary areas where new scientific disciplines will sooner or later appear."

Below we profile three of the 300 or so researchers in the area at KTH, whose work holds great potential in addressing today's and tomorrow's energy and environmental concerns.

Personal enthusiasm

Thomas Sandberg is a relative newcomer to the environmental field, finding his way there via a personal interest in hydropower. The professor at the Department of Industrial Economics and Management is the proud owner of three small hydropower plants, the first of which traces its history back to 1893 when one of his ancestors bought a small mill to power a furniture factory. "I have been involved in small scale hydropower for some time, and as I got more and more interested in that and worked practically with it, I saw that those small hydropower stations were like case studies showing the general features of the changes of the Swedish energy system."

One of his professional research focus areas today is small-scale biomass-based combined heat and power production. Another, and now large-scale, international project with which he is involved is the €27m Sustainable Energy Systems in Advanced Cities (SESAC) project, funded in part by the EU. This project, for



Photograph of membrane distillation water purification pilot plant with five interconnected modules

which Prof Sandberg is responsible for the overall evaluation, involves the cities of Delft, in the Netherlands, Grenoble, in France, and Växjö, in Sweden, and seeks to demonstrate how renewable energy technologies and innovative energy efficiency measures can create a more sustainable local energy economy.

Prof Sandberg's personal enthusiasm for hydropower and professional interest in small-scale combined heat and power production have also fostered an interest in the workings of the power market. He is involved in studies on political instruments as a means of moving the power market in a more sustainable direction, including the "green certificates" introduced in Sweden in 2003 as a way to promote sustainable power production.

"I am also taking a big interest in the CO2 allowances which have been quite volatile recently and which influence the power price to a large extent," he says. "I think that is a very promising instrument."

Prof Sandberg says that as a large, old, and very specialised technical university with a large number of energy specialists, KTH has in the past had difficulties in coordination between its specialists sitting in different locations. "The KTH Energy Center has been a very good start in increasing the collaboration between energy specialists in different fields, and EMT is the next, more serious attempt to develop that collaboration further," he says. "This is kind of virtual network."

A broader perspective

China's rapid growth poses a range of issues for the environment, and the Division of Industrial Ecology of KTH has established a joint research centre together with Shandong University which will be a model for how sustainable development can be built on cooperation between academia and the public and private sectors. This is one of several projects inside the KTH/EMT China Link.

One of the focuses of the Joint Research Centre for Industrial Ecology (JRCIE) is on water issues. "We are now starting a project of water management in the province, and the idea is to develop management plans for the development of water issues," says Ronald Wennersten, who is head of the division. "This covers both fresh water and waste water, but it

includes more than the traditional technology; it is a broader perspective of water management including the social aspects, like how much people pay for water, and information about how to use water, in an area where there is a lot of misuse of water."

Another project is concerned with sustainable residential areas. "In China they are building a huge number of residential areas and an infrastructure they will have to live with for hundreds of years," says Prof Wennersten. "So it is important that there is a more strategic view of these issues. It is not so much pure technology we are working with, it is more technology in an integrated perspective."

The Division of Industrial Ecology works with different aspects of sustainability with a focus on environmental issues, while incorporating issues such as management, social aspects, and sustainable consumption. "We have gone from pure environmental issues, looking at end-of-pipe solutions, trying to clean things up, to a phase where we are looking at the environment as a part of economic and social development," says Prof Wennersten.

Besides China, the division has a large project underway around the Baltic Sea called Coastal Zone Management (Coastman). "There we are working very much with conflict resolution strategies concerning the conflicts between different issues when you develop coastal areas," says Prof Wennersten. "These can be conflicts between different stakeholders, but also conflicts between nations around the Baltic Sea concerning the development of different industries, the environment, tourism and so on."

Among the international programmes the division has established in the region is a programme for the chairpersons of authorities around the Baltic, and an international Masters programme in sustainable technology.

Useful applications

At KTH's division of heat and power technology, researchers are working on an exciting new technology which could have applications ranging from the desalination of water in areas hit by water shortages, to the cleaning of arsenic-polluted groundwater, to the purification of water used in the semiconductor industry.

"Worldwide there is huge potential and huge need for desalination because you have

water shortages in many regions and the situation is only getting worse," says Andrew Martin. "Arsenic contamination of groundwater in Bangladesh is also a serious problem that it is hard to find technological solutions for, but tests have shown that membrane distillation is also promising for getting rid of these difficult arsenic ions."

Membrane distillation for water purification and desalination is a thermally-driven process which uses low-grade heat – under 100 degrees Celsius – to evaporate water. "It turns out there is actually quite a bit of heat available at these low temperatures and often it is difficult to find good uses for it," says Prof Martin. "In power generation you have waste heat as an inevitable consequence, and the key is to try to use that for something useful."

Water is evaporated and passes through a Gore Tex-like membrane which only allows water molecules through. "The idea has been around for two or three decades, but it has not been fully engineered or commercialised, and that is what we are pushing for right now," says Prof Martin.

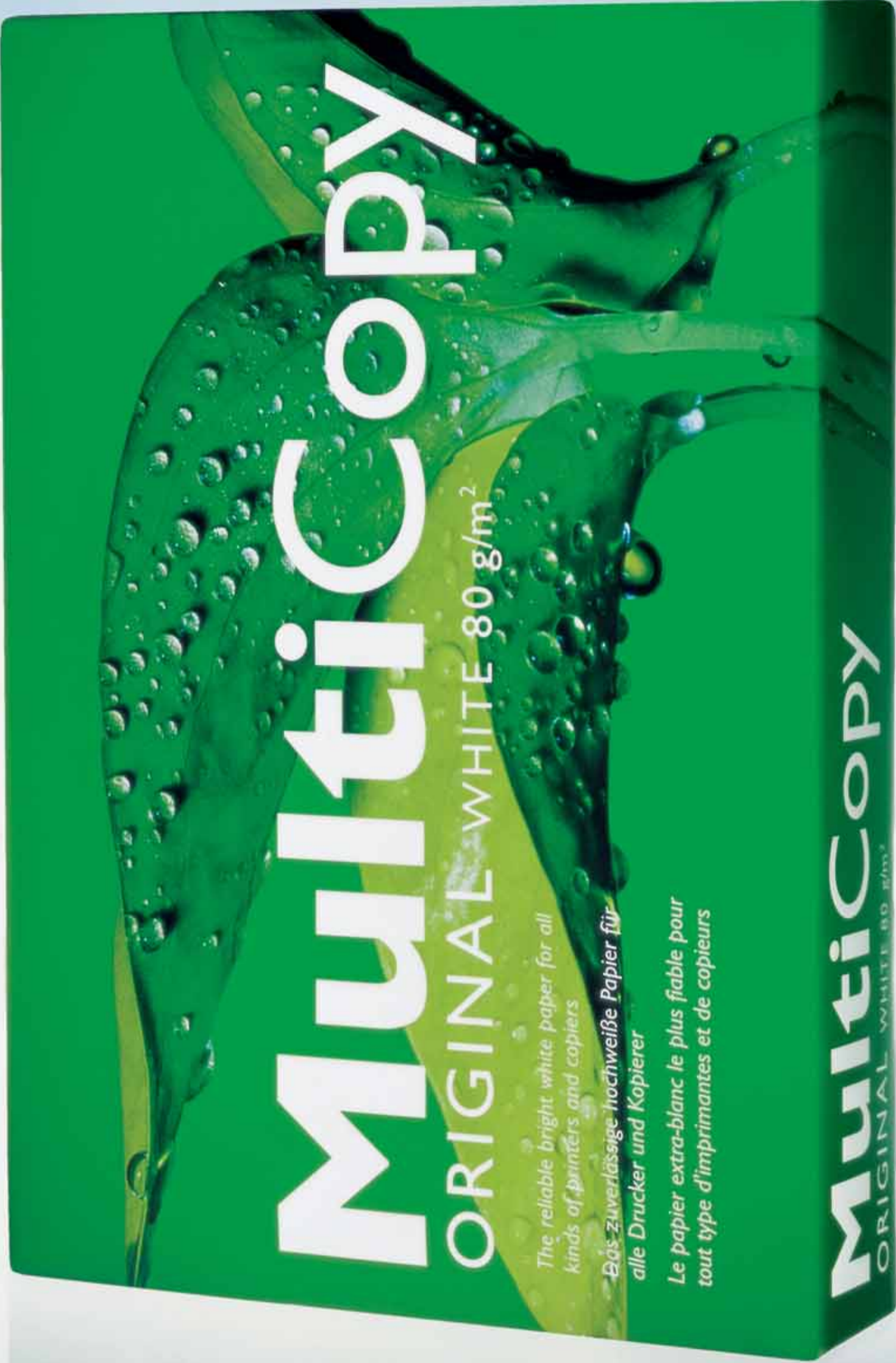
"The idea is to try to use the low-grade heat available at a power plant or district heating plant to drive this process instead of its competitor, reverse osmosis, which is electrically driven."

Early next year, tests on solar-driven desalination will be started in conjunction with a European consortium at Plataforma Solare de Almeria, which is one of the top solar energy research laboratories in the world. "This is a really exciting opportunity because we will be able to demonstrate the membrane distillation process using solar energy as a heat source, so it is a wholly renewable process."

Prof Martin is also responsible for KTH's MSc programme in Sustainable Energy Engineering which has admitted more than 400 students from more than 60 countries. "My predecessor used to promote the programme by travelling round to different universities, but now it has taken on a life of its own and is growing by word of mouth, plus students finding out about it on the internet," he says. "We now have the momentum going and name recognition internationally."

The programme is also offered in a distance education context, and the first batch of students, based in Uganda, will soon be graduating.

STORAENSO



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Major reprieve for pollution sites

• A significant breakthrough has been achieved for cleaning up metal, oil and other contaminated landscapes with a process and equipment introduced by Solventic AB.

Configurable in stationary or mobile systems, a unique system that combines technology and equipment from Solventic removes heavy metals such as cadmium, calcium, copper, chrome, lead, mercury, nickel or zinc as well as amounts of oil, hydrocarbons, bacteria, mould or substances such as dioxins from dirt, sludge, sand, sediment or water.

"This is a breakthrough in an area where traditional processing has never before been successful. Previously, it's only been tested in limited batches in laboratory experiments, but never before in full scale operation," says managing director Sven Suhr.

The system can be proportioned in size to handle any challenge. It can be loaded onto trucks so that the whole setup is ready for erecting and working directly at the pollution's location. In remote terrain without electrical power, the energy of moving water can be harnessed to drive the system or by a standard petrol based genset.

Less remaining volume

The smaller amount of contaminated residue that remains for isolation, extreme recycling or other means of disposal constitutes the overwhelming advantage of their exclusive process.

"The contaminated sludge is a very concentrated mass," says Suhr. "Imagine that a job



entails cleaning 35,000 cubic metres of earth. Using conventional procedures, around 8,000 tons of earth would need to be removed for disposal at a dumping location. With the same job, our process would result in maybe 200 kilos that required transporting."

In action, the Solventic process removes contaminants by treating polluted masses with an alkali or an acidic solution. Heavy metal ions and other pollutants are dissolved into a liquid phase, and then removed by a special adsorption material in a compact and efficient unit. Easy to operate, with low operating, service and maintenance overheads (two pumps are the only moving parts), the process consists of four steps. The first entails mixing water and chemicals. In the second phase, this fluid is mixed with the polluted soil or sludge. At this point, contaminated metals and oils transfer into the water as ions and suspended particles.

In the third step, the remaining mixture goes into a dewatering phase that separates the soil itself from the fluid. Remnants in the soil

are so few that they are far beneath hazardous levels. The fourth stage removes heavy metals from the water. The patented method retains metals as well as oils inside particle retention filters.

"We use two different filter media, both environmentally friendly, and they can be used one by one or together in a serial package. Thereafter, the water is recirculated into the processor and the procedure repeats," says Suhr.

Spreading the benefits

The Solventic process refines sewage sludge down to highly nutritive content that becomes quality fertilizer. The process can purify material from mines, highway gravel, mud from polluted rivers or old landfills so thoroughly that the cleansed earth can often be used as coverage for planting or as filling soil for repairing damaged areas.

"Our equipment minimises the effects of environmental pollutants on Mother Earth," says Suhr. "Perhaps a licensing of our patents might facilitate their utilisation in faraway countries. We are studying how to best spread the benefits of our process so that it can benefit the world."

The unique mixing and spreading features of the patented mixing process can be used in other areas as well – premixing instead of dumping into a recipient – distribute CaCO₃ to give a higher pH in lakes, rivers and marshland. Mixing of powder into a liquid phase at many other types of applications in different industrial segments.

Chinese power order to Alfa Laval

Alfa Laval – a world leader in heat transfer, centrifugal separation and fluid handling – has received an order of about SEK 60 million for plate heat exchangers to cool equipment by means of seawater, in two new nuclear power reactors in China. Delivery will take place during 2007 and early 2008.

The order consists of eight plate heat exchangers to be installed in a central cooling system. Alfa Laval in China is involved in a number of projects relating to oil, gas and power production. In 2005 the energy sector amounted to about 35 per cent of the company's business in the country.

Alfa Laval is a leading global provider of specialized products and engineering solutions based on its key technologies of heat transfer, separation and fluid handling.

The company's equipment, systems and services are dedicated to assisting customers in optimizing the performance of their processes. The solutions help them to heat, cool, separate and transport products in industries that produce food and beverages, chemicals and petrochemicals, pharmaceuticals, starch, sugar and ethanol. Alfa Laval's products are also used in power plants, aboard ships, in the mechanical engineering industry, in the mining industry and for wastewater treatment, as well as for comfort climate and refrigeration applications.

Alfa Laval's worldwide organization works closely with customers in nearly 100 countries to help them stay ahead in the global arena. Alfa Laval is listed on the Stockholm Exchange and, in 2005, posted annual sales of about SEK 16.5 billion (approx. 1.8 billion euros). The company has some 9,800 employees.

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When pipe quality matters



Energising the indoor climate

• "Our job is to remove anything undesirable from the air – and add what is missing. This is how we create healthy and energising indoor climate, where the focus is on the occupants and well-being is a prime concern," says Mikael Karlsmyr, public relations manager for Swegon.

Karlsmyr says Swegon's mission is to provide a good indoor climate with the emphasis on temperature and air quality, but without draughts or background noise. "In fact, our ventilation systems should not be noticed at all by the occupants," he says. "With fresh air, occupants will feel more at ease and remain alert far longer. In short, our concern is for those who spend time indoors, and it is for them we want to create comfortable temperatures and air flows with clean air and energy content in the air."

Swegon AB has a history going back 50 years. Today, the company is part of the Latour Group which is represented on the Swedish Stock Exchange and of which ventilation is one of three business areas. Swegon has an annual turnover of €135m and 800 employees.

Three specialised factories

Swegon is based in Sweden where its air handling units chilled beams and air diffusers are manufactured at three factories. The main factory is in Kvänum where the headquarters are also situated. The other factories are located in Arvika and Tomelilla. Karlsmyr points out that each factory is specialised with its own R&D department in order to create the best possible ventilation solutions to cater for different client demands.

Asked about the range of air handling units produced by Swegon, Karlsmyr lays stress on their GOLD one-piece unit which now represents 80 per cent of units sold. This is a pioneer air-handling unit first introduced in 1994 which has proved to be highly successful in all types of buildings ranging from private homes to specialised industries. "This one-piece air handling unit includes supply air and exhaust air filters, a heat recovery section, direct-driven supply air and exhaust air fans as well as inte-

grated control equipment and heat exchangers. Air flows are up to 8m³ per second."

Prestigious London order

Karlsmyr says Swegon's GOLD ventilation units are being used in a major London building project. "The building contractor for an imposing office building at the fashionable London address, 30 St Mary Axe, recently placed an order for 180 GOLD ventilation units. This order is an important breakthrough for Swegon which has devoted considerable effort towards the marketing of decentralised ventilation. This involves the selection of several smaller ventilation units instead of a single large unit for ventilating the whole building. The advantage of smaller units is that they can be installed in spaces that otherwise would not be put to use, thus sparing the owner the costs for special fan rooms. Small ventilation units are also more power-efficient."

Karlsmyr says that, apart from Sweden, Swegon has its own sales companies in Finland, Norway, Denmark, Germany, France, Switzerland, Austria, Poland and Great Britain, as well as distributors in most other European countries. "The Nordic countries represent our leading markets followed by Poland and Great Britain. Russia is also an up-and-coming market for us."

Air Academy

Karlsmyr says that Swegon has furthermore taken on the role of providing know-how about indoor ventilation to architects and those working in the building trade. "Our Air Academy sets up seminars and provides all those who need information about indoor ventilation concerning the latest research and development in this area," he says.

Swegon recorded a 25 per cent volume increase on the European market last year, and has recently invested €2m in its Kvänum plant for the further development of decentralised ventilation systems. "Everything is going well for the company and we intend to be even more aggressive on the European market during the coming years," says Karlsmyr

J E H

Air force: Swegon has been improving ventilation for more than 50 years



Sky's the limit for public transit

• Is this the future of urban transportation? SkyCab is an environmentally-friendly, intelligent and automatic personal rapid transit (PRT) system being developed by a network of Swedish industry, academia and the public sector.

The first PRT test track in Sweden has been built in the city of Hofors, around €30m has been invested in PRT in the country, and SkyCab is now attracting international attention.

The all-weather system runs four to five metres above the ground and each SkyCab has room for four passengers. With no timetable restrictions, passengers are whisked in their own vehicle to their desired station at speeds of around 40kmh, reducing urban travelling times by about half.

A study by the Royal Institute of Technology in Stockholm (KTH) has shown that SkyCab's emissions of CO₂ are 50 times lower than those of a car, and if the system is powered by "green" electricity, 1,800 times lower. SkyCab uses one quarter of the energy per person/kilometre as a car, and 50 per cent compared with a bus.

Åke Åredal, managing director of SkyCab, who came up with the concept while working on an idea for a theme park in the Mediterranean, says: "We are not a car, we are not a train, we are something in between. There are five goals we are trying to achieve: attractiveness, availability, security (technical and for passengers), environmental friendliness, and cost efficiency."

Åredal explains that a person wishing to travel with SkyCab pushes a button while approaching a station. When they get there, the SkyCab is ready and preprogrammed to take them to their destination. "The vehicle is waiting for you at the station, you get in, you confirm your trip, then you move off," he says.

SkyCab is part of a research, development

and demonstration project run by Banverket, the authority responsible for rail travel in Sweden, called Gröna Tåget, or the Green Train. "Trains runs from A to B, but you need a smaller feeder system to transport passengers to and from the rail station," says Åredal. "When you arrive at station B you jump into a smaller vehicle, a SkyCab, and travel further in the local community. Banverket sees that SkyCab will increase the demand for railway travel."

Åredal says SkyCab complements the railway network and increases availability for travellers around railway stations. "SkyCab is also a potential communication solution for both communications-intensive areas like airports and universities, and smaller areas with fewer possibilities for public transit."

SkyCab, which is part of the Swedish government's global Sustainable City programme, is one of many PRT projects under way around the world, but is being seen as one of the more feasible solutions. Two delegations from China have visited Hofors on a fact-finding mission, and SkyCab representatives have made a return visit as part of a Swedish state delegation to China.

Part of the plan for a SkyCab network near Stockholm's Arlanda Airport includes a stunning design for an integrated railway and SkyCab station (pictured). Åredal says that when he gave the designers their brief, he set the bar high. "I told them it should be in the same class as the Sydney Opera House," he says. "I wanted an unforgettable design." It is a result of participation in Sweden's 2005 Design Year, initiated by the government, and the project was shortlisted for the Design Year prize.

Åredal says SkyCab is working with a dozen Swedish universities, and has the support of a complete industrial group to supply the system. "We have very good market and business conditions to go further in the process demonstrating the SkyCab system," he says.





Clockwise, from top: the planned SkyCab Integration Centre in Hofors; map of the proposed SkyCab network for Stockholm's Arlanda Airport, the international code for which is ARN - arn is also old Swedish for "eagle"; an artist's impression of SkyCab by the Turning Torso in Malmö; "The Eagle", the design vision for a combined railway/SkyCab station at Märsta-Arlanda



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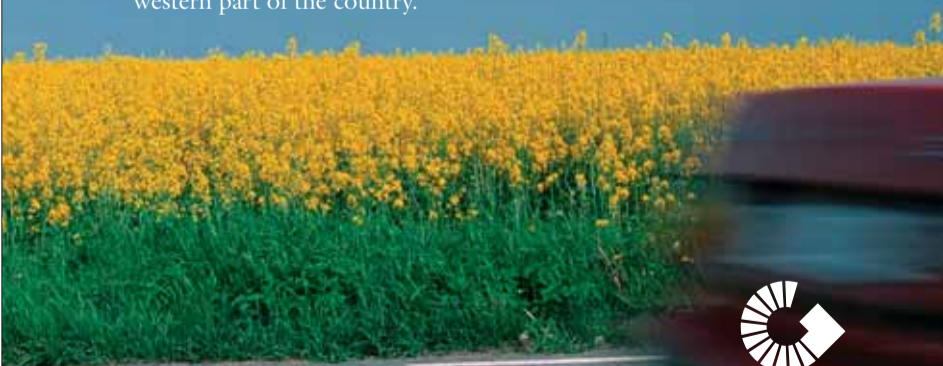
For several years now, public and private actors in West Sweden have worked successfully with developing the possibilities of biomethane as a vehicle fuel. Through the Biogas West project, we have created positive results through all stages of the biomethane life cycle.

RAW MATERIAL Biomass from sewage, household waste and the food industry are being used as raw material. There is also great potential for producing biomethane using agricultural raw material. Forestry waste products will be useful in future thermal gasification plants.


PRODUCTION There are seven plants in the region, producing biomethane for vehicles. Today, these plants can supply about 10 000 cars with fuel every year.

DISTRIBUTION Today, there are 60 biomethane filling stations throughout Sweden. More than a third of them can be found in West Sweden.

VEHICLES More than half of the gas vehicles in Sweden run in the western part of the country.

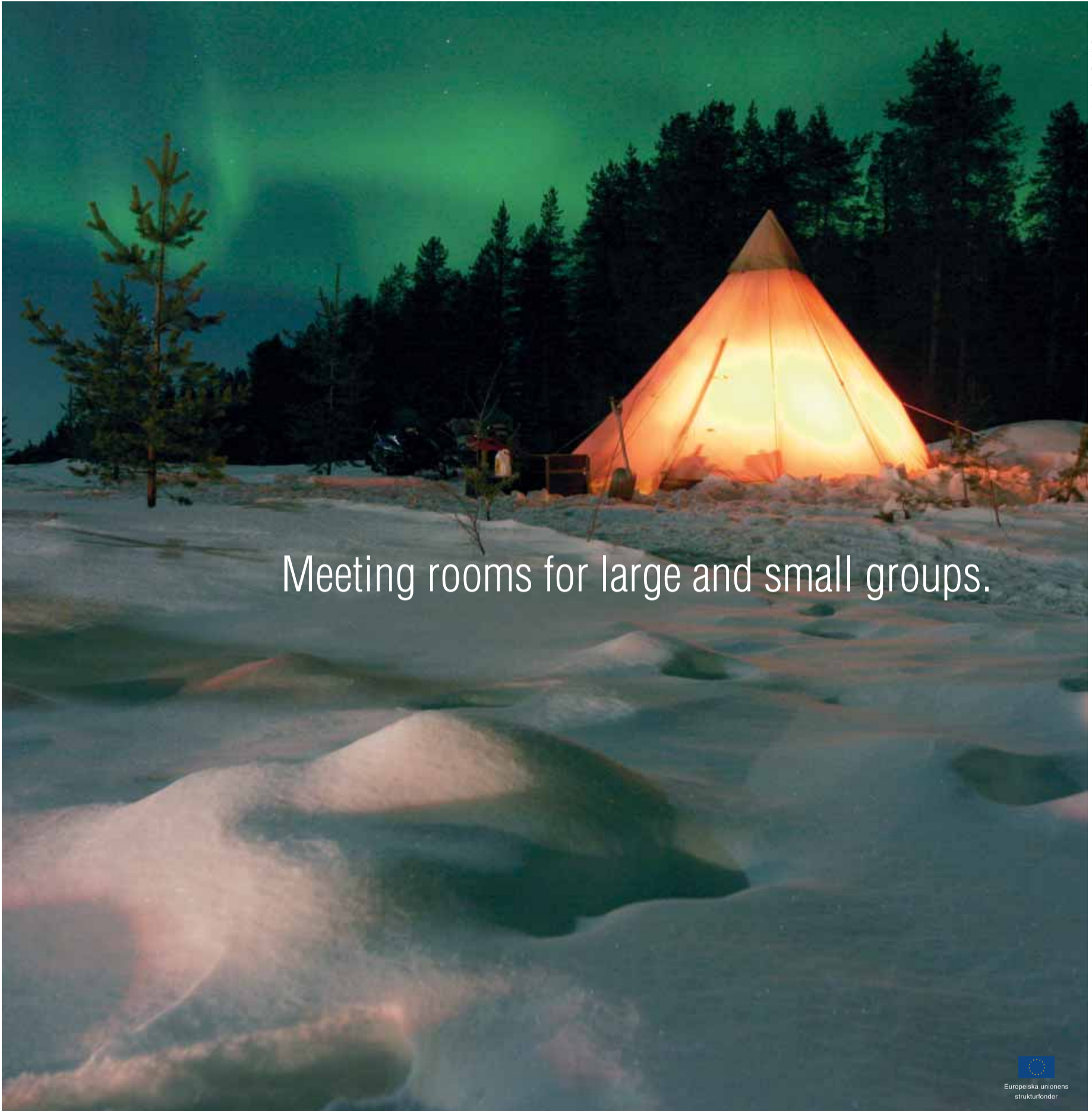


Biogas West purpose is to create a new industry within the field of production, distribution and use of biomethane as vehicle fuel. Participants in the Biogas West project are: Volvo Cars, Volvo Group, Hertz, The Swedish National Road Administration Region West, The Federation of Swedish Farmers (LRF), IVL, energy and gas companies, organizations and several municipalities. The project is supported by Region Västra Götaland, the EU project BiogasMax and the Swedish Environmental Protection Agency (the climate investment programme). Business Region Göteborg is the project manager. For further information, visit www.brgbiogas.com



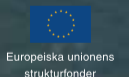
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More than meeting expectations

• From dog-sledding in the arctic north to panoramic views from the top of one of Europe's tallest buildings in the far south, Sweden is able to offer a unique range of attractions to the meetings, incentives, conferences and events (Mice) visitor.

The country is one of Europe's top Mice destinations, and the market is growing at a healthy five per cent per year, generating about €3,6bn for the economy.

"Sweden has every chance of arranging successful meetings and giving the visitors a unique, professional and memorable experience," says Thomas Brühl, managing director of VisitSweden (formerly the Swedish Travel and Tourism Council). "The meet industry in Sweden – including congresses and incentive travels – is very important for Sweden, and we were rated number 11 among countries for congresses, with 124 international congresses in 2004. Swedish incoming operators and PCOs are reporting an increase for incentive travels every year, especially in and around Stockholm and Swedish Lapland."

In a sector where delegates today demand much more than just a hotel bed and a guided tour after the day's business, Brühl says Sweden has something extra to offer. "Sweden offers an endless bounty of natural luxuries, such as clean air, free open spaces, fresh water and vast areas of wilderness and breathtaking scenery. Sweden is also highly modern, well organised, sophisticated, friendly, creative and safe society with high language skills, where professional affairs are managed swiftly, amiably and efficiently."

VisitSweden works together with the cities of Göteborg, Stockholm and Malmö and the northern region of Lapland to promote the country as a Mice destination on selected foreign markets, including the UK, Germany, France, Italy, Spain, Norway and the US. The marketing efforts are made mainly towards incentive houses and agents through selected fairs and workshops, supplemented by relationship marketing through VisitSweden's own Mice managers.

"The number of leads is increasing to VisitSweden and its partners in Sweden, and we are looking forward to the expected increase of five per cent," says Brühl.

VisitSweden's main target group is the "Global Traveller", within which there are four segments: Corporate Meetings (including Mice), Active Families, Dinks (Double Income, No Kids) and Whops (Whealthy Healthy Older People). "The leisure travel segments are important for the Corporate Meetings segment because of the impact made for Sweden for the leisure travellers, who are mostly the same people making corporate travel decisions," says Brühl.

Stockholm shines

Sweden's capital, which consistently ranks among the top ten international congress locations, had a record year last year with more than 300,000 bed nights for the association market.

"We already have confirmed more than 30 big conferences for 2007-2011, so the future looks very good," says Peter Lindqvist, director of Congress Stockholm, the city's official convention bureau.

Among last year's events was the European Society of Cardiology's congress, Europe's biggest with about 24,000 delegates, who were in Stockholm for the third time in ten years. Next year the European Respiratory Society brings 16,000 people to the city. "They are also coming back for the third time because we are one of the few cities that can handle these massive conferences. We are famous for that," says Lindqvist.

Within the incentive and corporate meetings sector, Stockholm has a marketing focus

on Germany, UK, Italy, France, and the US, and Lindqvist says they have seen a significant increase in interest from these countries.

He says the city has an enviable mix of venues, facilities and attractions for the business traveller.

"We have the archipelago, we have culture, we are a trendy city, and we have everything from the latest designer hotels to small inns, plus big hotels where you can hold meetings downtown. Last but not least we have more and more direct flights within Europe."

Stockholmsmässan (Stockholm International Fairs) is one of the few centres in Europe that can hold conferences for more than 20,000 people, and in the heart of downtown there is the City Conference Centre which can host up to 2,000. "For big meetings we have an excellent capacity of hotel rooms downtown," says Lindqvist. "There are about 6,000 hotel rooms within easy reach from the Central Station. In Stockholm as a whole there are 10,000-12,000 and if you are prepared to go out a bit we have about 24,000 hotel rooms in the area. So the hotel situation is very good, and the standard is very high."

Lindqvist says that a reputation that has long dogged Stockholm no longer holds true. "Professional buyers now know Stockholm isn't so expensive any more," he says. "It is not more expensive than other major cities in Europe, and is actually ranked about 21st in the world."

Best of the west

On the other side of the country, in Göteborg, the city is capitalising on its reputation for world-leading research and development in its efforts to attract Mice customers.

"That is crucial for us," says Henrik von Arnold, director of Göteborg Convention Bureau.

"We have about 400 Meeting Ambassadors at the universities working for us, individuals who lead in their fields of research who do the work of attracting associations. They can show the world what is happening here."

Göteborg has traditionally put its focus on the association market, and the city attracts about 40 international association meetings a year with a delegate number of over 200. Now efforts are also being invested in the corporate meetings market. "We are newcomers to this segment – having started in 2003 – but we are on the way to attracting a lot of corporate meetings," says von Arnold.

He says that Göteborg's easy logistics are a key attraction for the Mice market. "It is not time consuming with transport, you do not need shuttle buses to get people around – they can walk." A doubling of direct connections to the city's airport from across Europe has further increased accessibility.

Also important is the city's "spirit", says von Arnold. "This feeling of being laid back while still being efficient. We have a good infrastructure and very good cooperation between the city authorities, both the meetings industry and other industry, and the universities, and people say when they leave that they can feel this cooperation, and they feel that they really want them, they are important for us. Everyone has hotels and good meeting facilities, but you really have to get across that you really want them, and people get that."

Göteborg boasts one of the top five Mice facilities in Europe with the Göteborg Convention Centre, which can host 9,000 people. "It is not just right in the heart of the city, but it is also a state-of-the-art meeting facility," says von Arnold. Next to GCC stands the Hotel Gothia Towers, to which a third tower will be added, making it the biggest hotel in western Europe at 1,200 rooms.

Southern hospitality

Skåne, Sweden's southernmost province, is an up-and-coming region for Mice events and boasts some exceptional facilities, from the ultra-modern to the historical. The newest and most sought-after locale is found at the top of Turning Torso. The 53rd and 54th floors, 179m above sea level, with panoramic views across the Öresund Strait to Denmark and beyond, can now be hired for corporate events. It is said to be southern Sweden's most expensive meeting place, but is nonetheless heavily booked several years into the future.

"This venue is unmatched in the whole of Scandinavia," says Thomas Johansson, Mice marketing manager at Position Skåne. "It has the best view in Malmö, and is for sure one of the best locations."

Skåne's location, linked to Denmark by the Öresund Bridge, gives it access to both Swedish and Danish markets. "It is a bonus to be able to offer two locations in one, and that's how we brand it: one destination, two countries," says Johansson. "We get customers from two directions."

Its proximity to Copenhagen means the city of Malmö will be co-hosting one of the world's largest conventions in June. More than 20,000 delegates from around the world are expected in the two cities for the Rotary International Convention held over four days.

The city of Helsingborg is also attracting international events, including in September this year the International Culinary Tourism Association's symposium. "It is the first time this type of conference has been organized outside US, and they chose Skåne due to the strong traditions and reputation in the culinary area," says Johansson.

"In Skåne you have excellent possibilities for conferences and incentives, with a completely different programme from big cities. What people want to do is explore the nature, the castles, experience the food from some of the best Swedish chefs, and we have a wide range of facilities for all size events from castles to the top of the Turning Torso."

Snow business

Swedish Lapland is one of Sweden's fastest-growing Mice destinations, offering a once-in-a-lifetime experience to business travellers.

Microsoft and a major Italian bank are among the companies to have organised conferences in this area which straddles the Arctic Circle. Attendees can take part in far from run-of-the-mill activities like dog-sledding, snowmobiling, dining on ice, and trips on working icebreakers. Facilities are the match of those in any major city; Pite Havsbad has the greatest conference capacity in the Nordic region, and at the other end of the scale you can get back to basics with the boss in a log cabin in the high fells.

"When you go with a conference group, as I know from my own experience, the thing people remember is not what they discussed, not the agenda or anything like that, but the things you did," says Jan-Erik Jaensson, MD of the tourism company Norrbotten/Lapland, which promotes the region. "I see it as more of a teambuilding activity. And here we can offer something that is quite unique in the world. If you want to you can just go outside and listen to the silence, and in the winter you can look at the darkness, which you can't see in most of Europe. How many people have listened to silence and looked at darkness where you can see all the stars and the moon? And it's the opposite in summer with the mid-night sun when it is never dark – you can do a walking safari starting at midnight, you can play golf, you can sail in the wonderful archipelago. That is the type of experience that you never forget."



PHOTO: KJELL HOLMNER/GÖTEBORG & CO

PHOTO: EDU VAN GELDER

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Steady rise for tourism industry

Hotel comeback

• With six, eight and nine per cent increases respectively for Stockholm, Göteborg and Malmö, there are no echoes of the 61 per cent occupancy rates that pestered the Swedish hotel business in 2003.

Overnight stays and prices at Sweden's major hotels, ones which also have dining facilities in combination with accommodations, have increased for the third quarter in a row. With 92,000 rooms and some 28,000 employees in the country's major cities, Sweden's hotels are showing a turnover of €2.7 billion nowadays, and two thirds of that is coming from business travel and conferences.

While he says he would not call it a "boom" in the hotel business, Göran Granhed, the trade financial analyst with the Swedish Hotel and Restaurant Association (SHR), reports that the increase probably bring around 6 per cent higher turnover. Other sources report about a 4.3 per cent increase in prices, and Granhed concludes that all these improvements are following, albeit afterward, the hikes in Sweden's stock market and GNP.

The first signs of recovery came when increases in January of 8 percent were followed by modest hikes in February and a resounding 13 per cent in March.

He expects that the final figures will show that 2006 has been a "very good year." Even though it won't reach the gleaming 74 per cent occupancy that the "golden millennium" of 2000 achieved, Granhed reckons that 68-69 per cent occupancy should be relieving.

• Consistently each month for the last seven quarters, income from tourists in Sweden has increased by 20 per cent or more, and for the current year, projections point to a total cash influx of €6.7 billion.

Further statistics from Sweden's Tourism Research Institute report that commercial guest nights increased during the first quarter by 5.2 per cent.

Most branch experts believe that low price airline services should receive most of the praise for the boost in foreign incoming tourists. Air travel that brought foreigners to Sweden increased by 9 per cent, and commercial guest nights increased by 5.3 per cent at a time when hotel prices rose by 4.3 per cent.

Pristine natural attractions

Certainly, Sweden's unspoiled nature along with good access to these wilderness areas has continued attracting repeat visits. Recent decades' investments to improve tourism on a local level are also beginning to show their worth by promoting undiscovered sights and adventures to the international audiences.

In the major cities, some of Sweden's favourite tourist attractions are the multi-purpose family entertainment and amusement park, Liseberg, in the centre of Göteborg, and in Stockholm both the Wasa ship museum and Junibacken, the Astrid Lindgren theme park (she's remembered worldwide for her children's books with characters like Pippi Longstocking).

Liseberg attracts 3.2 million guests annually, with up to 15 per cent tourists in summer months. Of around 900,000 who marvel at historic remnants of the resurfaced 16th century "Wasa" man-o-war, 70 per cent are foreigners. By comparison, tourists account for 20 per cent of the 400,000 at Junibacken, also in Stockholm. The wide popularity of Astrid Lindgren's books is accredited for this heavy total from abroad. The park has some 30 languages on its web site



Pippi Longstocking and friends at Stockholm's Junibacken

alone and a large number are spoken by guides on tours through the facility.

Advertising pays off

Nearness to ports of entry and rapid accessibility, both features of the Göteborg and Stockholm sites, actually doesn't seem to be the single determining factor. While being somewhat the Stockholm equivalents of Liseberg as a draw for amusement, concerts, etc., the Skansen and Gröna Lund parks report lower percentages of international visitors, even though their overall annual totals through the turnstiles are likewise increasing. Some believe that promoting abroad might be one reason for this.

According to Ossian Stiernstrand, MD of Sweden's Tourism Research Institute, the nation's treasury will reap over €3 billion in taxes this year from the tourism related industry. However, investments from the government to promote tourism haven't increased or expanded in decades, and projects with support from the private sector have been the overwhelming reason that Sweden as a tourism destination has been exposed to international prospects.

On the balance sheet, incoming tourism still outweighs expenditures by Swedish travellers who spend their crowns outside the country. This year's figure shows less than half a million euros difference, although despite this, Stiernstrand is satisfied to see the decreasing gap.

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Here comes the sun

• The longest, coldest winter in living memory in many parts of Sweden has left the population more than ready for the warmth of summer.

Besides the usual joys of the great outdoors like golfing under the midnight sun in the far north and sailing in the stunning archipelagoes, summer 2006 boasts a long list of cultural, musical and sporting events around the country. From international tennis in Båstad – Sweden's answer to St Tropez – to the island of Gotland's famous Medieval Week, there is something for everyone. What follows is a little taster of this season's happenings.

July 1-9

Music at Lake Siljan

"Music on Lake Siljan" has struck a chord in the first week of July every summer since 1969. This renowned music festival on the shores of Lake Siljan in Dalarna has something for everyone. www.musikvidsiljan.se

Starting on July 2

Gotland Runt

Sandhamn, Stockholm/Gotland

International sailing competition between approx. 400 contestants from all over Europe. www.gotlandrunt.se

July 8-16

Synsam Swedish Open

Båstad, Skåne

Annual International tennis tournament in Southern Sweden's summer party village no 1. A favourite among many of the world's top players. www.swedishopen.org



July 14

Victoriadagen

Borgholm, Öland

Celebrations to mark Crown Princess Victoria's birthday on the island of Öland. The royal family attends this regal event. www.victoriadagen.nu

July 18-22 (prel)

Stockholm Jazz Festival

Stockholm

International Jazz Festival with blues, soul, funk and Latin music by international and Swedish artists. www.stockholmjazz.com

July 25

DN Galan

Stockholm, Stadion

The DN Galan is part of IAAF Super Grand Prix and has been the leading international track and field event in Sweden since it started in 1967. Sweden's largest annual sporting event. www.dngalan.com

July 31-August 6

Gay Pride

Stockholm, Tantolunden at Liljeholmsbron

The largest Gay Pride Festival in the Nordic countries takes place in central Stockholm. A 1 week event filled with seminars, workshops, concerts, theatres, attractions, etc. www.stockholmpride.org



August 12-19

Dalhalla Opera Festival

On opera performance in Dalhalla is something outstanding, an experience you will never forget. The glorious natural surroundings are part of the stage setting. Above the massive walls of the rock, horizons are formed by the irregular line of spruce and pine. Opera in Dalhalla is mostly without any amplification, which is quite unique for an outdoor arena. www.dalhalla.se

August 18-25

The Malmö Festival

Malmö, Skåne

Experience a gigantic party with music, theater, specially designed fireworks, sport events, amusement parks and handicrafts. www.malmofestivalen.nu

August 27

Tjejmilen

Stockholm, Gärdet

Over 30,000 female runners will run 6 miles around parts of Stockholm. www.tjejmilen.se



August 6-13

The 19th European Athletics Championships

Göteborg

A world-class sporting event. Major sporting stars will be competing for medals at Ullevi Stadium. In the centre, there will be the City Festival Göteborgskalaset with all kinds of performers and entertainment. www.goteborg.com

August 6-13

Medieval Week on Gotland

Visby, Gotland

The Medieval Week on Gotland is filled with light and happiness. You will find markets, people wearing medieval attire, Pilgrim walks, music, contests and games. www.medeltidsveckan.com



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www.sj.se

Jansson stakes all on crystal clear vision

• With Orrefors and Kosta Boda in his portfolio, entrepreneur Torsten Jansson and his wife and family have replanted their home to the Kingdom of Crystal for a make-or-break venture.

He wants to succeed where no man has succeeded recently, or at least nobody's been especially adept at it for a few decades: profiting in the glassblowing district in Småland. He's a Göteborg native who, since he can't convince his beloved Liseberg to move east to the south central Swedish woods, plans to build his own activity park along with hotels, spas, restaurants, pubs and, certainly, crystal glass boutiques.

Branch observers thought that they heard the Danish owners, Royal Scandinavia, breathe sighs of relief when his firm, New Wave Group, paid €2.7 million for the world famous glass factories. For over a decade, the Swedish crystal art businesses have been draining profits from their sales of Scandinavian design articles made in other sectors within the Nordic countries.

Higher stakes

To the delight of officials in Lessebo Municipality, where Kosta is located, Jansson's next surprise was to announce that he would raise his investment by up to €20 million. Starting with a 90-room hotel and spa at Kosta, his plans call for freshening up the estate-like appearance of historic Orrefors by revamping the "glass factory" atmosphere for close encounter visitor experiences. In addition, 35 rooms, two restaurants and a pub will be built.

He's crystal clear about the tourists he wants to attract, and he's prioritising business from upscale Asian travellers. Despite money problems, Orrefors' and Kosta Boda's product recognition around the world is being counted on by Jansson to draw guests.

Hands-on sales idea

"Developing tourism will do a lot of good for the crystal glass business," he told reporters from Veckans Affärer. "People can think that our articles are expensive, but when they come here and experience how they're produced on the spot, they'll form an entirely different opinion."

The first phases with hotels, etc., are planned to be completed for the 2007 tourist season. For the 60 hectare project that will be needed for the activity and amusement park, he's hoping to distribute expense by taking in new investors. Jansson, whose principle business has been marketing image clothing with company logotypes, also has some 11 per cent stock holdings in JC – a profitable and expanding international clothing store chain.

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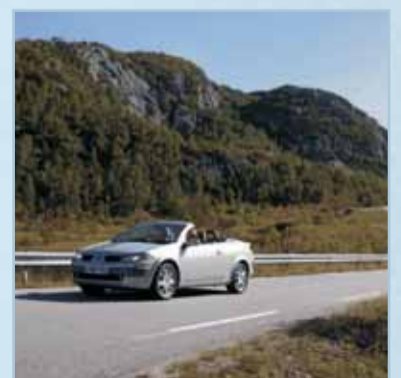
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