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Sweden - simply the best?

Sweden is often held up as a model when it comes to renewable energy. The country will have no problem meeting its Kyoto targets. But underneath this green shine plenty of problems lurk. Prices are high, the future of nuclear is uncertain, gas imports are held up, the transport infrastructure is obsolete, and wind power almost nonexistent.

| by *Reiner Gatermann*

The praise lavished on Sweden by Nobuo Tanaka, Executive Director of the International Energy Agency (IEA), on the handing over of the IEA's country report to the Minister for Enterprise and Energy, Maud Olofsson, could be described as excessive. So much recognition for work accomplished, so many Swedish decisions held up as exemplary for other governments, was enough to embarrass a number of civil servants and politicians. But one government advisor well-versed in such matters managed to retain his composure. 'Mr Tanaka only wants to flatter us so he can fire off his salvo of criticism more elegantly while we are still basking in his effusive praise. He is, after all, a very skilled diplomat.' And sure enough the attack duly came, a boot to the Achilles' heel of Sweden's energy policy: 'Clarify the conditions for the use of existing and

future nuclear power capacity, with due consideration to electricity prices, climate change mitigation and security of energy supply.'

From producers and traders to commercial and private customers, the energy sector's view on the government's energy policy is easy to sum up: 'Sweden's energy policy? Does it have one?' Well, Sweden does have an excellent position in many areas of energy supply. Sweden has extensive hydropower, providing approximately half the electricity consumed, and large volumes of valuable waste from the forestry and wood-processing industries. Three other aspects of Sweden's energy policy can be attributed to political decisions. Sweden built twelve nuclear reactors between 1971 and 1985. The two Barsebäck reactors on the west coast were

decommissioned in 1999 and 2005: partly as a result of a political agreement reached in 1997 between the Social Democrats, the Miljöpartiet-De Gröna (the Greens) and the Centre Party, and partly because of the complaints from nearby nuclear-free Denmark.

The second decision was to replace interior heating, which was run primarily on oil, with district heating systems run on combustible waste. This often went hand in hand with the installment of home insulation. These measures were supported by generous subsidies, including for heat pumps, which are now fitted in approximately 80% of newly built family homes, with over 60% using geothermal energy. Overall, a 70% reduction in greenhouse gas emissions in the residential sector has been achieved since 1990.



Maintenance personnel having their radiation level monitored at the Forsmark nuclear power plant, Sweden. Photo: AFP/Stringer



Photo: Peter Lilja/Getty Images



Fleet race with the closed down nuclear powerstation in Barseback behind. Photo: Sven Nackstrand/AFP/Getty Images

The third decision was to deregulate the electricity market and to subsequently introduce the Green Certificate scheme to promote the use of “green energy”. The IEA’s report shows that Sweden, together with Switzerland, now has the best result in terms of CO₂ emissions per unit of GDP and per capita. Since 1999, emissions of greenhouse gases (GHG) have shown a declining trend.

Taxes |

The government has adopted tax-based measures in an effort to reduce GHG emissions. Since 2005, the government has helped businesses in the forestry and paper industry, the chemical industry and the iron and steel industry to undertake energy-saving measures. The programme is voluntary but has been widely embraced. To encourage energy savings in the transport sector, the government made changes to the tax system in 2006. Up to that point, taxation was based on the weight of the vehicle; now CO₂ emissions are the determining factor.

In addition, buyers of low-emission cars receive from the state a cash contribution of SEK 10,000 (over 1,000). Since the new system was introduced, the proportion of low-emission cars on the road has risen considerably. In the first six months of 2008, the percentage of environmentally friendly cars increased by 89% to 31% of total sales. However, Sweden has turned to more environmentally friendly vehicles very late in the day. Of a total fleet of approximately 4.4 million cars, only 9% are diesel vehicles and an extremely modest 6% operate on

alternative fuels. In fact, Sweden’s car fleet is still amongst the oldest in the EU. Of all the EU member states, the cars in Sweden have the highest average petrol consumption. And the road and railway infrastructure are both in a poor state.

Another project with a strong impact on energy policy is the “Green Certificate” scheme. This requires electricity suppliers to buy a certain percentage of renewable energy in the form of tradeable certificates which are issued to producers of renewable electricity. In 2003, when the scheme was introduced, this percentage was 7.4%, now it is 16%. Back then, the end consumer was charged 3 to 4 öre per kWh (0.3 to 0.4 eurocents); today it is approximately 8 öre (0.85 eurocents) and this will soon rise to 10 öre (110 eurocents). To provide the industry with a degree of certainty, the scheme has been extended to 2030. Prior to 2003, the State supported “green electricity” through direct subsidies. Now it’s the end consumer who must finance it.

If an international comparison of energy and emission data were carried out, Sweden would no doubt come out relatively well, and the country will not have any problem meeting its Kyoto targets. Nevertheless, domestically, when it comes to energy policy, widespread dissatisfaction prevails. According to one widely held view in industry, everything started to go wrong in 1980 with the referendum on the future of nuclear power. ‘It acted like a concrete block, essentially killing off debate’, says Birgitta Resvik, spokesperson on Climate and Energy

Policy for the Confederation of Swedish Enterprise (Svenskt Näringsliv). Voters opted to phase out nuclear power as far as possible and to stop any further expansion. In addition, all nuclear power plants would have to be brought into the hands of the state. In reality, Sweden kept building more reactors until twelve were in operation.

Until 1997, nothing much happened in energy policy, except for the decision to deregulate, but in 1997, the governing Social Democrats, the Left Party and the Centre Party decided to adopt a new policy: no more nuclear power in Sweden by the year 2010. Installations were to be shut down as long as sufficient replacement electricity could be generated and no negative impact on economic growth would be felt. The shutdown of the two Barsebäck reactors was also agreed.

Since then, opinion has started to shift. Increasingly it is felt that Sweden cannot do without nuclear power. The closure of further reactors is currently off the table. When the right-leaning four-party coalition replaced the Social Democrats in the autumn of 2006, it decided there would be no more closures nor approvals to build new facilities in the four-year legislative period. The expansion of existing nuclear power plants was, however, tacitly approved. The capacity shortfall caused by the shutdown of the two Barsebäck reactors is addressed by modernising the remaining ten reactors. More than SEK 25 billion (€2.64 billion) is being invested to increase capacity by 9 TWh by 2012.

Eon and Statkraft separate – and merge

German company Eon AG is to become the sole owner of Sweden's second-largest electricity producer, Eon Sverige AB, by taking over the 44.6% share previously held by Norwegian supplier Statkraft AS for €4.5 billion. The deal is expected to be sealed by the end of the year. Statkraft will be paid 'in kind'. It will obtain from Eon AG 39 hydropower plants and five district heating plants in Sweden, two gas power plants in Germany with a capacity of 917 MW, shares in two 16 MW biomass plants and 11 hydropower plants in Germany and a 56 MW power plant in Wales. These assets are together valued at €2.32 billion. For the remaining €2.18 billion Statkraft will take an approximate 2.5% stake in Eon AG, making Statkraft the largest industrial shareholder in Eon and giving the Norwegians a position on the Eon supervisory board for their chief executive Bård Mikkelsen. Both sides see nothing but advantages in the agreement. With the acquisition of the hydropower plants, the Norwegians are taking a crucial step towards their stated goal of becoming

Europe's largest producer of renewable energy. They will also strengthen their position in Germany, where Statkraft only had two gas-fired power plants.

The Germans will be solely in charge of their Swedish subsidiary, which owns two nuclear power plants to which Statkraft does not assign a high priority. Eon has already begun a far-reaching series of investments in Sweden. It has set aside €6 billion from the years 2006 to 2013. €1.9 billion is for improvements to the transmission system, including laying cables in the ground and introducing intelligent meters. €530 million will be used to modernise hydropower plants. Approximately €580 million is earmarked for expanding wind power, although this will be mainly spent in Denmark on the Danish wind farm Roedsand II. Last but not least, €1.5 billion will be spent on expanding nuclear power in Sweden. The Swedish trading office will be moved to Düsseldorf. Eon did have to put aside plans for importing natural gas and LNG into Sweden.

Public opinion is heavily divided on the nuclear issue. Industry is calling on politicians not to dodge the issue any longer, pointing out that the natural service life of the reactors brought online in the 1970s will soon come to an end. 'We need a policy as soon as possible that sets out how things ought to be. Politicians must not act as if nothing has changed since 1980,' demands Resvik.

But the political parties hold strongly different views on nuclear power. The Liberals are for, the Greens against. The Social Democrats are maintaining a low profile; the party is split. The Left Party is tending towards the use of existing nuclear facilities until the end of their service life – a view largely shared by the Christian Democrats and the conservatives. A key role is played by the Centre party, which demonstrates a certain pragmatism.

Wind picking up |

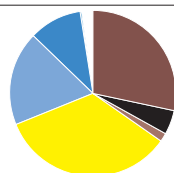
It has been less than three years since the Swedish parties and the energy industry discovered wind power. Until then, only hobby farmers and people with an interest in the environment were involved. That wind power currently only contributes 1.4 TWh to the power supply, i.e. less than 1%, says enough. But things look set to change dramatically. The government is aiming to increase production to 10 TWh by 2015. This is not enough for the Energy Market Inspectorate (Energimyndigheten), which is demanding that the bar be raised to 30 TWh by 2025, to meet EU requirements. The state operator of the distribution network, Svenska Kraftnät, fears that such expansion will bring about transfer problems.

Wind power has become an attractive investment proposition. According to business magazine 'Affärsvärlden', plans to

the value of approximately SEK 200 billion (€21.14 billion) are on the cards. Vattenfall alone is planning to invest SEK 41 billion (€4.3 billion) in the Nordic region. Recently, it brought into operation the Lillgrund wind farm, the country's largest offshore facility with 48 turbines near the Öresund bridge between Sweden and Denmark, an investment of €190 million. It took almost ten years to overcome all the obstacles put up by authorities and objections from citizens. 'The future is looking very bright for wind power,' says Mathias Rapp, director of the sector organisation Svensk Vindkraft. The government's decision to extend the Green Certificate scheme until 2030 has prompted a huge wave of investment. Various alliances are being formed, such as between utility companies and forestry operators. Cooperation on a grand scale between two of the largest forestry operators (Sveaskog

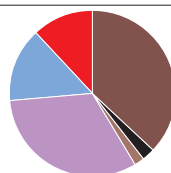
Close up

Supply and demand in Sweden. In %



Supply

● Oil	28.5
● Coal	4.7
● Gas	1.7
● Nuclear	34.0
● CRW*	18.4
● Hydro	10.3
● Wind	0.2
○ Others	2.2

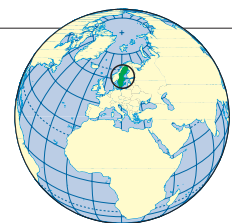


Consumption

● Oil	37.2
● Coal	2.3
● Gas	1.9
● Electricity	32.3
● CRW*	14.4
● Heat	11.9

By sector

Industry	42
Transport	24
Others	33



*CRW: Combustible Renewables and Waste
X&Y Graphics



Nuclear power plant at dusk, Barseback, Skane, Sweden. Photo: Altrendo Images

and SCA, and Vattenfall and Statkraft) is envisaged. SCA and the Norwegian Statkraft group are planning seven wind farms in northern Sweden for €1.7 billion. Svevind, with the backing of German investors, is looking for a site in the north near Piteå to build 1,000 turbines.

Despite the euphoria surrounding wind energy, criticism at the alleged lack of an energy policy remains extensive. Hydropower is a case in point. The lack of expansion of hydropower is said to be due to the government's passiveness. No one is asking that the four protected rivers in Sweden be developed, but rivers that are already being used for hydropower could be used more extensively.

The government does not allow any large-scale expansion of the natural gas supply, either. There is only one modest network supplied with Danish natural gas on the west coast, which contributes 1 TWh to energy production. In January, Swedegas, a federation of Swedish companies, submitted an application for the construction of an 810 km long offshore gas pipeline from Norway, to supply industrial plants in southern Norway, Jutland (Denmark) and western Sweden. This gas is intended to replace gas from Denmark, as Danish supplies look set to decrease. Other attempts to bring natural gas into Sweden are failing due to political resistance and objections from the forestry industry and agriculture – sectors that fear their own ecological energy resources will be crowded out of power production. The conservative MP Ola Sundell said that the gas pipeline application is 'not something

to cheer about'. Stefan Edman, General Secretary of the Oil Commission, a body that intends to make Sweden 'oil-free' – an idea that got a lot of publicity outside Sweden some years ago, but that no one in Sweden believes in – says that more natural gas could hamper the development of ecological energy resources.

Obscene profits |

Both industry and consumers have been highly critical of the deregulation of the electricity market and the creation of the Nordic power exchange, Nord Pool. Sverker Martin-Löf, Chairman of the Supervisory Board of steel producer SSAB, the forestry company and hygiene product manufacturer SCA and the construction group Skanska, has described deregulation as a 'complete failure'. He has said that the sharp increase in electricity prices 'has seriously compromised the ability of Sweden's primary industry to compete, damaging its prospects for the future'.

As one of the most important industry figures in the country, his opinion carries weight. He argues that 'it was thanks to cheap electricity that Sweden was able to build up such a successful primary industry. But now the competitive advantage historically enjoyed by Swedish companies has been negated.'

SCA has postponed investments of SEK 5 billion for the time being. Primary industry, mainly the forestry, pulp and paper industry as well as mining, steel and chemicals, has formed its own supply organisation called Basel. Its first attempt to obtain cheaper energy from Russia

failed due to resistance from Finland, which refused to approve additional transfer capacity. Basel is now trying to make headway in Norway. But business has itself to blame too. Immediately after deregulation, it sold the power it produced itself at good prices. 'Today, this must be seen as a serious mistake,' Martin-Löf admits. 'At the time, we believed the market would function.'

It is above all the alleged lack of competition that infuriates many observers. The electricity market is dominated by three companies. Swedish state utility Vattenfall supplies over 45%, Eon 21.4% and the Finnish state company Fortum 19.3%. 'There is no electricity market deserving of the name', observes the Svenska Dagbladet. 'With their low production costs, producers in Sweden, Finland and Norway are making obscene profits at the expense of the customer.' The financial newspaper Dagens Industri has complained that the bill footed by industry and households in Sweden for the recently agreed extension to renewable energy subsidies might well be over SEK 50 billion (€5.3 billion). 'The winners are the stock market giants, the electricity providers and other stakeholders who can anticipate billions in investment subsidies.'

Clearly, the government still has some tasks ahead of it when it comes to energy policy. In the eyes of the Social Democrats, now in opposition, 'the government talks a lot but does little.' In the autumn, the government will present a comprehensive climate policy bill. The media are already calling this a baptism of fire. ■