17 February 2022

Nordic Research

A helicopter look at energy dependence

- **Energy inputs in to production varies significantly across the Nordics. The Danish manufacturing sector runs on far less energy compared to the OECD average. The Norwegian runs on a lot more.**
- **The direct energy consumption share is relatively low in the Nordics. Taking indirect energy input in to account, the energy intensity of consumption reflects the Nordics' production patterns.**
- **A model experiment confirms findings and shows DK/SWE/FIN production is less sensitive to an oil price shock. The same goes for private consumption, which is only affected by half as much as the euro area.**

The importance of efficient energy usage has been pushed further forward by high energy prices

Energy prices have soared over the last eight months along with carbon emission prices. That leaves many businesses with large bills of which they might decide to pass all or some on in the value chain and to their customers. Having as energy efficient a production as possible is both a short term and long-term priority for businesses. We have taken a helicopter look at the energy intensity of the Nordic economies. We have used OECD's TiVA (Trade in Value Added) database, which maps global supply chains in a way not possible with conventional trade data.

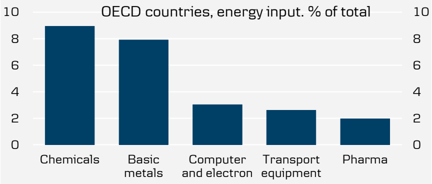
The energy input in the Nordic manufacturing sectors varies significantly across countries

Among OECD countries, the energy input is particularly high in the production of chemicals and basic metals. Low energy intensive production includes pharmaceuticals, transport equipment and computers and electronics. The composition of production is key to a country's overall energy dependence.

Norway has a much higher energy input in its manufacturing exports compared to other countries, reflecting a large production of basic metals and refined petroleum products; both energy intensive production. Cheap hydropower gives Norway an edge here, and the electricity/gas input in production is also significantly higher than the OECD average. Zooming in on basic metals production, particularly the electricity/gas input is high. It constitutes 10.3% of total input in Norway compared to the 3.3% OECD average.

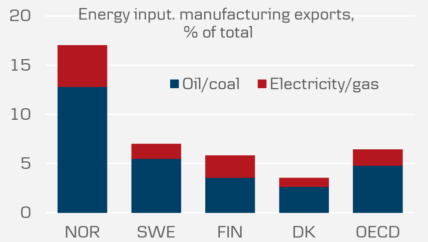
Sweden is slightly above the 6.4% OECD average, largely due to its production of refined petroleum products. Its large transport equipment production on the other hand pulls down in the overall energy intensity of manufacturing with Swedish transport equipment production being more energy efficient than the OECD average.

Most and least energy intensive manufacturing



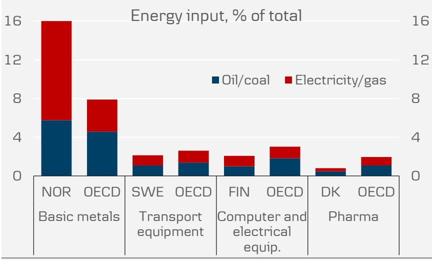
Sources: OECD TiVA data, Danske Bank

Norwegian production by far the most energy intensive among Nordics



Source: OECD TiVA data , Danske Bank

Energy efficiency in key production sectors.



Source: OECD TiVA data , Danske Bank

Senior Analyst
Bjørn Tangaa Sillemann
+45 45 12 82 29
bjsi@danskebank.dk

Finland overall has a lower than average energy input in its manufacturing production, which is largely due to a large machinery and computer and electrical equipment production running on very little energy input.

Denmark has a significantly smaller energy input in manufacturing exports compared to the OECD average. Actually, it is the lowest among peers. A key reason is a large production of low energy input pharmaceuticals; a production that is even more energy efficient compared to peers. Energy efficiency in machinery and food production is also quite low.

Producer prices reflect the energy dependence in production. The increase in prices traded for Norwegian, Swedish and German manufactured goods have risen a lot more than Danish prices. Finnish prices have also increased sharply, largely due to a surge in prices on basic metals.

Energy inputs in to consumption reflect production patterns

If instead we look at it from the consumers' perspective, HICP weights show that all the Nordics use a smaller proportion of total consumption on energy compared to the euro area. This is true both when including and excluding heat energy, which has varying input from fossil fuels. In that sense, the Nordics come out less energy intensive when looking from the demand side compared to the supply side.

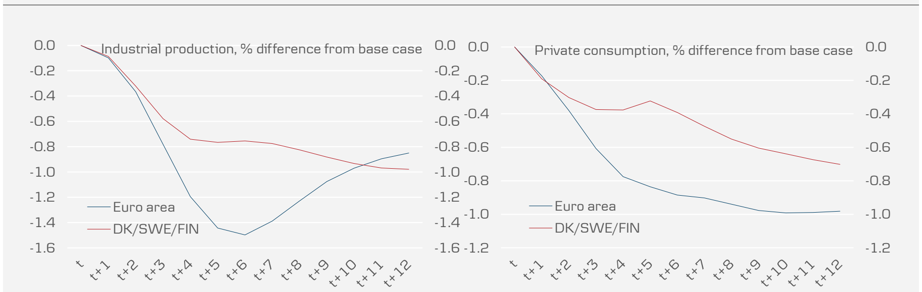
The picture is different when using the input-output approach and thus accounting for the indirect energy input as well. Then the data indicates that indirect energy inputs are quite large in the Nordics. Finnish and Swedish energy inputs in to consumption are slightly below the euro area average but above the OECD average. In Norway, the energy input is larger compared to both the euro area and OECD, even though the direct consumption of energy is not, reflecting the high energy dependency of production. Danish consumption remains less energy intensive than the rest of the pack, something that can also help explaining the economy's strong performance in 2022 despite surging energy prices.

Model experiment confirms findings

Running an experiment with a 50USD increase in oil prices in Oxfords Economics' global economic model reflects the lower oil dependence in the manufacturing sector and consumption in the Nordics as a whole (excluding Norway).

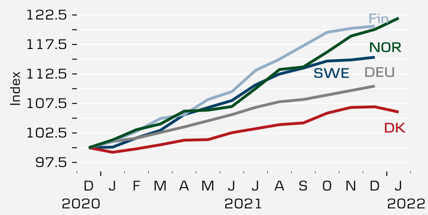
Industrial production declines by only about half as much in the first year in DK/SWE/FIN compared to the euro area. The effect converges with time, though. Real consumption in DK/SWE/FIN is also much less affected compared to the euro area. After one year, private consumption is down 0.4% in the Nordics, only half of the decline in the euro area.

Reaction to USD50 oil price increase



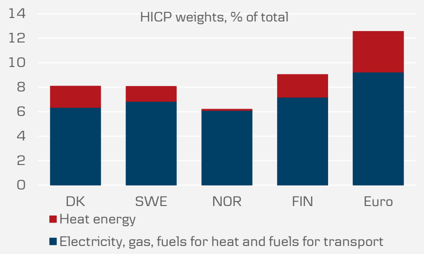
Source: Oxford Economics global economic model, Danske Bank

Producer prices for manufactured goods



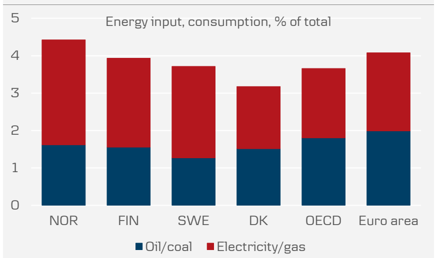
Source: Macrobond Financial, Danske Bank

Direct energy consumption share relatively low among Nordics



Source: Eurostat, Danske Bank

Nordic consumption more energy intensive when accounting for indirect consumption



Source: OECD TiVA data , Danske Bank

Disclosure

This research report has been prepared by Danske Bank A/S ('Danske Bank'). The author of this research report is Bjørn Tangaa Sillemann, Senior Analyst.

Analyst certification

Each research analyst responsible for the content of this research report certifies that the views expressed in the research report accurately reflect the research analyst's personal view about the financial instruments and issuers covered by the research report. Each responsible research analyst further certifies that no part of the compensation of the research analyst was, is or will be, directly or indirectly, related to the specific recommendations expressed in the research report.

Regulation

Authorised and regulated by the Danish Financial Services Authority (Finanstilsynet). Deemed authorised by the Prudential Regulation Authority. Subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details of the Temporary Permissions Regime, which allows EEA-based firms to operate in the UK for a limited period while seeking full authorisation, are available on the Financial Conduct Authority's website.

Danske Bank's research reports are prepared in accordance with the recommendations of the Danish Securities Dealers Association.

Conflicts of interest

Danske Bank has established procedures to prevent conflicts of interest and to ensure the provision of high-quality research based on research objectivity and independence. These procedures are documented in Danske Bank's research policies. Employees within Danske Bank's Research Departments have been instructed that any request that might impair the objectivity and independence of research shall be referred to Research Management and the Compliance Department. Danske Bank's Research Departments are organised independently from, and do not report to, other business areas within Danske Bank.

Research analysts are remunerated in part based on the overall profitability of Danske Bank, which includes investment banking revenues, but do not receive bonuses or other remuneration linked to specific corporate finance or debt capital transactions.

Financial models and/or methodology used in this research report

Calculations and presentations in this research report are based on standard econometric tools and methodology as well as publicly available statistics for each individual security, issuer and/or country. Documentation can be obtained from the authors on request.

Risk warning

Major risks connected with recommendations or opinions in this research report, including as sensitivity analysis of relevant assumptions, are stated throughout the text.

Expected updates

Ad hoc

Date of first publication

See the front page of this research report for the date of first publication.

Disclaimer

This research has been prepared by Danske Bank A/S. It is provided for informational purposes only and should not be considered investment, legal or tax advice. It does not constitute or form part of, and shall under no circumstances be considered as, an offer to sell or a solicitation of an offer to purchase or sell any relevant financial instruments (i.e. financial instruments mentioned herein or other financial instruments of any issuer mentioned herein and/or options, warrants, rights or other interests with respect to any such financial instruments) ('Relevant Financial Instruments').

This research report has been prepared independently and solely on the basis of publicly available information that Danske Bank A/S considers to be reliable but Danske Bank A/S has not independently verified the contents hereof. While reasonable care has been taken to ensure that its contents are not untrue or misleading, no representation or warranty, express or implied, is made as to, and no reliance should be placed on, the fairness, accuracy, completeness or reasonableness of the information, opinions and projections contained in this research report and Danske Bank A/S, its affiliates and subsidiaries accept no liability whatsoever for any direct or consequential loss, including without limitation any loss of profits, arising from reliance on this research report.

The opinions expressed herein are the opinions of the research analysts and reflect their opinion as of the date hereof. These opinions are subject to change and Danske Bank A/S does not undertake to notify any recipient of this research report of any such change nor of any other changes related to the information provided in this research report.

This research report is not intended for, and may not be redistributed to, retail customers in the United Kingdom (see separate disclaimer below) and retail customers in the European Economic Area as defined by Directive 2014/65/EU.

Disclaimer related to distribution in the United States

This research report was created by Danske Bank A/S and is distributed in the United States by Danske Markets Inc., a U.S. registered broker-dealer and subsidiary of Danske Bank A/S, pursuant to SEC Rule 15a-6 and related interpretations issued by the U.S. Securities and Exchange Commission. The research report is intended for distribution in the United States solely to 'U.S. institutional investors' as defined in SEC Rule 15a-6. Danske Markets Inc. accepts responsibility for this research report in connection with distribution in the United States solely to 'U.S. institutional investors'.

Danske Bank A/S is not subject to U.S. rules with regard to the preparation of research reports and the independence of research analysts. In addition, the research analysts of Danske Bank A/S who have prepared this research report are not registered or qualified as research analysts with the New York Stock Exchange or Financial Industry Regulatory Authority but satisfy the applicable requirements of a non-U.S. jurisdiction.

Any U.S. investor recipient of this research report who wishes to purchase or sell any Relevant Financial Instrument may do so only by contacting Danske Markets Inc. directly and should be aware that investing in non-U.S. financial instruments may entail certain risks. Financial instruments of non-U.S. issuers may not be registered with the U.S. Securities and Exchange Commission and may not be subject to the reporting and auditing standards of the U.S. Securities and Exchange Commission.

Disclaimer related to distribution in the United Kingdom

In the United Kingdom, this document is for distribution only to (I) persons who have professional experience in matters relating to investments falling within article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (the 'Order'); (II) high net worth entities falling within article 49(2)(a) to (d) of the Order; or (III) persons who are an elective professional client or a per se professional client under Chapter 3 of the FCA Conduct of Business Sourcebook (all such persons together being referred to as 'Relevant Persons'). In the United Kingdom, this document is directed only at Relevant Persons, and other persons should not act or rely on this document or any of its contents.

Disclaimer related to distribution in the European Economic Area

This document is being distributed to and is directed only at persons in member states of the European Economic Area ('EEA') who are 'Qualified Investors' within the meaning of Article 2(e) of the Prospectus Regulation (Regulation (EU) 2017/1129) ('Qualified Investors'). Any person in the EEA who receives this document will be deemed to have represented and agreed that it is a Qualified Investor. Any such recipient will also be deemed to have represented and agreed that it has not received this document on behalf of persons in the EEA other than Qualified Investors or persons in the UK and member states (where equivalent legislation exists) for whom the investor has authority to make decisions on a wholly discretionary basis. Danske Bank A/S will rely on the truth and accuracy of the foregoing representations and agreements. Any person in the EEA who is not a Qualified Investor should not act or rely on this document or any of its contents.

Report completed: 16 February 2022, 14:00 CET

Report first disseminated: 17 February 2022, 06:00 CET

Disclosure

[Insert Disclosure]

Disclaimer

[Insert Disclaimer]