

Value added in the Norwegian Bioeconomy



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by Eirik Mikkelsen

Cover illustration: Screenshot from Google Maps/Earth showing Norway, including ocean areas around it.

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<p>Abstract</p> <p>The Biosmart project (www.biosmart.no) will establish knowledge and support for the development of a profitable and sustainable Norwegian bioeconomy, and especially for integration across the traditional sector barriers</p> <p>This report contributes to the project by presenting the status and recent trends in value added in the Norwegian bioeconomy. It introduces a classification system for the different segments of the bioeconomy based on official statistics and the industry classification system used by Statistics Norway, which also is compatible with the NACE system of Eurostat.</p> <p>Value added for different bioeconomy industries for 2014 as well as development since 1970 is presented for the national level. It further includes how wage costs, operating surplus and subsidies varied across the bioeconomy sectors in 2014 and within them the latter years. The absolute and relative importance of the bioeconomy sectors in the Norwegian counties is also included.</p> <p>The biggest bioeconomy sectors in Norway in terms of value added are Food products, beverages and tobacco, Agriculture, Aquaculture, Fisheries and Wood and wood products except furniture (from 2014 numbers). Wage costs, operating surplus and subsidies make up very different shares of value added in the industries.</p> <p>All the industries have experienced considerable fluctuations in value added over the last four decades. However, the trends are in particular that Aquaculture and Fisheries have grown a lot. Forestry has also grown, as has Agriculture. Textiles, wearing apparel and leather goods is the sector that has a marked reduction in value added over time.</p> <p>The value added in the nine bioeconomy sectors reported here made up 3.7 % of Norway's total value added in 2014. This is a lower bound for the value added of the Norwegian bioeconomy. Many sectors of the national accounts of Statistics Norway include both bioeconomy and non-bioeconomy industries and are therefore not included here. The bioeconomy sectors' value added differs a lot between the counties of Norway, both in sum and in what sectors that are dominating.</p>		
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Foreword

This report is part of the Biosmart project; Managing the transition to a smart bioeconomy (www.biosmart.no). The project is lead by the Centre for Rural Research and financed by the Norwegian Research Council's program for Sustainable Innovation in Food and Bio-based Industries (Bionær).

The project's work package on Value added and the work with this particular report has been led by me. I left Norut 1 April for a new main position at Nofima. Heidi Nilsen at Norut now leads the work package.

The work with the report has benefitted from comments from several members of the Biosmart project group, in particular Sindre Myhr at Norut. Jørgen Bro, Norut, has contributed with collection of some data from Statistics Norway. Magnar Forbord, Centre of Rural Research, and Birger Vennesland, NIBIO, have contributed with quality assurance of parts of the report. Any remaining errors are my responsibility.

I hope people find the report interesting, and that it will be useful in the continuing work in the Biosmart project.

Eirik Mikkelsen

Tromsø, 26 May 2017

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Introduction

The term bioeconomy has come strongly to politics and industrial development the latter years. The OECD got outlined a bioeconomy policy agenda in 2009 (OECD 2009) and the EU made its first Bioeconomy strategy in 2012 (EU 2012). Norway launched its first bioeconomy strategy in 2016 (Anon 2016). Before that, the Norwegian Research Council had decided to support the Biosmart research and foresight project; “Managing the transition to a smart bioeconomy”.

There are different visions or understandings of what “the Bioeconomy” is or should be (Bugge et al 2016). According to the European commission “The bioeconomy comprises those parts of the economy that use renewable biological resources from land and sea – such as crops, forests, fish, animals and micro-organisms – to produce food, materials and energy”¹. The OECD (2009) focuses on “The application of biotechnology to primary production, health and industry [...] The bioeconomy in 2030 is likely to involve three elements: advanced knowledge of genes and complex cell processes, renewable biomass, and the integration of biotechnology applications across sectors.”

Regardless of which definition one emphasises, the future production and value added of the bioeconomy will depend on biological resources (Falk-Andersson et al 2016), but clearly also human resources, including in research and development, infrastructure and processing facilities, and policies and supporting measures (de Besi and McCormick 2015; Bruvoll et al. 2015, OECD 2016, Scarlat et al. 2015, Rønnesland et al. 2014).

The Biosmart project will establish knowledge and support for the development of a profitable and sustainable Norwegian bioeconomy, and especially for integration across the traditional sector barriers. As part of the Biosmart project, the aim of this report is to provide an overview of the value added in the bioeconomy in Norway, showing current status and recent trends, split on sectors and regions. In doing so, the report is open to all of the definitions above as, well as including all related activities along the value chains.

After this introduction we define what value added is, present a way to classify the different segments of the bio-economy based on official statistics, and point to some methodological challenges given current data availability. In the main part we present value added of different industries of the bioeconomy in 2014 as well as trends for this since 1970, at the national level. We also show how wage costs, operating surplus and subsidies varied across the bioeconomy sectors in 2014 and within them the latter years. We then show the absolute and relative importance of the bioeconomy sectors in the Norwegian counties.

¹ See <https://ec.europa.eu/research/bioeconomy/index.cfm>, last visited 22 May 2017

What is value added?

Estimating value added is an attempt to measure the economic benefits that an economic activity have for all of society. Economic activities are operations that provide goods or services. Considering a private company, the value added is the difference between its total revenues and the total costs of the inputs that have gone into making its products and/or services.

However, the cost of labour (wages) and for financing (capital cost) is not counted as input costs. This is because workers who provide labour and capital owners who provide financial capital contribute to the value added and get wages and interest on capital as their share of the value added. In addition to this, the company owners get profits as their share of the value added, and also the public get a share of value added through net taxes. See illustration in Figure 1. Net taxes imply that there could be both taxes/tariffs paid by the company and subsidies received.

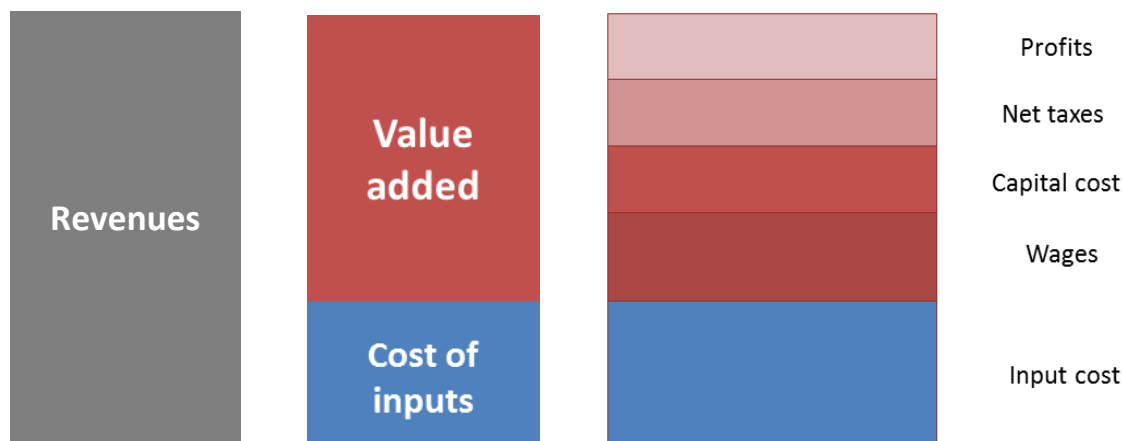


Figure 1 – Value added illustrated

How big share of revenues which costs of inputs, wages, profits etc. make up vary a lot between industries, companies and over time, so the shares indicated in Figure 1 is just an illustration.

Note that an industrial activity can add net value to society even if it is not profitable for the company owners. Of course, if the profits are not positive in the long term, the activity is not economically sustainable.

The term “value creation” is sometimes used synonymously with value added as it is described above. Value creation is also used to indicate the increase in valuation of a company for example on the stock exchange.² In this report, we will only use the term value added.

There can be some challenges with calculating value added. Not all economic activities take place in private companies. Many take place in public organisations and in households or

² See for example <http://www.economist.com/node/14301714>, visited 26 May 2017.

other civil organisations. Naturally then, different economic activities are financed in different ways. Some through the market (i.e. paid a market price for), some by the authorities (provided as public services or subsidised by authorities), and some are financed by voluntary efforts and contributions from households and individuals. Combinations of these are also possible. This gives challenges for calculating value added for two main reasons. The first is that it may not be clear what should be counted as the value of the products and services provided. When, unlike for something that is traded in the market, there is no price tag attached, the value of products and services must be estimated for value added calculations.

Related to this is that there may be difficulties of setting a price tag on some services because they can be what economists call *public goods*. A “good” is a general term for a product or a service. The antonym of a public good is a *private good*, for which when one person uses the good no-one else can use it. For public goods many persons can use the good without reducing the benefit others get from it. For a “perfect” public good it does not matter at all how many users there are of the good for the benefit that each enjoy from it. An example can be public radio or TV broadcasts. For less than perfect public goods additional users will reduce the benefits other users get from it. An example can be a public road where users experience various degrees of congestion.

The second main challenge is that it can be difficult to estimate the cost of provision of products or services by public authorities, households or civil organisations. Public authorities and agencies will have budgets that can be used for cost estimation, but they provide in many cases a mix of products and services as well as perform various control and monitoring tasks, all financed over the same budget. For goods and services provided by civil society there may not be any cost budget or accounting at all. Some might have an overview over how many hours or days people have contributed with, but that leaves the challenge of putting a price per hour or day of labour.

Some economic activities can give effects for others than the ones using the product or service they make. Economists say that some activities can give positive or negative *external effects*. An external effect is an impact that an activity has on others, but the actor behind the activity has no reason to consider it. It can e.g. be a farmer or fish farmer contributing to a landscape that is considered attractive, or ugly, for residents or tourists, or an activity that gives pollution that is not regulated. The benefits or costs that people experience due to such external effects should also be evaluated and included in a grand calculation of the net benefits that economic activities provide.

A full-fledged cost-benefit analysis of an activity will include the “narrow” value added that market operations provide, and the valuation of costs and benefits of public and private economic activities, as well as of external effects.

Other measures of the importance or extent of economic activities that sometimes are used include total revenues, export value, the number of employees, or producer and consumer surplus. All of these can be interesting and serve some purposes. The three first might be easier to get data on from public records than what is needed for value added estimates.

Producer and consumer surplus is however typically much more demanding to get necessary data on. Value added is the more general measure that we will focus on here.

In the report we will only consider the value added from market operations of private bioeconomy companies. This is due to the availability of data, and the scope and resources available for the work.

The overall estimation of value added from a company's activities requires data on overall revenues and costs of inputs. Both are normally available from figures that companies must report for calculations of value added tax, at least in Norway. For public limited companies that must issue annual (financial) reports these figures can be found there, but for other companies these figures are not publicly available for individual companies. However, Statistics Norway (SSB) issues summary statistics on this by region and *industry codes*.

The data that SSB provides is "gross product". When this is aggregated up for all sectors of the economy of the whole of a country one gets a figure for GNP or GDP - the Gross National (or Domestic) Product. The "gross" here refers to that the depreciation of physical capital is not included as a cost of inputs for the companies. If this was included, one would end up with Net National Product.

Economic activity in a single company gives ripple effects to other parts of the economy (Jacobsen et al 2014). Most companies are only in a part of a value chain. They purchase goods and services from other companies, and their products are input to other companies. When other companies get increased demand for their products they also must buy more from their suppliers, and so on. This gives what is termed indirect economic effects in economic ripple effects studies. The income that workers, owners and public authorities receive creates demand for goods and services, but this can be in totally unrelated sectors. This is termed induced effects. All these linkages mean that the economic impact of a single company's activities is "multiplied up".

Economists can calculate multipliers of the economic impact from activities at different level; at project level, company level, sector in a region, and so on. The method relies on input-output matrices of how sectors buy and sell to each other, and can be at different regional levels, as well as between sectors in different regions (see e.g. Dyck and Sumaila 2010). Input-output matrices are quite data-intensive and demanding to create, so if they at all exist they may not be updated very often, at least not on detailed sector or geography level (op cit.). They are usually created based on survey data, so figures may not be very accurate on detailed sector or regional level. In addition, if the industrial structure of a region or the purchasing pattern of companies and industries has changed much since the input-output matrix was created or updated, analyses can give quite large errors (op cit.)

In Norway, an important regional input-output model is the Panda-system³, but Statistics Norway and SINTEF and others also have their own input-output models for different regional levels and purposes. At national level and for coarse economic sectors Statistics Norway publish input-output matrices annually. The Panda model operates with ca 50

³ See <http://www.pandagruppen.no>.

different industries and regions down to municipal level, but the coefficients of the Panda system are not updated annually.

In this report we are not considering economic ripple effects of the value added of the bioeconomy sectors, but one should be aware that the economic impact of an industry can be significantly larger than the value added in that sector alone.

Industry codes for statistical classification of the bioeconomy

To present and aggregate data on value added in the bioeconomy it is necessary to define the bioeconomy sectors in relation to existing statistical classifications. We have made a hierarchical classification system for industries in Norway, both for the core bioeconomy industries and “mixed” industries. “Mixed” meaning those industries that can be both within and outside of the bioeconomy. We have also included related industries in the classification, in particular important supply industries to the bioeconomy, or where bioeconomy sectors’ products make up important components of other industries.

When companies register in Norway, and also in the EU, they have to declare an industry sector or segment that covers their main operation, based on a nomenclature of industries. The Norwegian Standard for industry classification of 2007 (*Standard for næringsgruppering 2007 – SN2007*) is based on EU’s industry classification NACE revision 2 (Nomenclature... Commerciale de l’Europe).

As this is a standard that covers both Norway and the EU, and it covers all industries, we have used this as the starting point for defining different segments or sectors of the bioeconomy.

Further, the industry code that companies register is overseen by Statistics Norway, and can also be checked and verified by other state agencies. Larger companies may be subdivided statistically into several smaller entities on different industry codes provided they are in separate geographic locations and each of some size (minimum 5 or 10 employees, minimum 10 if they are in a manufacturing sector). It is also possible to have a subsidiary industry sector code on a company, but in the statistical summing up for industries that SSB do, it is normally only done based on the primary industry code.

The SN2007 is a hierarchical system of industry codes. The standard has five levels with a total of 1809 individual codes. The table below gives an overview.

Table 1 - Overview of SN2007 (Standard for industry classification)

Example code	Short name	Level/Designation	Number of codes
A		1 Section	21
08		2 Division	87
08.1		3 Group	270
08.12		4 Class	613
08.123		5 Subclass	818

The table below gives an overview of the bioeconomy sectors we have defined based on SN2007. We define some industries as “pure Bioeconomy-industries”, and some that are mixed industries, containing also non-bioeconomy activities. Pure bioeconomy industries are Ref# 1 to 7 in Table 2 below, while mixed bioeconomy industries are Ref# 8 to 16.

Table 2 - Overview of bioeconomy sectors

Bioeconomy industry sector groups	Bioeconomy sectors	Ref#
<i>Agriculture and forestry</i>	Agriculture	1
	Forestry	2
<i>Fisheries and aquaculture</i>	Fisheries	3
	Aquaculture	4
<i>Processing agriculture, forestry and marine products</i>	Processing agriculture products	5
	Processing Marine products	6
	Processing forestry products	7
Other processing industries of bioeconomy	Other processing industries	8
	Biotech	9
Production and maintenance of equipment for bioeconomy industries	Production and maintenance of equipment for bioeconomy industries	10
Energy production and distribution of bioeconomy	Energy production and distribution	11
Recycling of bioeconomy products	Recycling	12
Trade of bioeconomy products and services	Trade Agriculture	13
	Trade seafood and marine industries	14
	Trade and services from Forestry products	15
Other trade and services of bioeconomy	Other trade and services of bioeconomy	16

The *core bioeconomy sectors* are Agriculture, Forestry, Fisheries and Aquaculture (Ref# 1+2+3+4 in- Overview of bioeconomy sectors), growing or harvesting the basic biological raw material for the bioeconomy.

The processing of these raw materials is classified into two different bioeconomy industry groups, one (mainly) processing bioeconomy raw materials to foodstuffs and basic materials ready for further processing (5+6+7), and one (mainly) with continued processing based on the already processed bioeconomy raw materials, including chemical and biotechnological processes (8+9). Some of the latter may also be processing based on materials from non-bioeconomy sources, like petroleum-chemical industries.

Production and maintenance of equipment for the bioeconomy industries are in (10), and includes products and maintenance both for the basic bioeconomy sectors (1+2+3+4) and the processing industries (5+6+7+8+9).

Energy production and distribution based on bioeconomy resources are in (11). Some of the sub-industries may include activities also from non-bioeconomy sectors.

Recycling (12) is about re-capturing the raw and processed bioeconomy materials that can be used again for material production. Using waste for energy-production is included in Energy (11).

Trade (13-16) includes wholesale and retail trade of a number of goods and services: bioeconomy raw materials to foodstuffs; basic materials ready for further processing; equipment for the basic bioeconomy industries; further and other processed bioeconomy goods; equipment for this processing; and bioeconomy-related services, like restaurants and cafes and similar that base their services on food and drinks to a large degree .

A table with all the NACE codes we have defined as part of the bioeconomy, core and mixed, is in appendix 1. It is also possible to get excel-sheets with the classification by contacting the authors.

Rönnlund et al. (2014;) have also made a possible classification of the bioeconomy. Their report considers all of the Nordic countries. In addition to the “traditional” bioeconomy sectors and technologies directly relevant them, they include “Emerging technologies” where biomass-based products may replace the current fossil-based products, and also technologies that may be relevant for the emerging bioeconomy.

Method and data sources

The main source for the data compiled here has been Statistics Norway (www.ssb.no). The webpages below have the latest available data, and also present details on definitions, production of data (collection and aggregation), accuracy and reliability, and more.

Annual national accounts: <https://www.ssb.no/en/nr>

Quarterly national accounts: <https://www.ssb.no/en/knr>

Note: From 16 May 2017 both annual and quarterly national accounts will be published here.

Regional accounts: <https://www.ssb.no/en/fnr>

StatBank Norway contains detailed tables with more variables and longer time series than is available from the ordinary publication of statistics once or several times a year. Data series from *StatBank Norway* is the main source for annual and quarterly national accounts and regional accounts for this report: <https://www.ssb.no/en/statistikbanken>

In the readily available statistics in *StatBank Norway* the industry classification presented is coarse. County-wise regional accounts (fylkesfordelt nasjonalregnskap) have up to 39 sectors (sector classification system A38), while national accounts have up to 66 sectors (A64).

As many of the bioeconomy-relevant industries are sub-sectors of sectors that include and can be dominated by non-bioeconomy industries, we cannot present detailed statistics

without ordering detailed data from Statistics Norway. Confidentiality issues will however limit the availability of statistics at detailed industry or region level.

We have hence focused on sectors that are core bioeconomy or clearly bioeconomy-dominated. The sectors that have a large proportion of subsectors outside of the bioeconomy are therefore not presented here.

Value added is measured and reported in *basic value*⁴ (“basisverdi”). Basic value is what the producer is left with after selling his product, having paid any product taxes including value added tax (VAT), and received any subsidies. The costs of the material inputs (“produktinnsats”) is measured as what the producer paid for it, and the value added (“bruttoprodukt”) is the difference between the basic value and the material inputs.

In public administration and other non-marketed activities the value added is defined as the sum of wage costs, net production taxes and depreciation of physical capital.

The regional accounts are not made “bottom-up”, but with main figures from the national accounts that have been divided between counties. The division is done using a number of allocation keys made with data from industry structure statistics, revenue statistics, wage and tax deduction statistics, reporting from municipalities and regional state bodies, petroleum statistics and the Fisheries directorate, as well as other sources.

Statistics Norway state that there are uncertainties related both to the national accounts and the regional accounts. From time to time there will also be changes in data definitions or data sources which imply that data before and after the change are not directly comparable.

There was a revision of the industry classification system effective from 2008, so not all statistics for years before and after this is comparable in the national accounts. There was also a major revision of national accounts in 2014, affecting statistics presented for 2011 onwards, implying that not all regional accounts for years before and after 2011 are directly comparable. For the aggregate level that most statistics are presented on in this report, the importance of this should be limited. For the regional accounts for sectors, we only present time series data back to 2008.

Value-creation in major Norwegian bioeconomy sectors

The bioeconomy sector in Norway with the largest value added is the Food and drink industry⁵ (Figure 2). With 37 Billion NOK in 2014 it had nearly three times as high value added as the second largest, Agriculture, at 13 Billion NOK. The third largest in 2014 was Aquaculture, which has grown tremendously since the early 1990-ies (Figure 3), and was nearly as large as Agriculture. Fisheries have also had an upward trend in value added since 1970, but not as pronounced as Aquaculture. It had 9 Billion NOK in value added in 2014. Wood and wood related products at 7.5 Billion NOK, and Furniture at 5.7 Billion NOK follows next. They were both larger than Forestry, which had a value added of 4.7 Billion. Water

⁴ All the definitions are from Statistics Norway. See <https://www.ssb.no/en/nasjonalregnskap-og-konjunkturer/concepts-and-definitions-in-national-accounts>

⁵ The formal name in the NACE classification is “Food, drinks and tobacco industry”.

supply, Textiles, clothing and leather goods, and Paper and pulp had between 2 and 4 Billion NOK in value added.

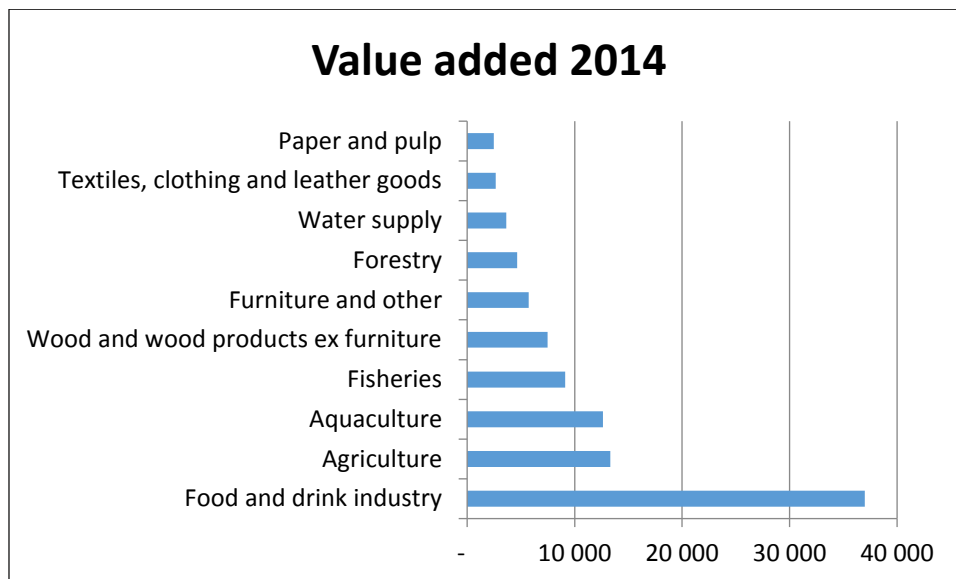


Figure 2: Value added in major bioeconomy sectors in Norway in 2014. Mill NOK. Source: SSB.

All of the bioeconomy sectors reported here have fluctuations in their value added from year to year⁶ (Figure 3 - Figure 5). Among the core biomass-producing sectors, the variability is larger for Agriculture and Fisheries than for Forestry and Aquaculture. This is natural given Agriculture and Fisheries' stronger dependence and vulnerability of yearly weather and commercial fish stocks that are in a complex interdependence with the rest of the marine ecosystem. In Forestry, the standing stock that gets logged in one year have been built up over many years, evening out and reducing the impact of annual variability in climate, compared to many parts of agriculture. In Aquaculture, the production conditions are quite controlled and less dependent on climate than in Agriculture. However, just like in Agriculture, the production and hence value added can be impacted by diseases and parasites.

There have been various disease outbreaks in Norwegian aquaculture, but not as widespread and devastating as the ones Chilean salmon farming experienced in 2008-10. Currently, a salmon lice parasite has limited the growth of Norwegian salmon farming, but not because it affects the survival or growth of the farmed salmon itself. Rather, the

⁶ To make meaningful comparisons of value added between years, values for different years have been given fixed to the prices in a particular year, here 2005, indicated by "in Mill 2005 NOK". This is to eliminate the effect of inflation. Different goods typically don't have the same price increases from year to year. This can lead to the values for sectors being very different when measured in 2005 NOK compared to in running prices. It also means that sectors with the same values in NOK for 2014, measured in running prices, can have different values from each other when measured in 2005 NOK, at fixed prices.

authorities have limited the issuing of new production licenses to protect wild salmon stocks. The wild smolt going from the rivers and into the sea can be affected by high lice numbers in salmon farms in their vicinity. This is just one example of regulations affecting the growth and value added of bioeconomy sectors. All Norwegian marine fisheries are quota managed, and Agriculture is also heavy regulated, particularly through quotas and direct or indirect subsidies.

Also demand and supply conditions in domestic and global or selected export markets can impact value added. Agriculture is mainly producing for a domestic market that is strongly regulated, at least in the parts of the year when Norwegian agriculture harvest and sell most of their production.⁷ Fisheries and Aquaculture, on the other hand, export nearly all of their production. Europe is the most important market.

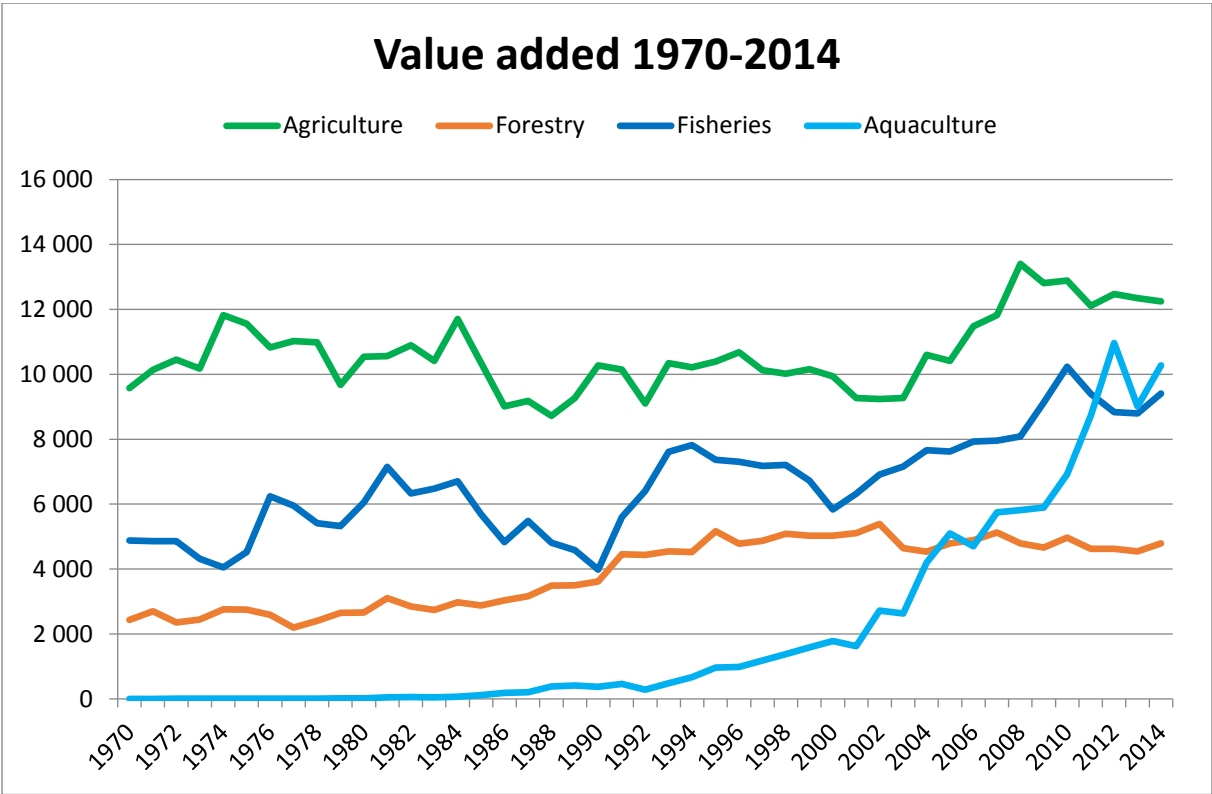


Figure 3: Value added in selected bioeconomy industries in Norway 1970-2015, in mill. 2005 NOK. Source: SSB.

The value added of the Norwegian Paper and pulp production industry grew fairly steady until 2007, but then it collapsed. Since then much of Norwegian pulpwood is exported, mainly to Germany and Sweden. The sector Wood and wood products except furniture have experienced strong ups and downs over the years, and had a similar collapse as in Paper and

⁷ More details about production, economy and markets for agriculture and forestry can be found in Knutsen (2016).

pulp from 2006. Textile, clothes and leather goods had a fairly steady decline in value added between 1970 and 1990, from 5 to 2.3 Billion 2005 NOK. Since then it has fluctuated between 2 and 3 Billion 2005 NOK in annual value added. The Furniture and other have had a fluctuating value added between 4 and 7.5 Billion 2005 NOK in the period. The lowest value was in 2014.

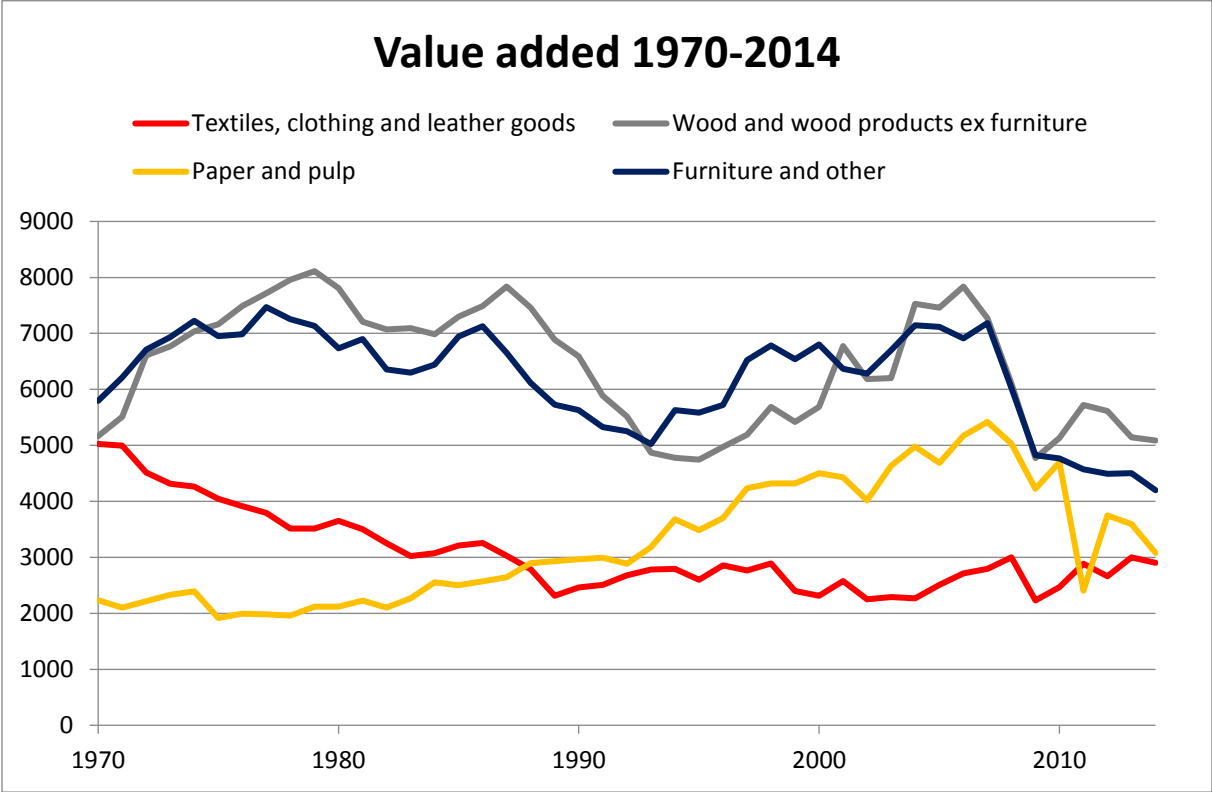


Figure 4: Value added in selected bioeconomy industries in Norway 1970-2015. 2005 mill NOK. Source: SSB.

The Food and drink and tobacco industry in Norway has had an annual value added between 23 and 34 Billion 2005 NOK since the 1970s. Since 1990 it has had an upward trend in value added. The feed industry delivering both to fish farming and agricultural livestock is included in this industry. The Aquaculture industry’s tremendous growth since 1990 is explaining at least some of the growth in the feed industry that is part of Food and drinks.

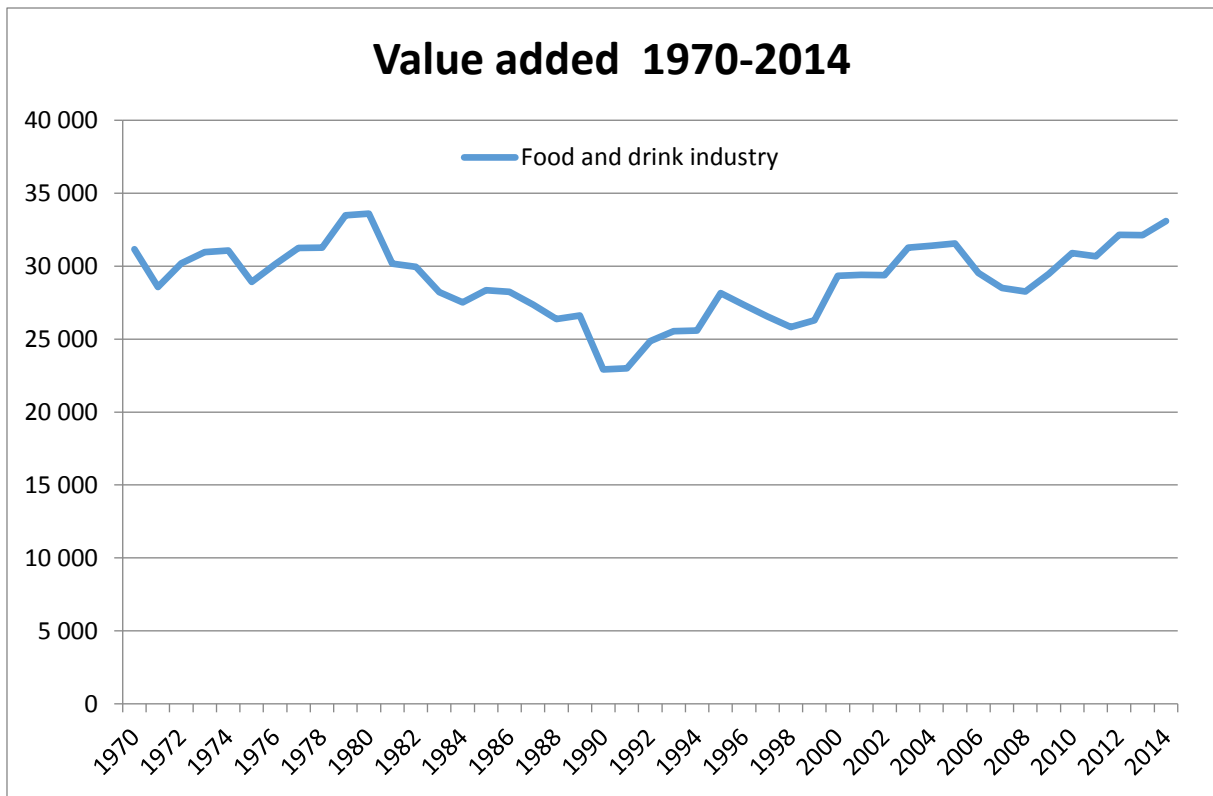


Figure 5: Value added in selected bioeconomy industries in Norway 1970-2015. 2005 mill NOK. Source: SSB.

The sum value added for all the nine bioeconomy industries in Figure 3 to Figure 5 has been between around 60 and 85 Billion 2005 NOK, as is shown in Figure 6. From 1970 to 1980 the trend was that the sum value added grew, from 1980 to 1990 it fell, but since then the trend has been growth.

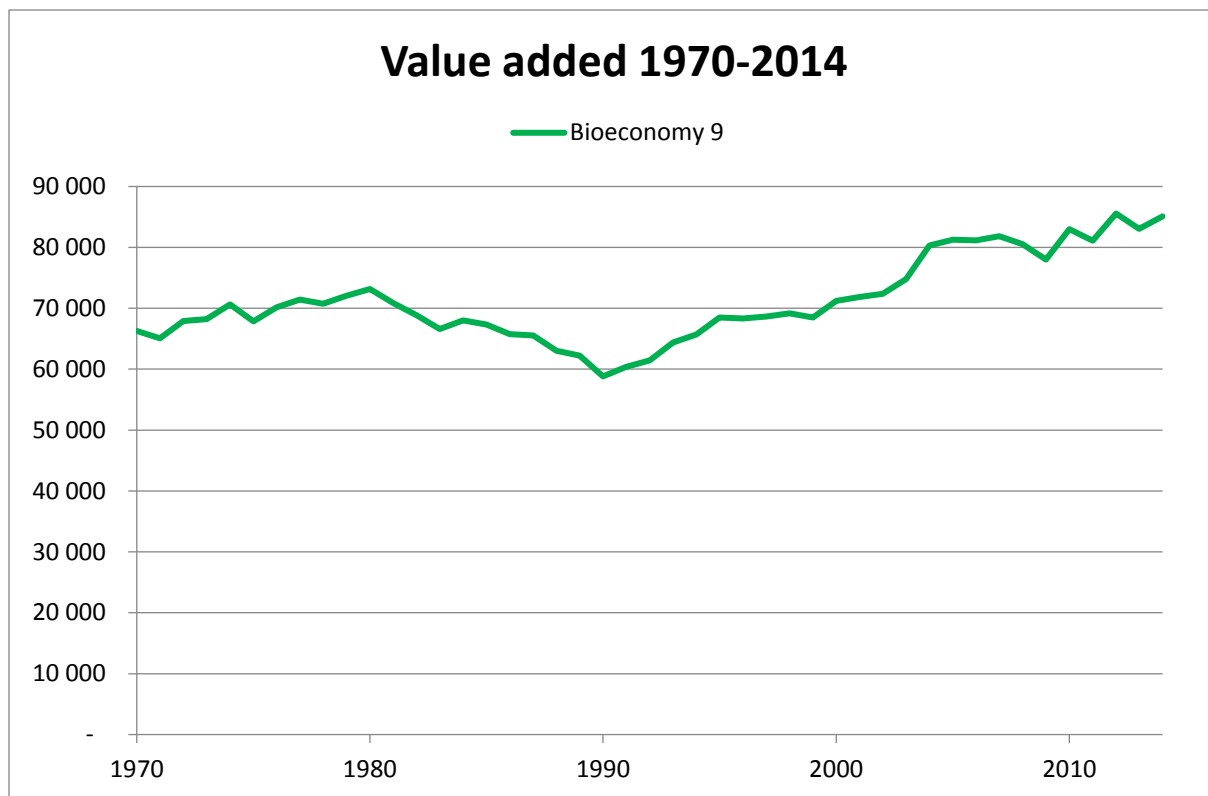


Figure 6: Sum Value added in nine bioeconomy industries in Norway 1970-2015. 2005 mill NOK. Source: SSB.

Other bioeconomy industries

There are a number of sectors where data on value added is not readily available from Statistics Norway. Specialised reports or search for accounting data of companies registered on specific industry codes (NACE codes) in databases can give information about the value creation of these sectors. Companies that operate in a sector could, however, be registered on other industry codes in the databases if another sector makes up a larger share of their market or product. Normally, companies can only register one industry code. In addition, not all types of companies have to have public available accounts, like public limited companies (“aksjeselskap”) must. Specifically, this is the case for companies with sole proprietorship (“enkeltmannsforetak”).

Below are information for some sectors from specialised reports, searches for information from companies registered on specific industry codes⁸, and some other sources.

Reindeer herding

Reindeer herding is a traditional industry and way of life of the Saami, Norway’s indigenous people. Reindeer herding do not have its own industry code in the statistical classification, nor is it mentioned specifically any place in the explanations of the industry codes. Only Saami people can be reindeer herders. Through the Norwegian Constitution’s article 108

⁸ The searches have been made on the web pages of *Proff forvalt*, at www.forvalt.no, 22 May 2017.

“The authorities of the state shall create conditions enabling the Sami people to preserve and develop its language, culture and way of life”. The state supports reindeer herding through an annual agreement. A report on the economics of reindeer herding is released annually.⁹

According to the 2015-report, in 2014 the production value from reindeer herding was 128 mill NOK, the industry received 76 mill NOK in subsidies and 72 mill NOK in compensation for losses due to predators and area interventions. In total, this generated 54 mill NOK in compensation for labour and capital going into the industry.

Production of pharmaceutical raw materials and preparations

This industry (NACE 21) had 88 registered companies with a sum turnover of over 9.4 billion NOK. However, six of the companies alone represented over 9.1 billion NOK of this. The sum annual result was 2.4 billion NOK, and wage costs 1.65 billion NOK, indicating a value added of around 4 billion NOK.

Production of agricultural and forestry machines

This sector had 415 active companies registered (NACE 28.3). The total turnover was 2.0 billion NOK. The sum annual result was 54 mill NOK and the wage costs 664 mill NOK, indicating a value added of around 700 mill NOK.

Production of machines and equipment for food and beverages industry

This sector (NACE 28.93) had 94 registered active companies, with a sum turnover of 1.26 billion NOK. The sum annual result was 23 million NOK, and the sum wage costs 330 million NOK, indicating a total value added around 350 million NOK for this industry.

Production of machines and equipment for textile, wearing apparel and leather goods industry

This sector (NACE 28.94) had only seven active companies. The sum value added was less than one mill NOK.

Production of machinery and equipment for paper and paper goods industry

This sector (NACE 28.95) had only 4 companies registered, with negligible turnover, result and wage costs.

Bioenergy

Production of electricity from biofuel (NACE 35.113) had 65 registered companies with a sum turnover of 75 Mill NOK. The sum yearly result was minus 74 mill NOK and wage costs of 18 mill NOK, indicating negative value added of around 50 mill NOK in 2014.

⁹ See <https://www.landbruksdirektoratet.no/no/reindriften/reindriftsavtalen/totalregnskapet/regnskap-og-budsjett> for the annual accounts/reports

According to data from SSB, the cost of purchased wood or waste for energy consumption in manufacturing industries or mining amounted to 100 mill NOK in 2014. Hence this has limited value added, if any.

The sector Steam and hot water supply (NACE 35.3) had 202 active companies with a total turnover of nearly 3 billion NOK in 2014. They had a sum yearly result of minus 212 mill NOK and wage costs of 360 mill NOK, indicating positive value added despite the negative result.

We don't know the size or value added of the sector supplying firewood to households and companies.

Research and development within biotechnology

This sector (NACE 72.11) had 329 active companies with a total turnover of 809 mill NOK. The sum annual result in 2014 was minus 127 mill NOK, and wage costs 343 mill NOK, indicating a value added of around 215 mill NOK.

Veterinary services

This sector (NACE 75) had 2360 registered companies with a total turnover of 1.45 billion NOK. The sum annual result was 160 mill NOK and wage costs of 625 mill NOK, indicating a total value added of ca 785 mill NOK.

Other sectors

There are also a number of other sectors that are bioeconomy relevant, but where the production also depends on non-bioeconomy sectors to such an extent that it does not make sense for us to present data for their value added here. These sectors can be seen from the tables of bioeconomy-relevant industries of the classification.

Bioeconomy industries compared to other industries

To better understand the value added of the bioeconomy sectors it should be compared to those of other sectors in Norway. Figure 7 shows this for the major value-creating sectors in Norway for 2014. Extraction of oil and gas is not shown, since it would dwarf all other sectors. At 560 billion NOK it had nearly three times as large value added as the second largest sector, Real Estate, at 193 Billion NOK. The value added in Real Estate was in turn five times as large as for the biggest bioeconomy sector, Food and drink. The non-bioeconomy sectors that were closest to Food and drink in terms of value added in 2014 were Accommodation and catering and Legal, accounting and administrative services.

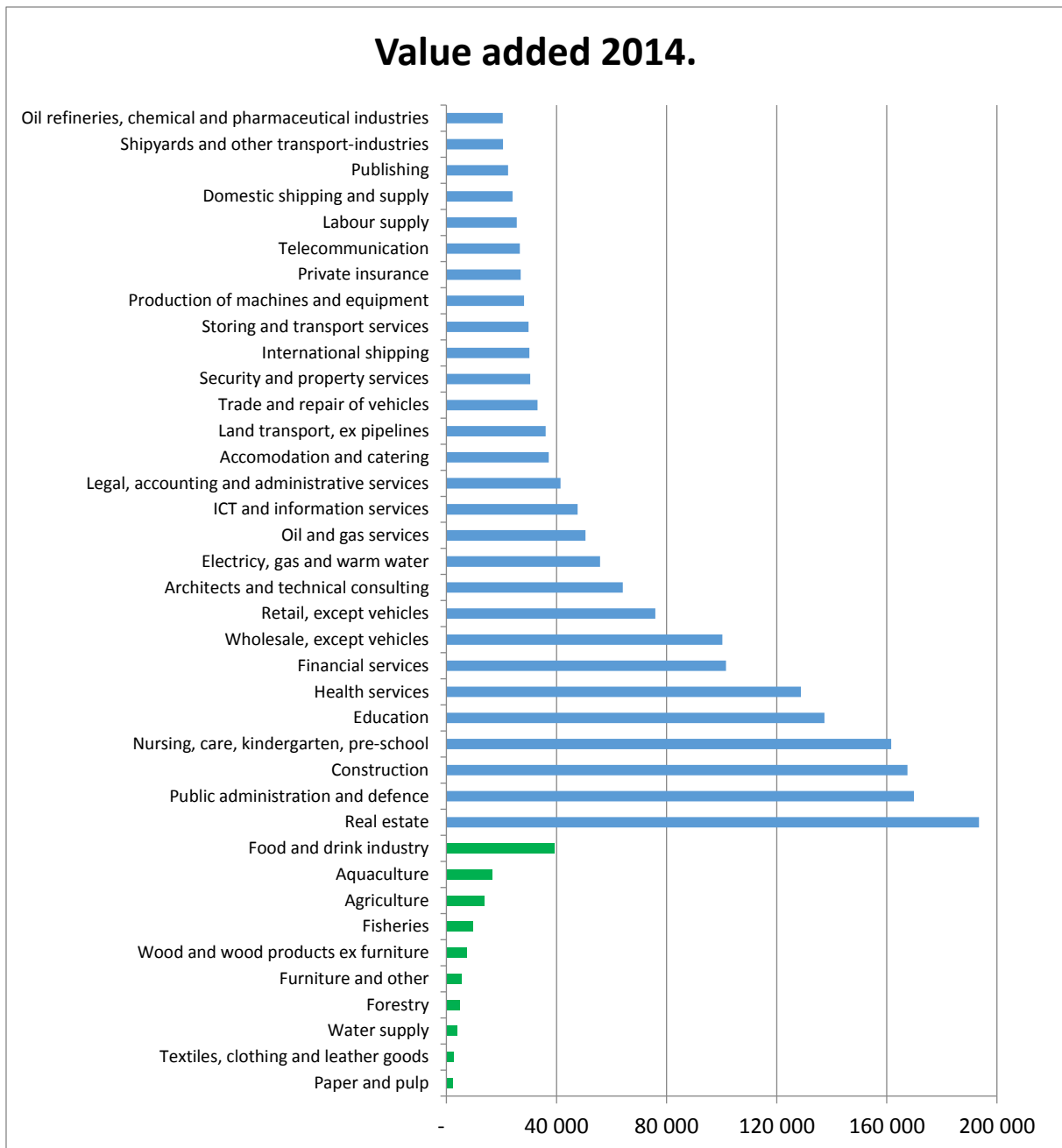


Figure 7: Value added in bioeconomy sectors (green) compared to other selected sectors. Norway 2014. Mill NOK. Source: SSB.

It is not shown in the figure, but the second largest bioeconomy sector, Aquaculture, had value added comparable to that of the industries “Rental and leasing” and “Artistic activities, entertainment and games”. Agriculture had value added comparable to “Activities in member organisations”, and Fisheries to “Production of other non-metal containing minerals”. The comparison with these other non-bioeconomy industries may not inform most people to a large degree, as they generally are not as prominent in Norwegian media as the core bioeconomy industries of fisheries, agriculture and aquaculture are. Another way to compare is to consider the bioeconomy sectors’ share of total national value added. We

see from Table 3 that this is 1.4% for the Food and drink industry. The total share for all the bioeconomy industries in the table was 3.66 % in 2014. For comparison, Real Estate alone was 6.9 %.

Table 3: Bioeconomy sectors' share of total value added in Norway in 2014. Source: SSB.

Industry	Value added share
Paper and pulp	0.08 %
Textiles, clothing and leather goods	0.10 %
Forestry	0.18 %
Furniture and other	0.20 %
Wood and wood products ex furniture	0.26 %
Fisheries	0.35 %
Agriculture	0.49 %
Aquaculture	0.60 %
Food and drink industry	1.40 %
SUM	3.66 %

The sum value added of the Norwegian bioeconomy presented here is a lower bound. A number of sectors defined in the national accounts of Statistics Norway include both bioeconomy and non-bioeconomy industries. We have not had access to detailed data allowing us to identify the bioeconomy part of these mixed sectors, and hence they are not included.

The elements of value added

In addition to the size of the value added itself, different elements of it can also be of interest. Wage costs are the part of value added that goes to the workers. In the figures and tables in this report it includes employers' social contribution¹⁰. The operating surplus show how economically well the sectors' operate from the viewpoint of owners and financiers. Operating surplus in an industry is defined as Value added – Wage costs – Other taxes on production + Other subsidies on production – Consumption of fixed capital. For society, it can also be interesting to what degree an industry is subsidised. Value added, wage costs, operating surplus and subsidies for each bioeconomy sector are shown in Figure 8, with average values for the years 2012 to 2014, measured in running prices. We show this average value rather than values just for one year to reduce the impact of yearly variation that is evident from the time series. In Figure 10 the elements are shown as shares of value added, and in Figure 19 as shares of revenues. When value added is a relatively small share of revenues it means that material inputs from other industries are relatively large.

We see that in absolute terms the wage costs of the Food and drink industry is much larger than for any other industry. As share of value added it is also among the largest ones, with 69 %. But all of the manufacturing industries have wage costs as a large share of value added, from 63 to 82 %.

¹⁰ In Statistics Norway's definition it is called Compensation of employees, and is equal to Wages and salaries + Employers' social contribution.

In the primary industries the statistics show wage costs to be relatively much smaller shares of value added, and operating surplus conversely much larger shares. This is for different reasons in the different primary industries. In farming in Agriculture and in Forestry it is common to be self-employed, and the operating surplus can thus be said to cover the labour input to a large degree than in companies where most of the labour force is hired. The base for the agricultural statistics is to a large degree tax statistics for persons, including farms run by persons, rather than companies¹¹. In 2012, over 42 000 out of nearly 44 800 farms were run by persons rather than companies. This makes it difficult to for example distinguish between private debt and debt related to running the farms in the statistics. Most farmers also have other income to a substantial degree. In 2012, the income from the farms made up 29 % of the gross income of the farmers.

In forestry, which also is dominated by self-employed persons, the income from forestry on average only made up 7 % of the persons' gross income¹². A special institution, the "Forest Fund Arrangement" ("Skogfondordningen"), also reduces the official taxable income of persons who are forest owners.

In Fisheries, it is common that the crew fishermen receive a share of the operating surplus as their pay ("lott", in Norwegian), explaining in part why the operating surplus is a large share of value added also here. In Aquaculture, however, the average profit margin has been very high the latter years, giving high profits to the owners. The export price of Salmon rose from 26-29 NOK/kg at the beginning of 2012 to about 42 NOK/kg at the end of 2014¹³. While the production costs in salmon farming rose during this period, in large part to deal with the salmon lice problem (Iversen et al. 2015), the export price rose much more (Fisheries Directorate 2016). The salmon price has continued to rise, and passed 70 NOK/kg in May 2017.

¹¹ See <https://ssb.no/en/jord-skog-jakt-og-fiskeri/statistikker/binfo>

¹² See <https://ssb.no/en/jord-skog-jakt-og-fiskeri/statistikker/skoginnt/aar/2016-02-18>

¹³ Salmon export price statistics: <https://www.ssb.no/en/utenriksokonomi/statistikker/laks>

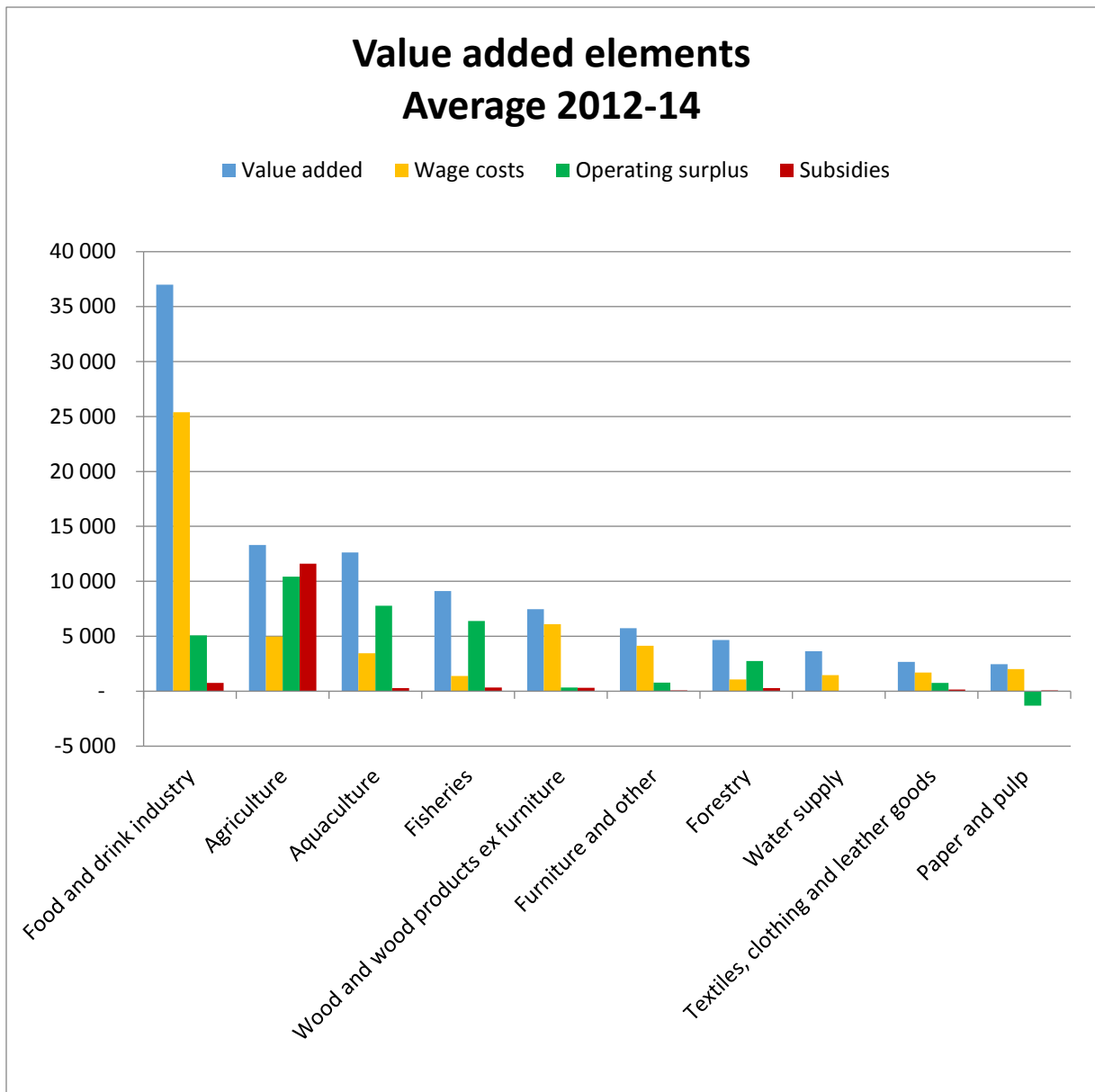


Figure 8: Average value added, wage costs, operating surplus and subsidies 2012-14 in bioeconomy sectors in Norway. Mill NOK (current prices). Source: SSB

When it comes to subsidies, Agriculture is dominating, both in absolute and relative terms. Agriculture received an average of 11.6 Billion NOK per year 2012-14. This made up 87 % of the industry's average value added, and 35 % of the average revenue. The agricultural subsidies are large to support several national interests, including national food security, regional policy and sustainability, including a cultivated cultural landscape (Meld. St. 11 2016-17).

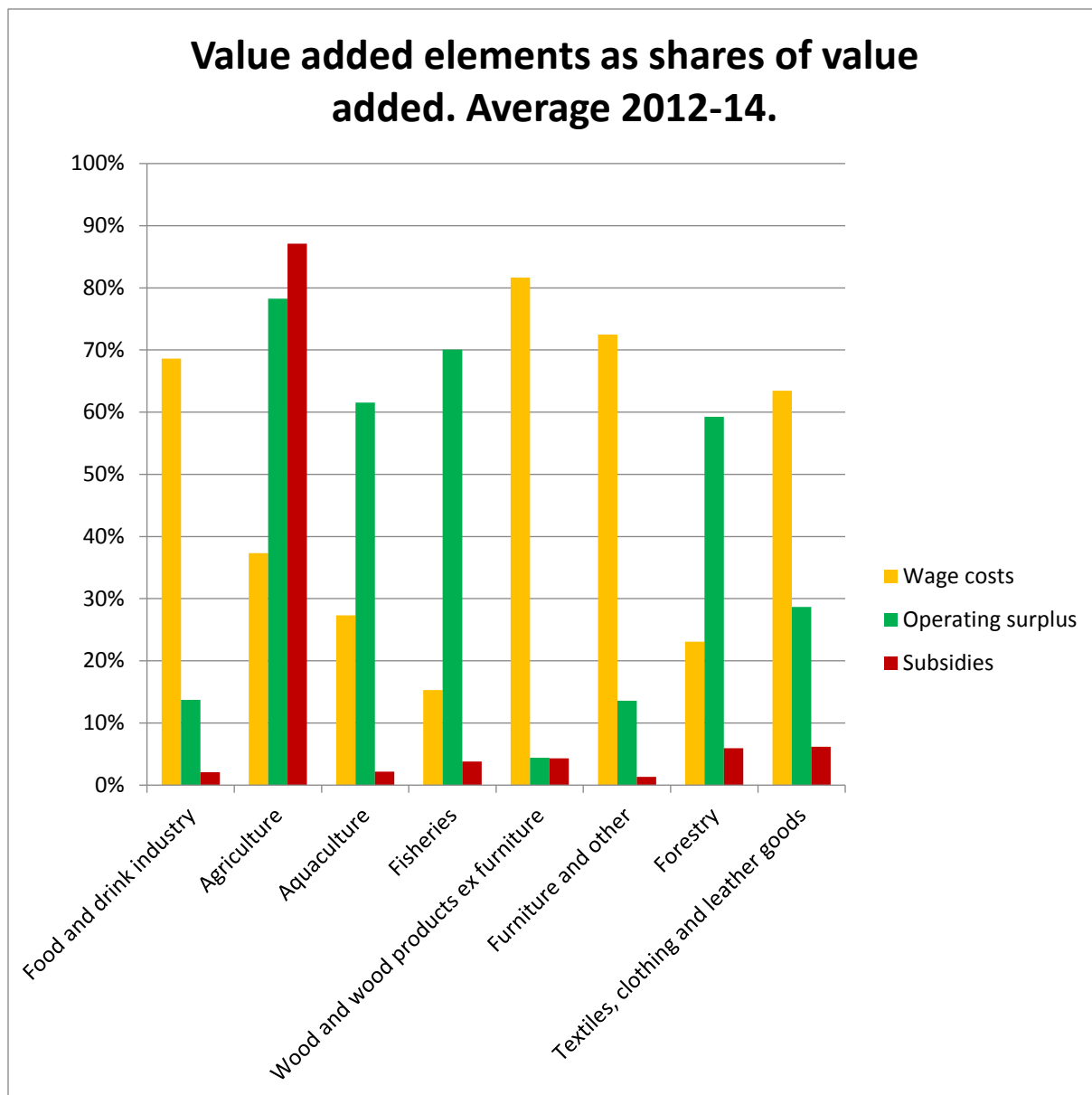


Figure 9: Elements of value added as shares of value added. Source: SSB.

In Figure 10 we have left out the Paper and pulp industry to make the diagram easier to read. This industry in Norway has had very poor economic results the latter years. While the wage costs were 82 % of the value added, the operating surplus was minus 53 %. Subsidies were 3 %.

Considering value added as share of revenues we see that in particular for Fisheries and Forestry it is very large, at over 60 %, indicating relatively small material inputs from other industries. At the other end of the scale is the Food and drink industry, where value added is only 21 % of revenues.

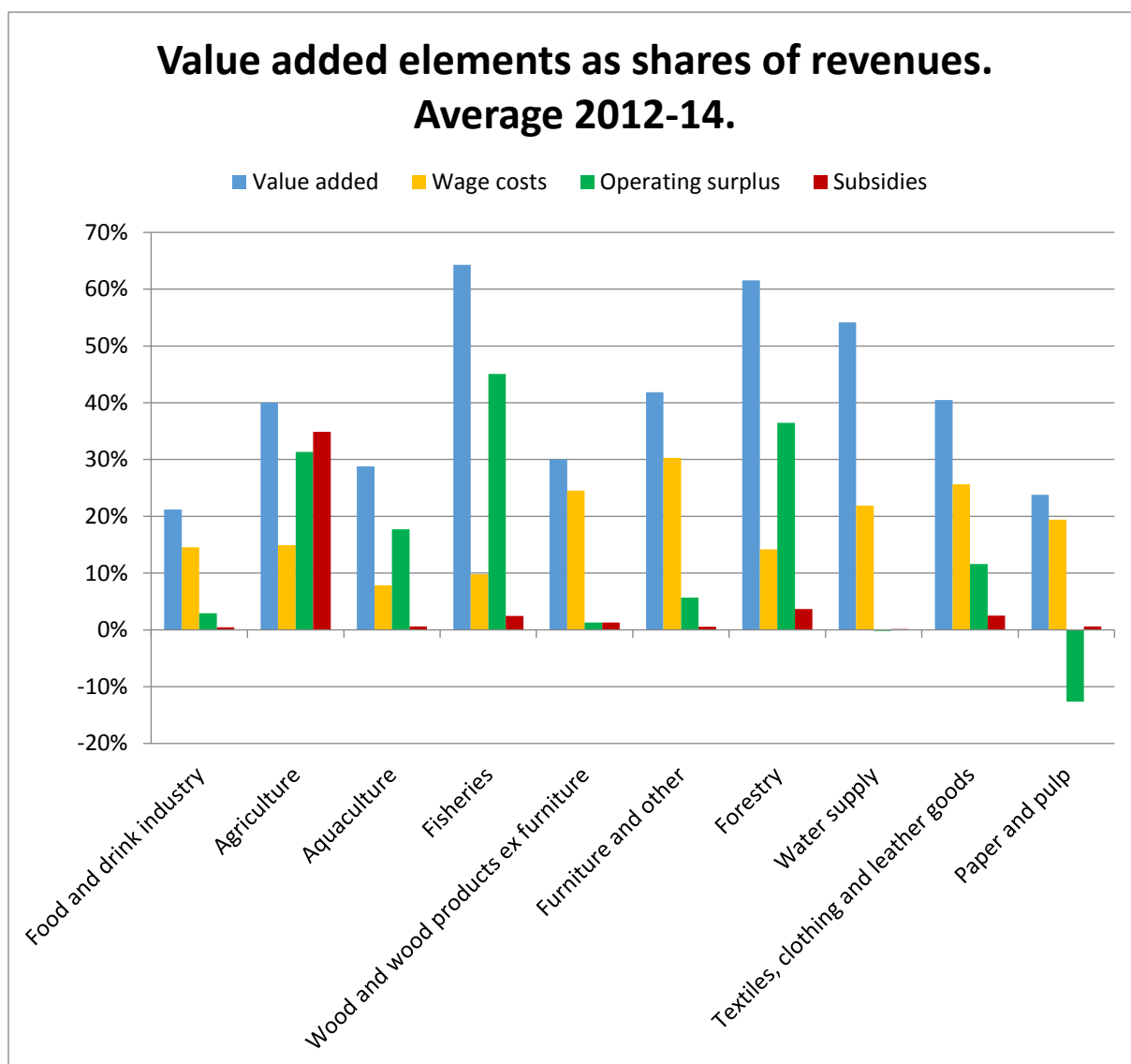


Figure 10: Elements of value added as shares of revenues. Average 2012-14. Source: SSB.

The total wage costs for the sum of the bioeconomy sectors we consider have increased in the period 2008-2014, when measured in running prices, as can be seen from the Figures below. The general inflation in Norway between 2008 and 2014 were 11.3 % (ssb.no/kpi). With wage costs going from 45.5 to 51.5 billion NOK in this period, the increase is slightly higher than the general inflation.

The Food and drink industry (Food production, beverages and tobacco) has had a larger relative increase in the wage costs than the bioeconomy industries in sum.

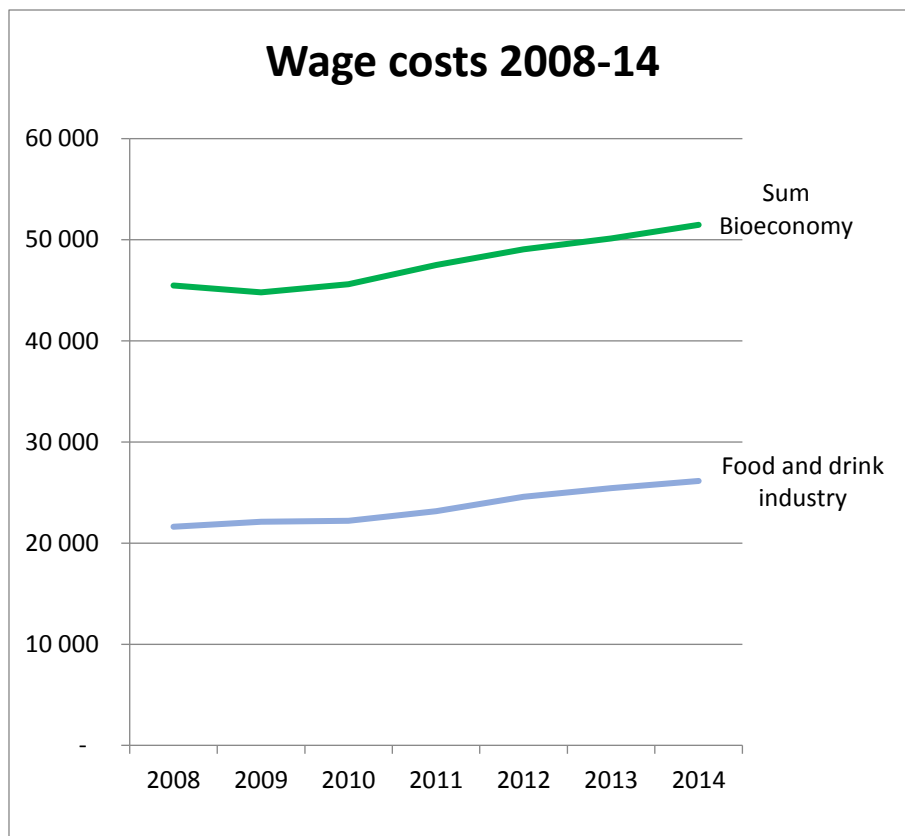


Figure 11: Wage costs 2008-14 in selected bioeconomy industries. Running Mill NOK
Source: SSB.

We see that several of the industries had a reduction in wage costs from 2008 to 2009. This is likely due to the financial crisis of that period. The industries that were exceptions to this were Food and drink, Aquaculture and Fisheries. Considering the whole period 2008-14 most industries have had an increase in wage costs. Agriculture has had an increase of more than 20 %, Aquaculture 100 %, and Fisheries nearly a 40 % increase. Furniture etc. and Paper and pulp have on the other hand seen reductions of 13 % and 43 % respectively.

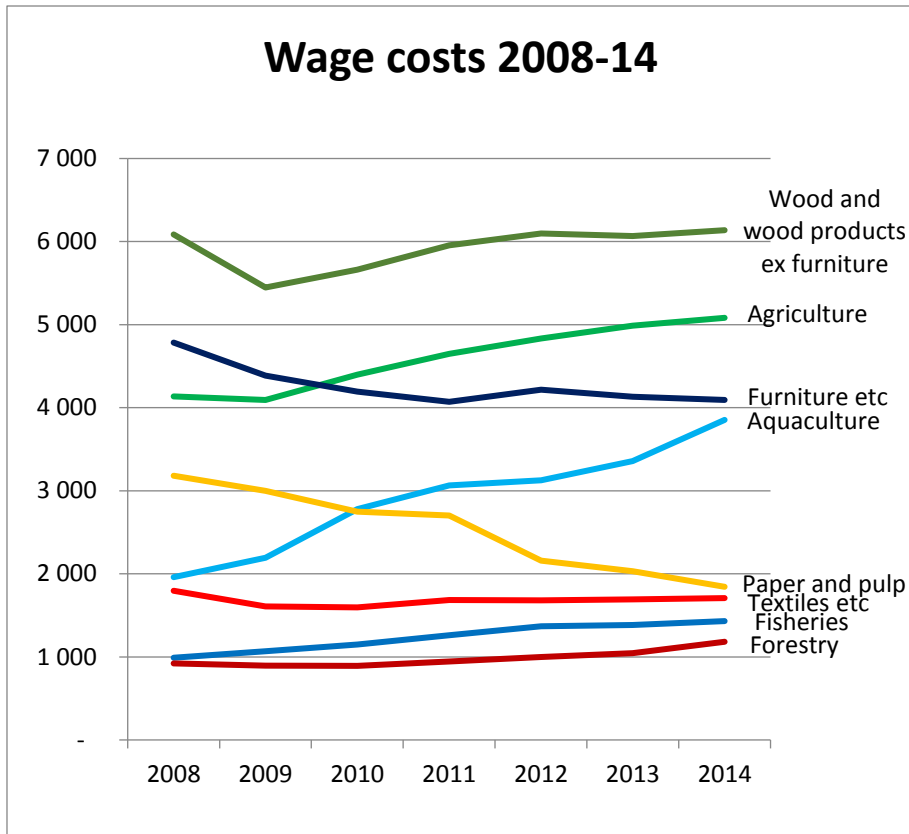


Figure 12: Wage costs 2008-14 in selected bioeconomy industries. Running mill NOK
Source: SSB.

The operating surplus has shown more variation than the wage costs in the period 2008-14. Following a reduction from 2008 to 2009 the surplus increased a lot from 2009 to 2010. It then fell strongly again for two years before it again grew markedly from 2012-14.

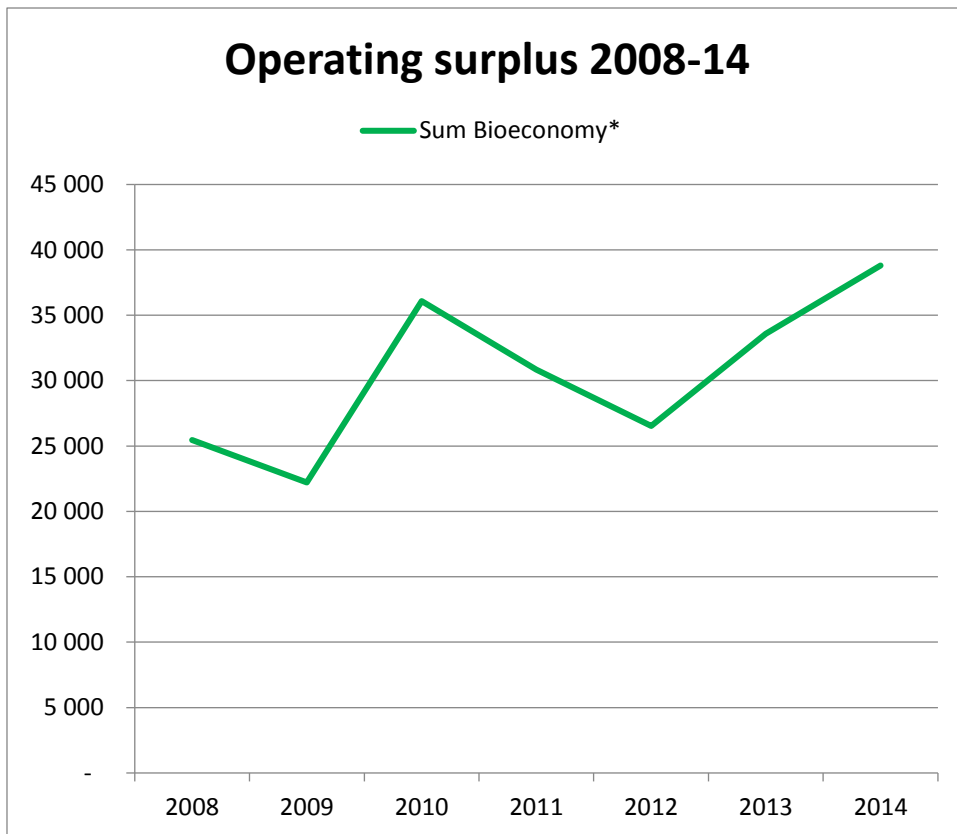


Figure 13: Operating surplus 2008-14 in selected bioeconomy industries. Running mill NOK
Source: SSB.

Of the major core bioeconomy industries, the operating surplus in Agriculture has been relatively stable, but in Fisheries and Aquaculture the volatility has been large. Both these marine sectors have seen strong fluctuations. There seems to be some tendency to their operating surpluses behaving counter-cyclic to each other, but this is probably more incidental than part of a systematic pattern.

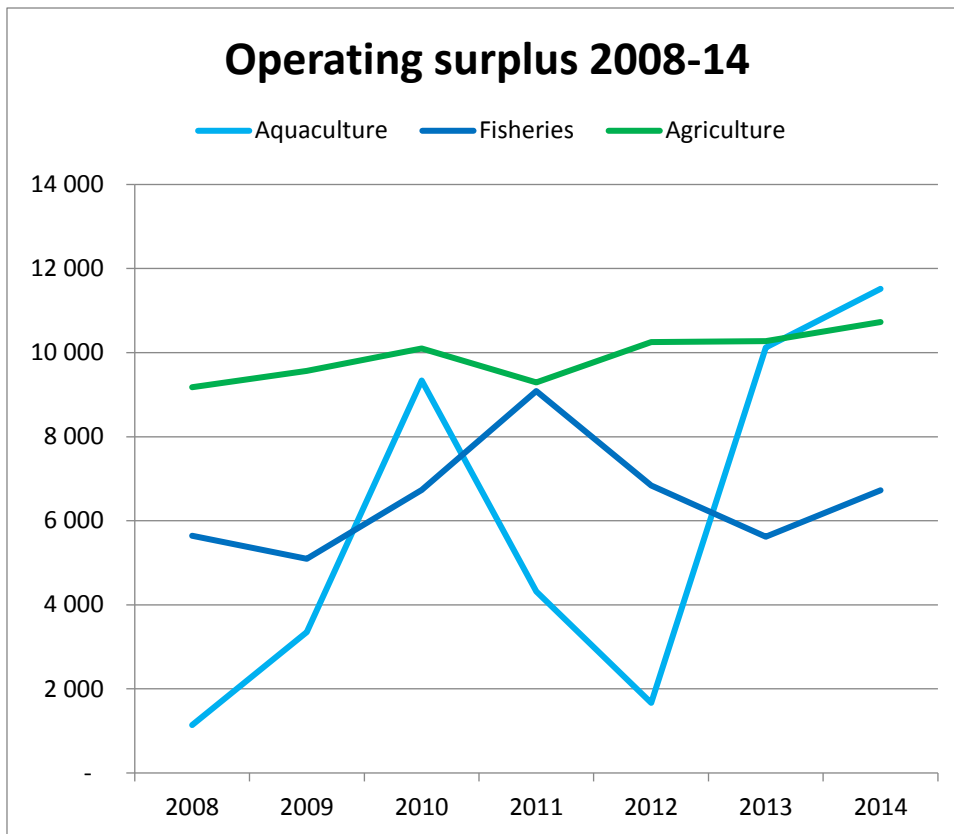


Figure 14: Operating surplus 2008-14 in selected bioeconomy industries. Running mill NOK
Source: SSB.

For all of the industries in Figure 15, the operating surplus fell from 2008 to 2009, and grew from 2009 to 2010. In absolute value the variation in the surplus over the years has been largest for the Food and drink industry. However, the overall trend of this industry for the whole period 2008-14 is slightly upward. For the Forestry industry the opposite is the case; the trend have been downward. Note that the surplus for the Paper and pulp industry has been negative all these years.

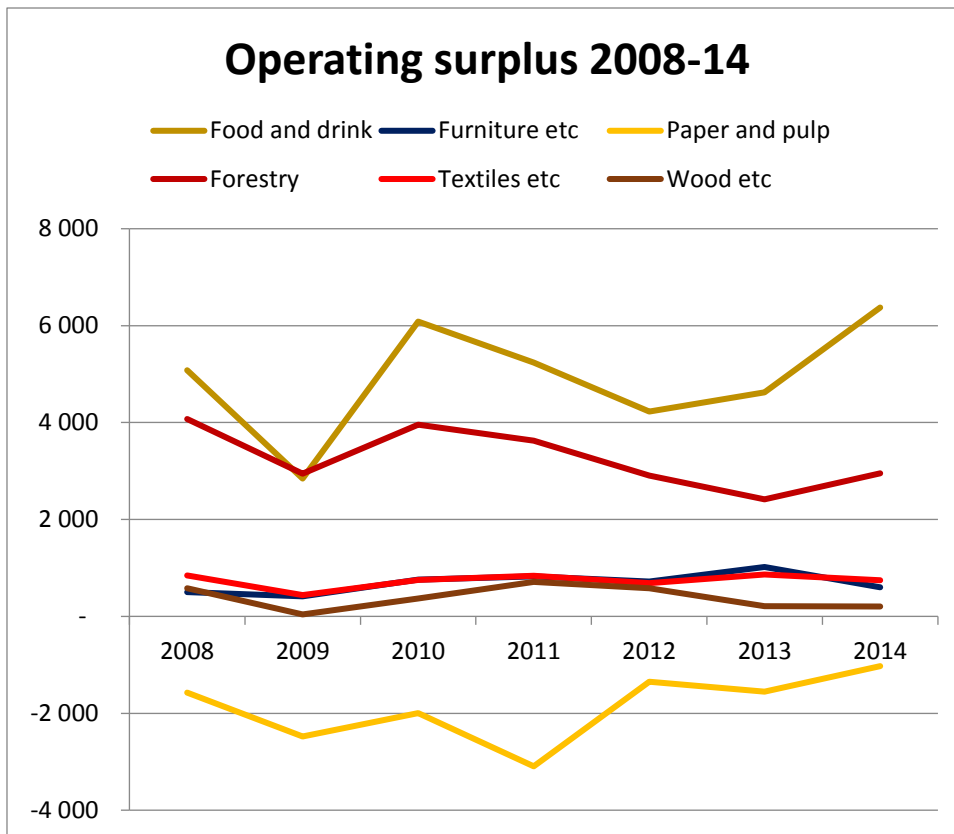


Figure 15: Operating surplus 2008-14 in selected bioeconomy industries. Running mill NOK
Source: SSB.

The sum of subsidies to the bioeconomy industries we consider here is dominated by what goes to the Agriculture sector, and so it has been for the whole period 2008-14. Out of 12-14 Billion NOK in subsidies, 10-12 Billion NOK goes to Agriculture. There has been a ca 20 % increase in the subsidies over these years, which should be considered against the general inflation of about 11 %.

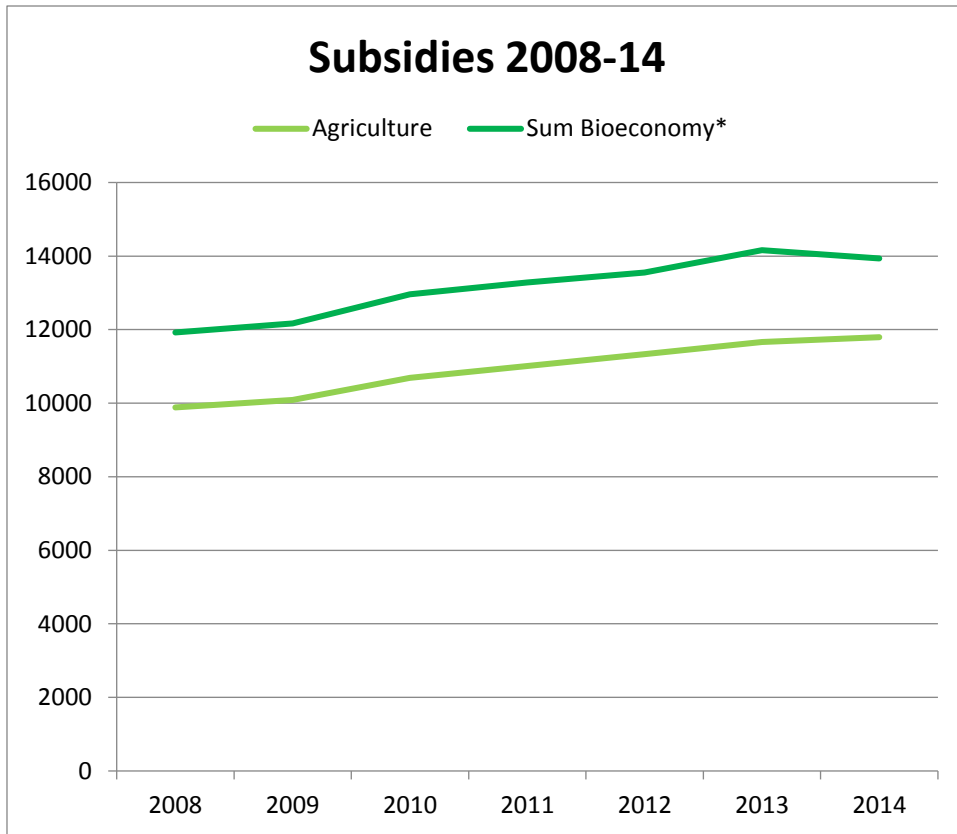


Figure 16: Subsidies 2008-14 in selected bioeconomy industries. Running mill NOK. Source: SSB.

In relative terms, the subsidies to the Fisheries sector have been reduced a lot between 2013 and 2014, as can be seen in Figure 17. For all of the industries Fisheries, Food and drink, Forestry and Wood and wood products the subsidies were cut from 2013 to 2014. For the years before that, 2008-2013, the trend was a slight increase in in subsidies.

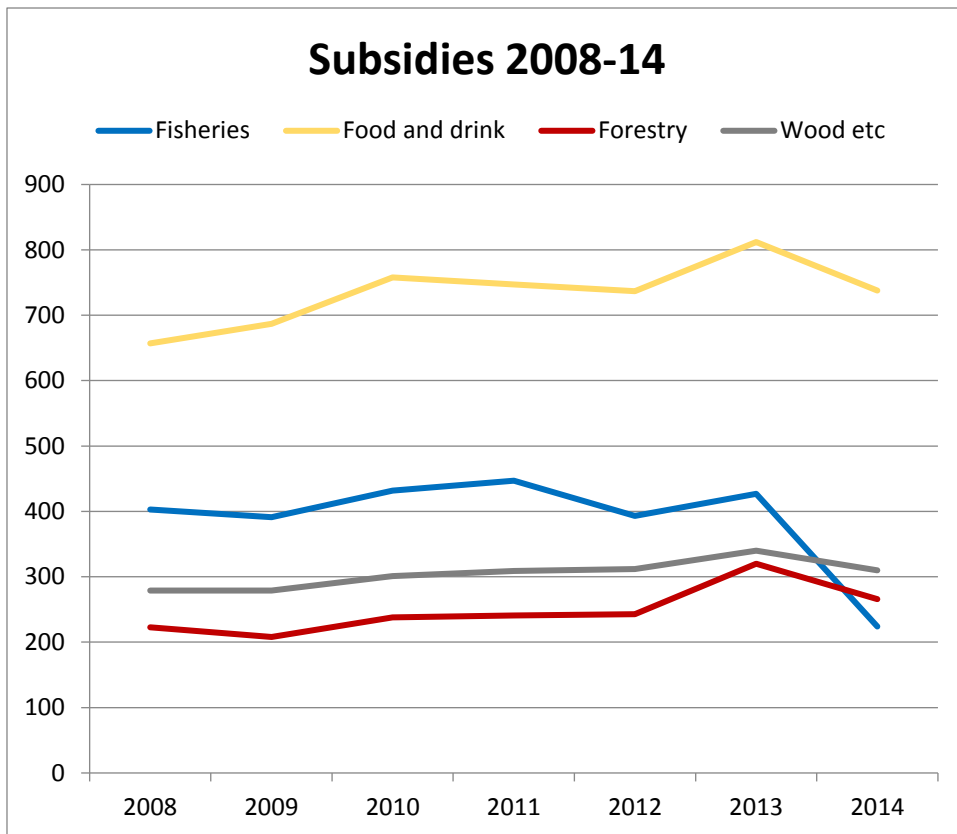


Figure 17: Subsidies 2008-14 in selected bioeconomy industries. Running mill NOK Source: SSB.

While Aquaculture, Textiles and Paper and pulp have had a trend of increased subsidies over the years, including from 2013 to 2014, the Furniture industry saw a cut from 2013 to 2014, and have had a reduction in subsidies when considering the inflation.

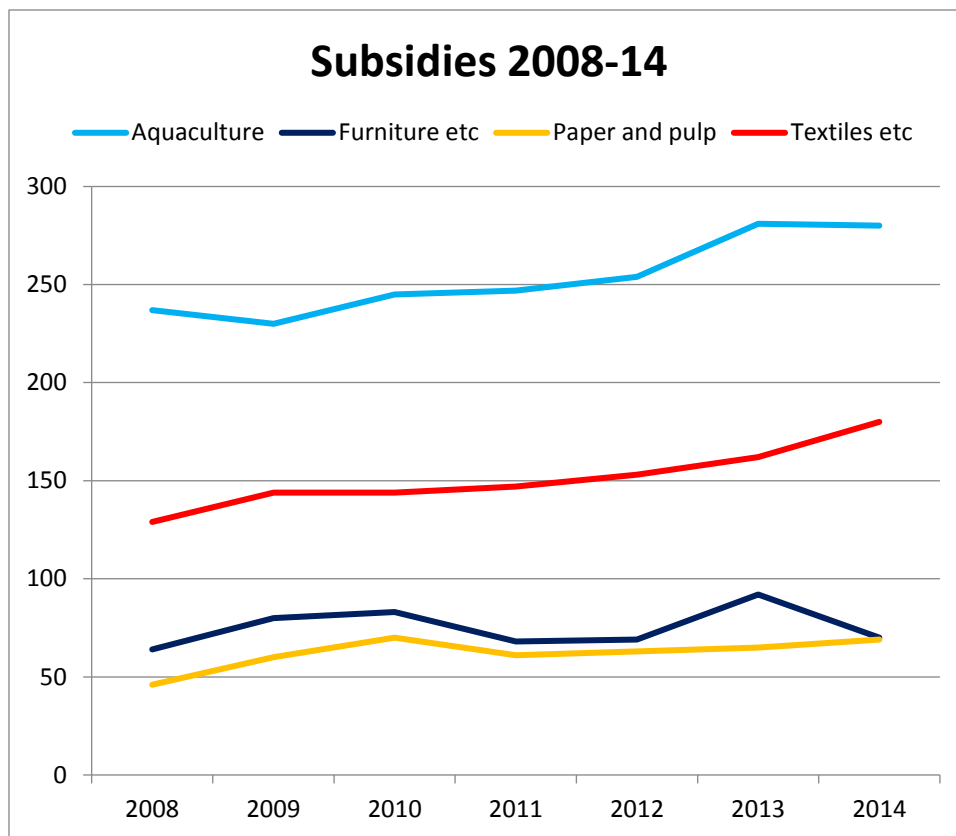


Figure 18: Subsidies 2008-14 in selected bioeconomy industries. Running mill NOK Source: SSB.

Regional distribution of the bioeconomy

Different regions and counties of Norway have very different production in the different bioeconomy sectors (Falk-Andersson et al. 2016). This is also the case for the value added from the bioeconomy. There are both large differences in the total value added from the bioeconomy sectors for each county and in the relative contribution of the various sectors, as can be seen from Figure 19. Møre and Romsdal has the biggest sum value added, followed by Nordland and Hordaland. All these have large value added in the Fishing and aquaculture sector, as well as Food production, beverages etc.

The fourth largest county is Rogaland. It has a larger Agriculture and forestry industry than the top three counties, but the total value added in the core bioeconomy sectors (Agriculture + Forestry + Fishing + Aquaculture) is clearly smaller than for the top three. However, the Food production, beverages etc. industry in Rogaland has the largest value added of this industry in all the counties. Sør-Trøndelag has the fifth largest value added. Like Rogaland it has sizeable both terrestrial and marine core bioeconomy industries and a large Food production, beverages etc. Hedmark is the sixth biggest bioeconomy county in terms of value added. Being landlocked it has practically no Fisheries and Aquaculture, but it is number one in value added in Agriculture and forestry. Troms is county number seven in

bioeconomy value added, but the value added in the core bioeconomy sectors is the fourth largest in the country, mainly due to a large Fisheries and aquaculture industry.

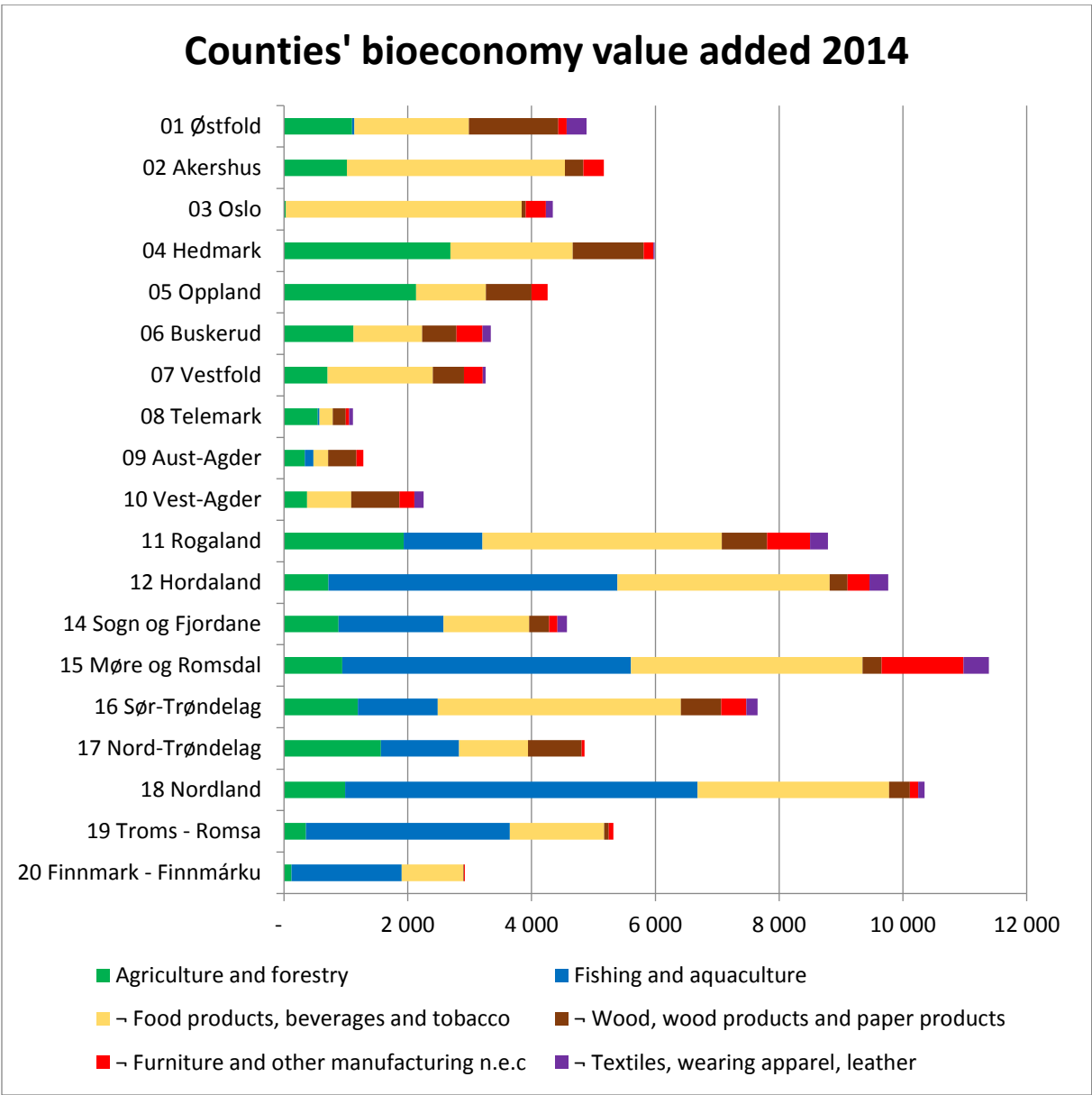


Figure 19: Value added in bioeconomy industries in regions of Norway 2014. Mill NOK. Source SSB.

The sizes of the counties vary a lot, both in terms of area, population and total value added. The value added of the bioeconomy industries compared to the counties' total value added says something about the relative importance of the bioeconomy there, and also something about the counties' vulnerability to changes in the bioeconomy industries. As can be seen from Figure 20, the value added from the major bioeconomy industries (from

Table 6) was between 1 % and 11.5 % of the counties total value added in 2014. The counties most dependent on bioeconomy industries are Nordland, Nord-Trøndelag, Sogn og Fjordane, Finnmark, Møre og Romsdal, and Hedmark, in that order. They all had more than 9.5 % of their value added from these bioeconomy industries. For Mainland Norway (not including Oil and Gas production) the value added of the bioeconomy industries here are 4.5 % of the total value added. When including oil and gas production the value added of the bioeconomy industries here make up only 3.7 % of all value added.

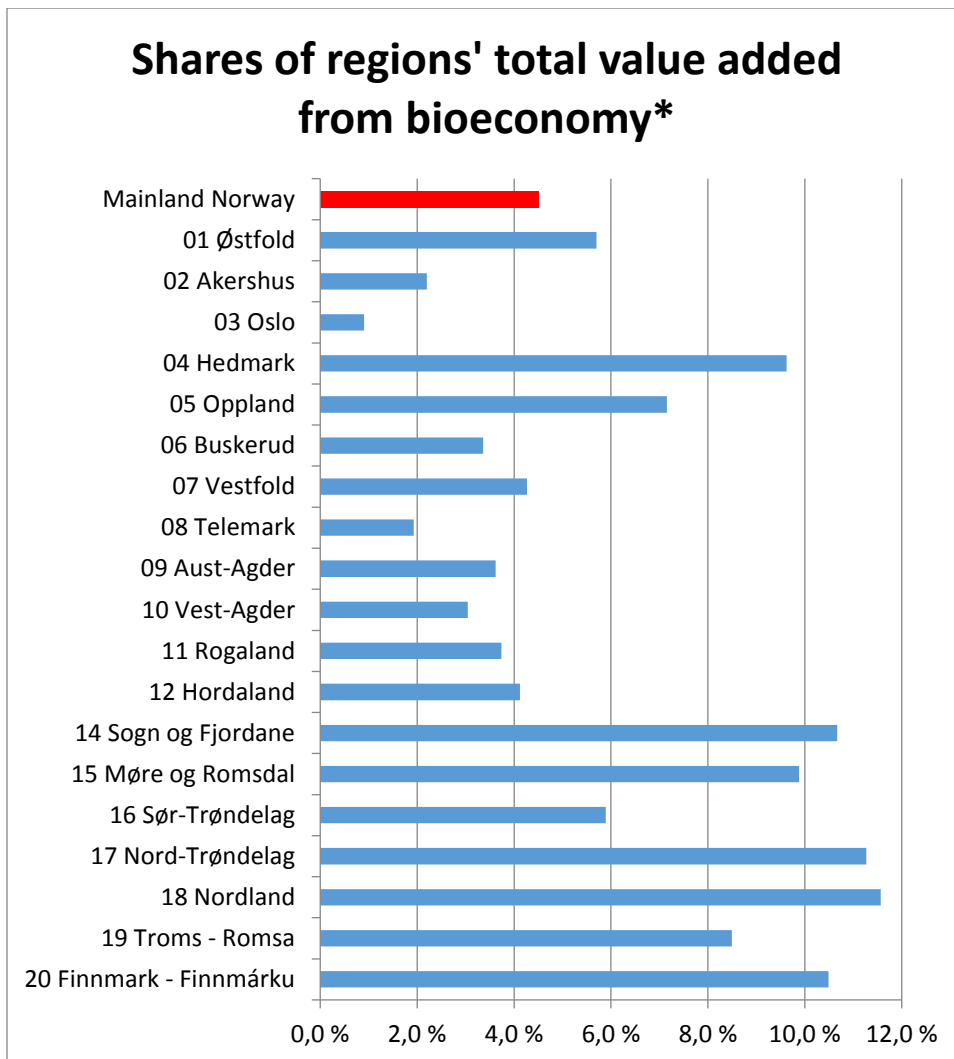


Figure 20: Share of regions' total value added coming from major bioeconomy sectors in 2014. Source SSB.

*) Sum share from the bioeconomy industries listed in Feil! Fant ikke referanseilden..

The counties' value added is presented separately for each bioeconomy sector in Figure 21 to Figure 23. All of the diagrams have the same scale on the value axes, so the length of the

bars is comparable across these diagrams. The value added in the industries is also presented in maps later.

The Food products, beverages and tobacco industries have a value added up to nearly 4000 Mill NOK in some counties. Seven counties have a value added between 2000 and 4000 Mill NOK.

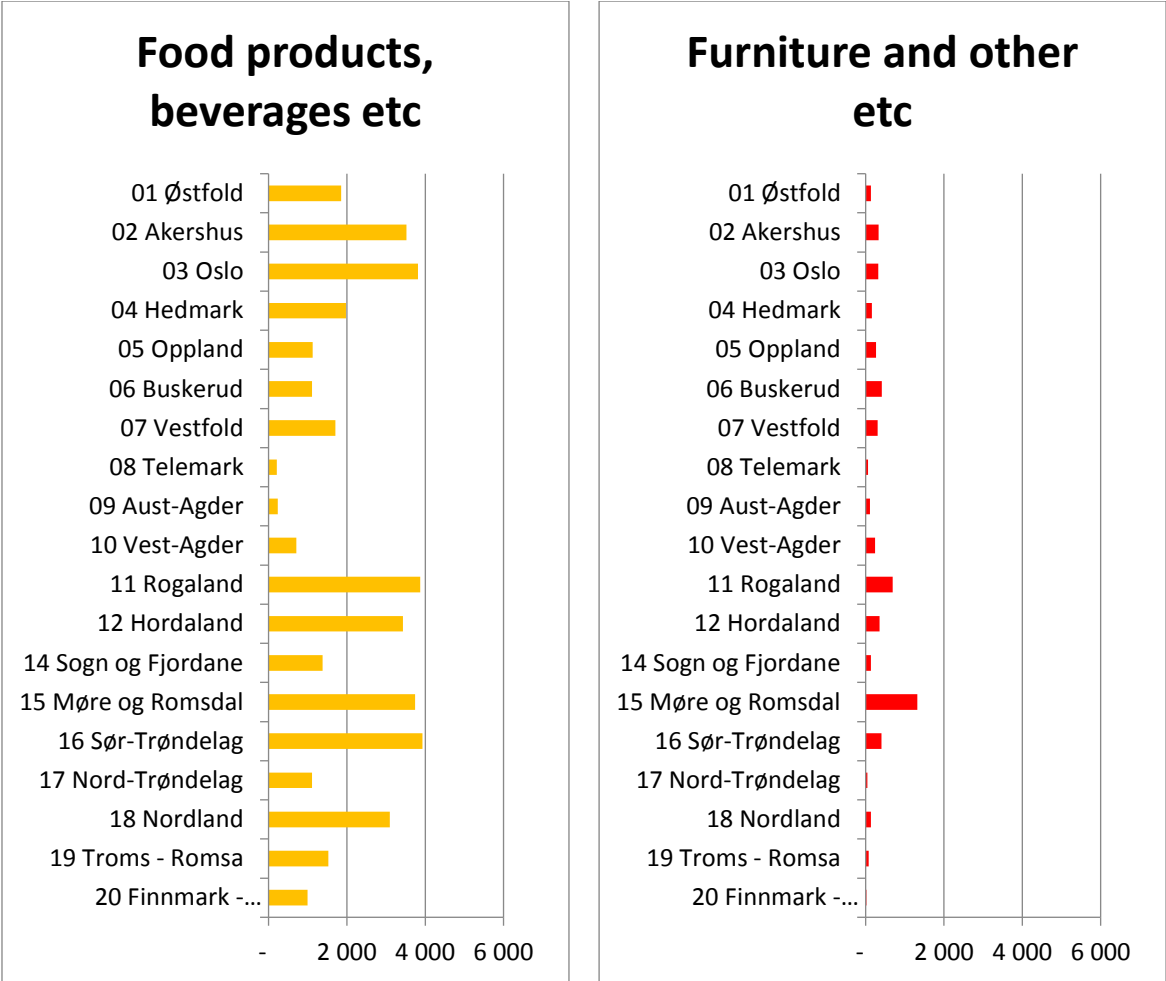


Figure 21: Value added in bioeconomy industries in regions of Norway 2014. Mill NOK. Source SSB.

The “Furniture and other manufacturing not found elsewhere” industry has a much lower overall value added than the Food products, beverages etc. industry, as we have seen earlier. There were only two counties where the value added was larger than 500 mill NOK in 2014. Møre og Romsdal had just over 1300 mill NOK, and Rogaland just below 700 mill NOK.



Figure 22: Value added in bioeconomy industries in regions of Norway 2014. Mill NOK. Source SSB.

The Textiles, wearing apparel and leather goods industries has even smaller value added than the furniture etc. industry. In Møre og Romsdal the Textiles etc industry had 410 mill NOK in value added in 2014, while in Hordaland, Østfold and Rogaland the industry had value added of around 300 mill NOK each.

The Wood, wood products and paper products industries had a value added in 2014 of more than 1000 mill NOK in Østfold (1442) and Hedmark (1148). Several counties had value added between 500 and 900 mill NOK.

Agriculture and forestry had the largest value added in Hedmark with nearly 2700 mill NOK, followed by Oppland with ca 2100 mill NOK and Rogaland with ca 1900 mill NOK. Five other counties had a value added larger than 1000 mill NOK; Nord-Trøndelag, Sør-Trøndelag, Buskerud, Østfold and Akershus, in that order. Nordland, Møre og Romsdal and Sogn og Fjordane all had between 880 and 990 mill NOK in value added from these industries in 2014.

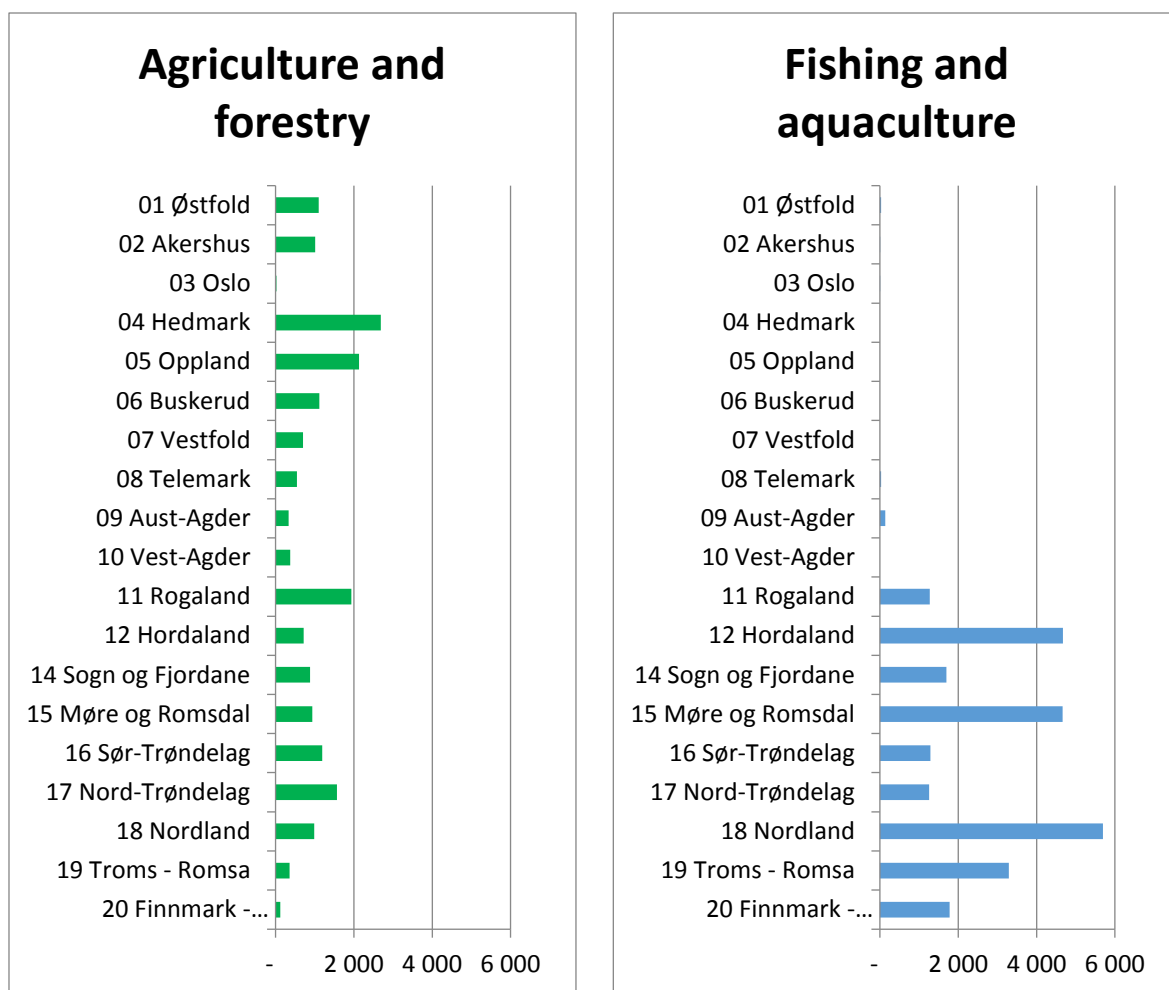


Figure 23: Value added in bioeconomy industries in regions of Norway 2014. Mill NOK. Source SSB.

While the value added from Agriculture and forestry is evenly distributed among Norwegian counties, with only five counties having less than 500 mill NOK in 2014, the distribution is much more skewed for Fishing and aquaculture. There, three counties had more than 4600 mill NOK in value added in 2014. Nordland had nearly 5700 mill NOK, while Hordaland and Møre og Romsdal both had ca 4700. Troms had almost 3300 mill NOK. Five other counties had between 1800 and 1200 mill NOK in value added from these industries; Finnmark, Sogn og Fjordane, Sør-Trøndelag, Rogaland, and Nord-Trøndelag, in that order. The remaining ten counties had just over 200 mill NOK in value added between them.

Maps of value added in bioeconomy industries in the Norwegian counties

The following maps give an alternative illustration of the regional variation in value added in the various bioeconomy industries in 2014. Each of the five colours of the coding represents a range covering 20% of the overall range of value added. The value added of the county with the highest value added vary from industry to industry. Hence, so does the value added range in each figure.

(Figure 24) shows where the different Norwegian counties are located.

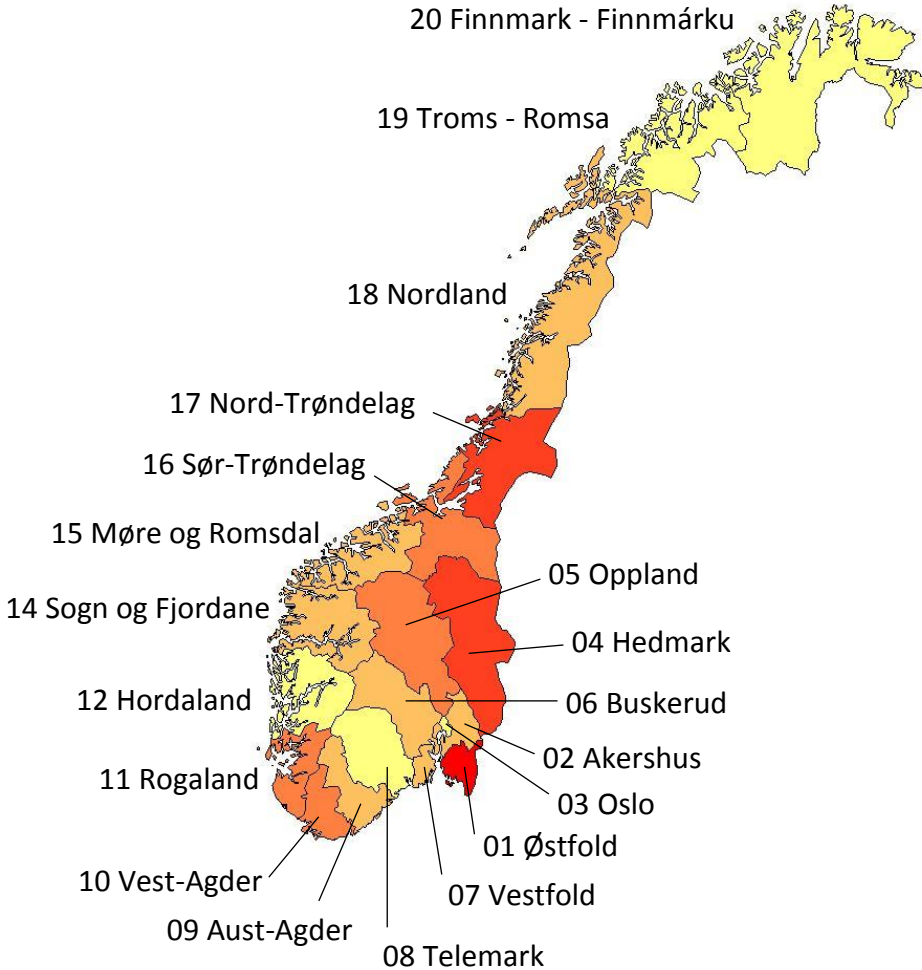


Figure 24: Location of the Norwegian counties. Source SSB/Norwegian Mapping authority/ Norut.

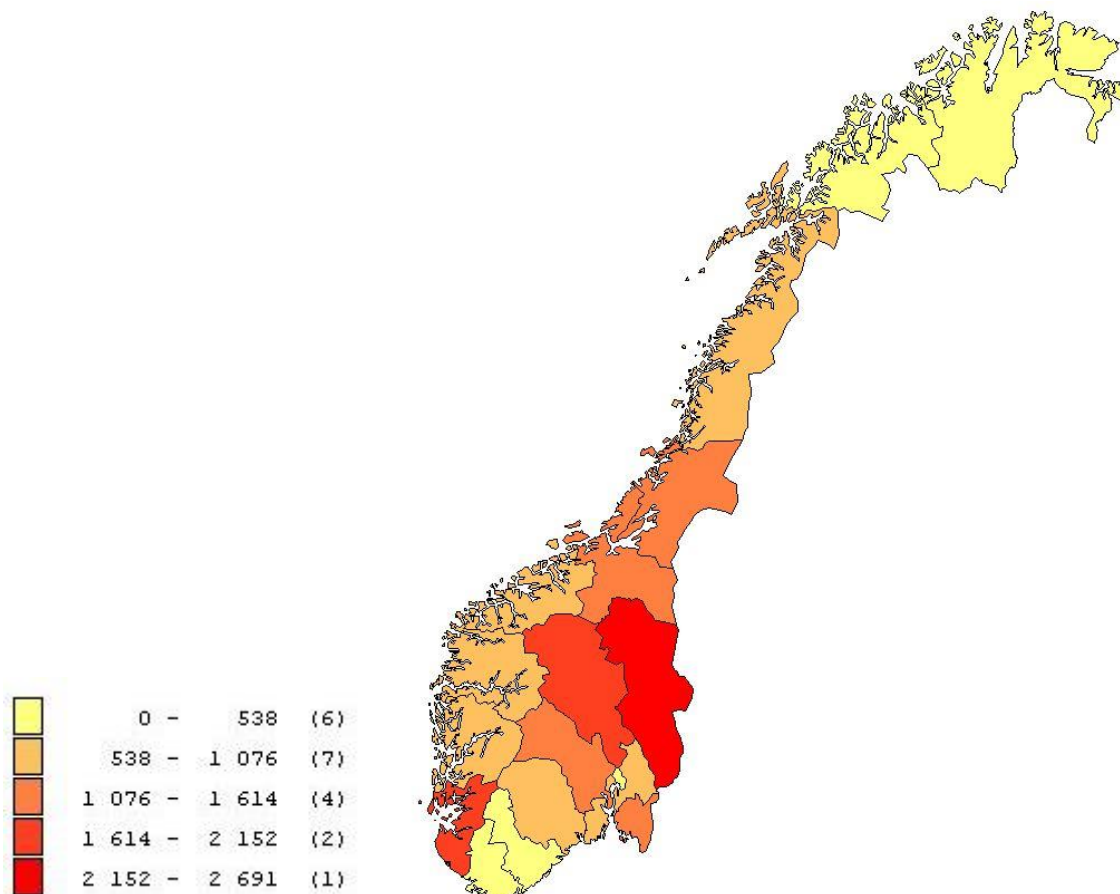


Figure 25: Value added in Agriculture and forestry in 2014 by county. Mill NOK. Data source: SSB; Map data: Norwegian Mapping Authority

The counties with the largest value added in Agriculture and forestry are inland in the south to middle part of Norway, as well as Rogaland on the southwestern coast.

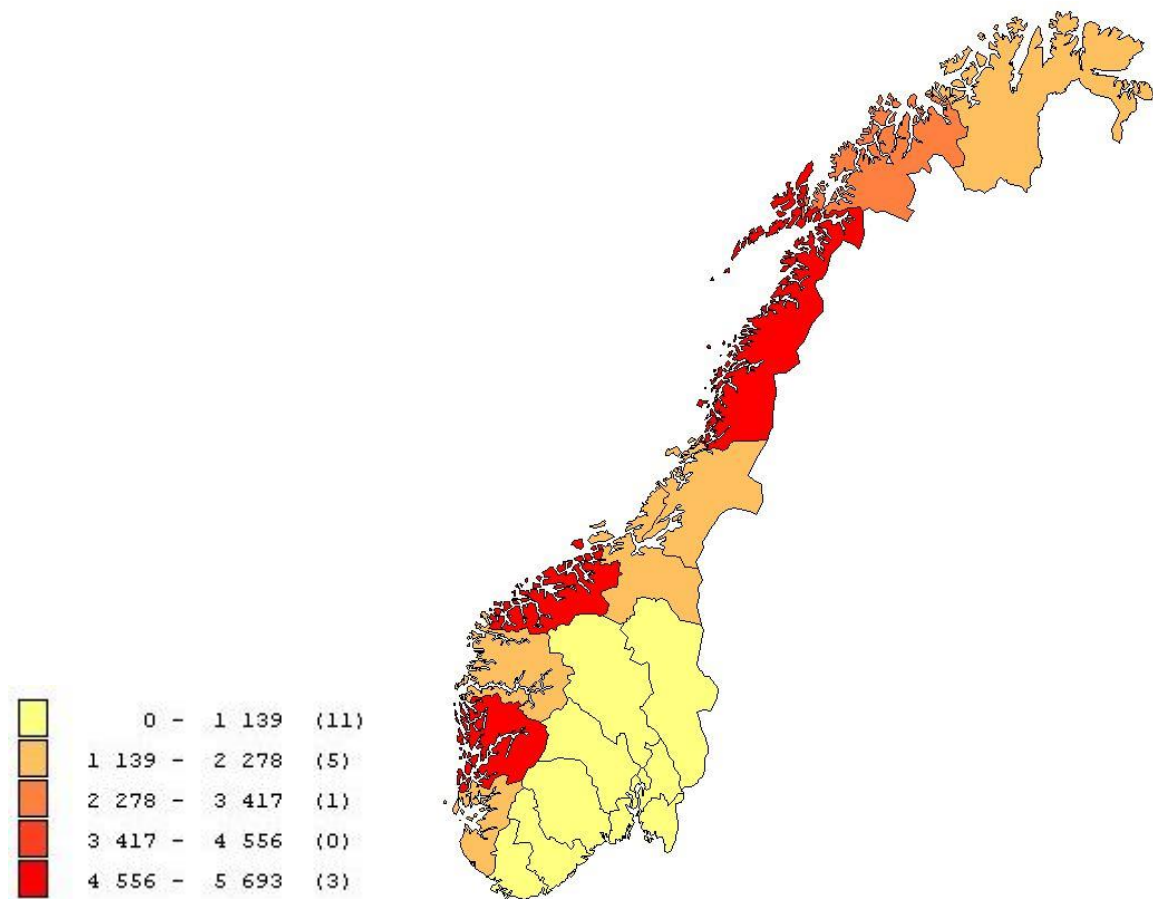


Figure 26: Value added in Fisheries and Aquaculture in 2014 by county. Mill NOK. Data source: SSB; Map data: Norwegian Mapping Authority

The counties with the largest value added in Fisheries and aquaculture are the coastal counties on the middle and northern parts of Norway.

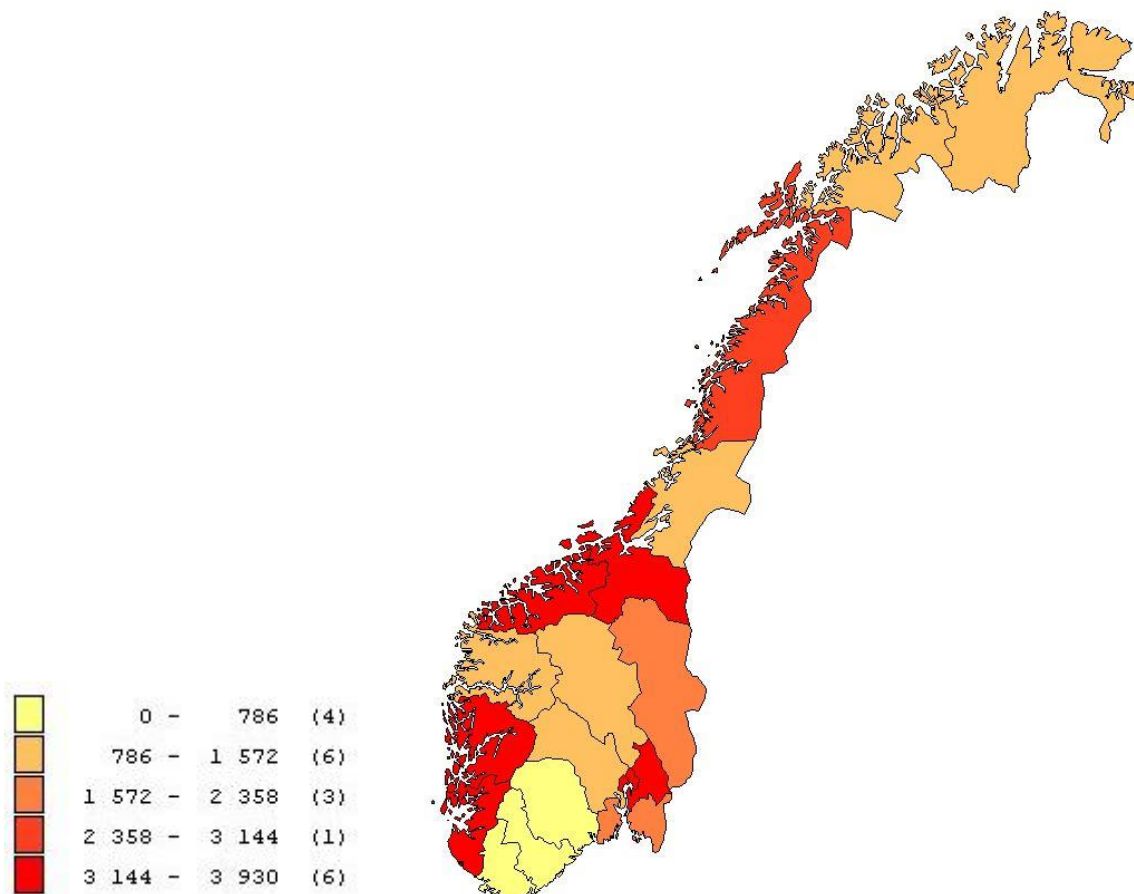


Figure 27: Value added in Food production, beverages and tobacco industry in 2014 by county. Mill NOK. Data source: SSB; Map data: Norwegian Mapping Authority

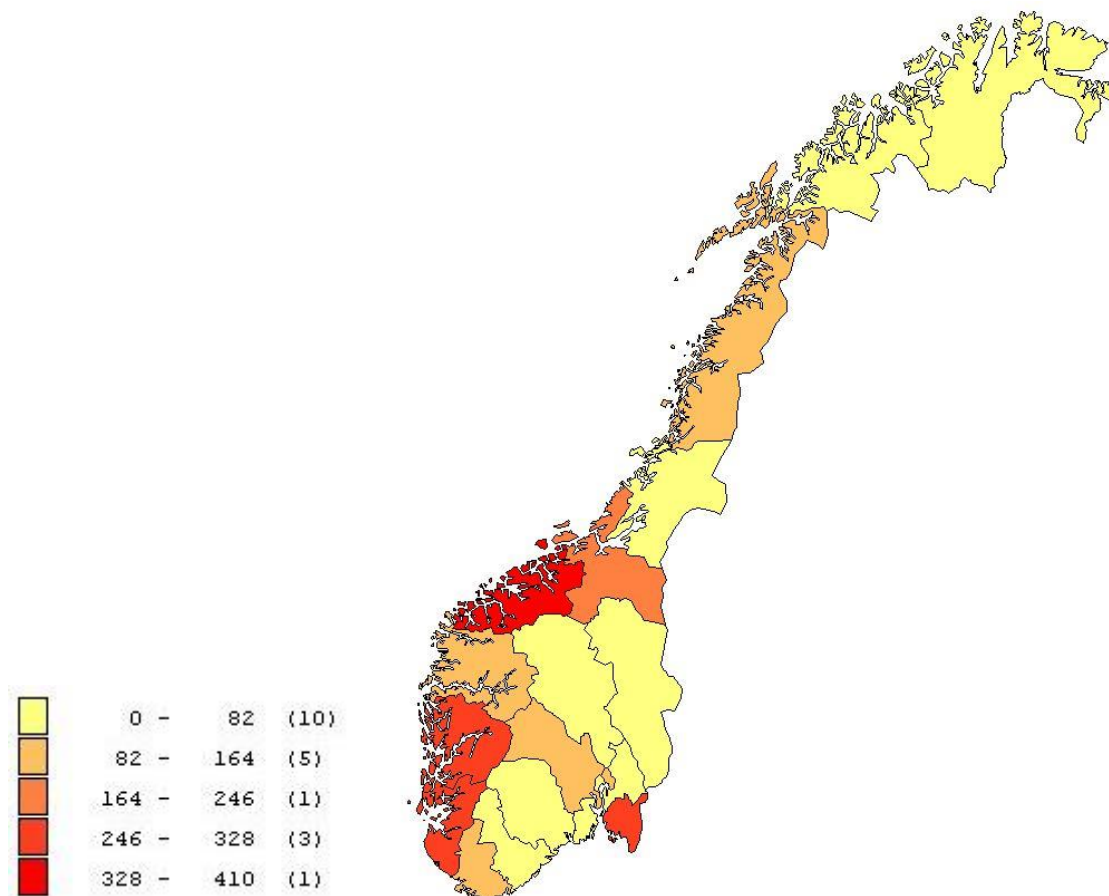


Figure 28: Value added in Textile, wearing apparel and leather goods industry in 2014 by county. Mill NOK. Data source: SSB; Map data: Norwegian Mapping Authority

The Textile, wearing apparel and leather goods industry has a limited overall value added in Norway. The county with the highest value added is Møre og Romsdal.

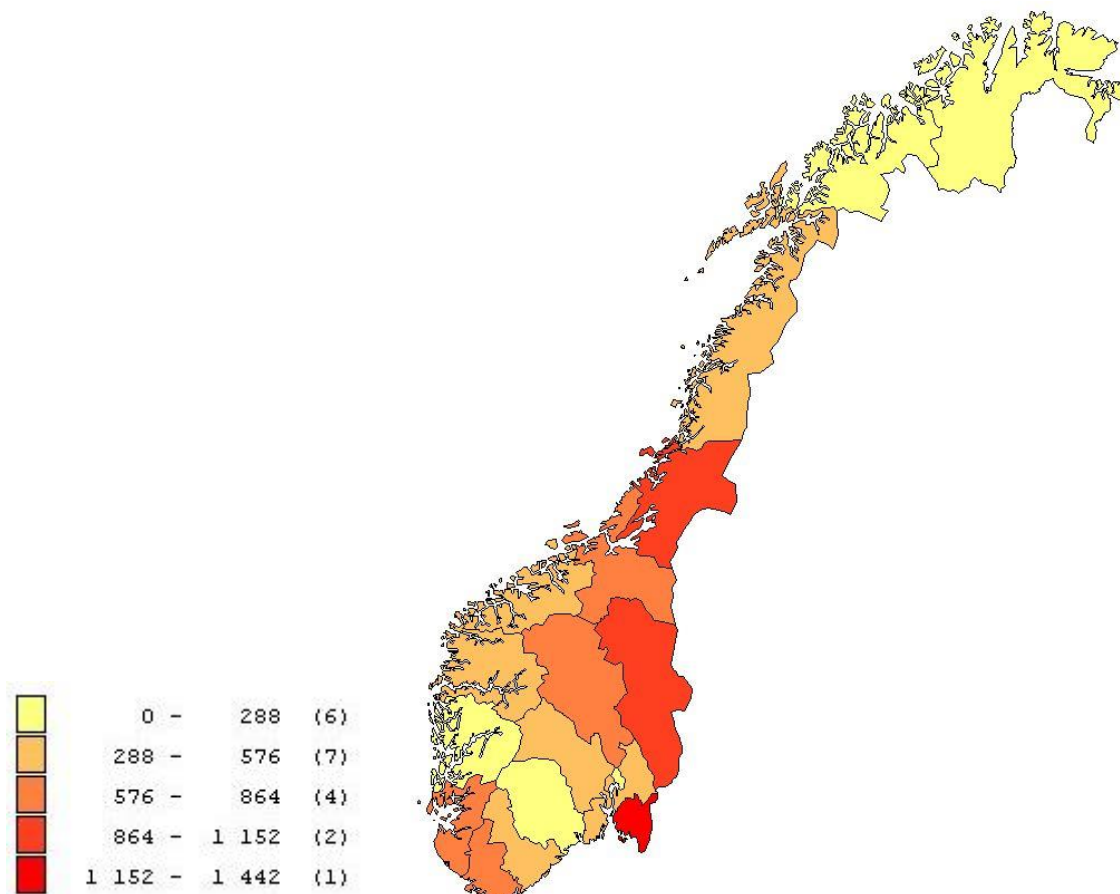


Figure 29: Value added in Wood, wood products and paper goods industry in 2014 by county. Mill NOK. Data source: SSB; Map data: Norwegian Mapping Authority

The value added in the Wood, wood products and paper goods industry is largest in Østfold, down southeast, and high in some of the counties of the middle and southern inland part of Norway.

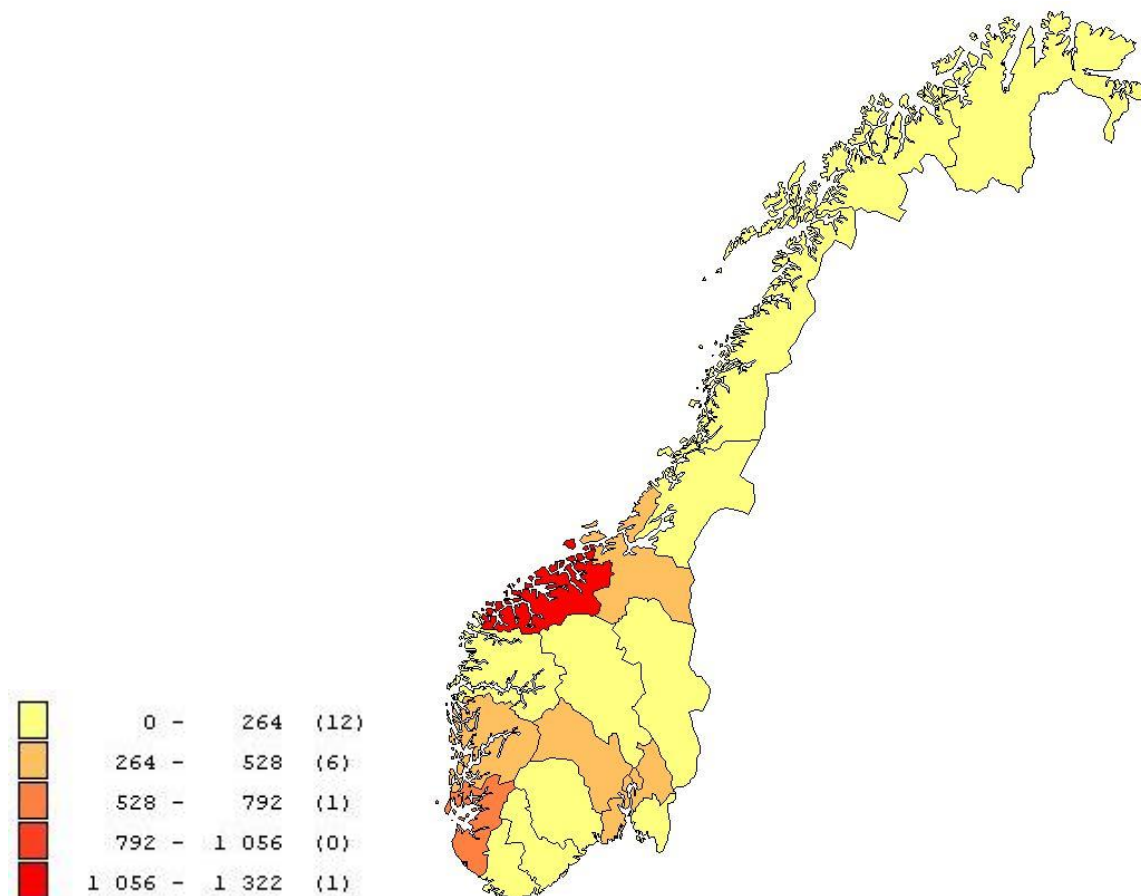


Figure 30: Value added in Furniture and other manufacturing industry in 2014 by county. Mill NOK. Data source: SSB; Map data: Norwegian Mapping Authority

Møre og Romsdal is the county with the highest value added in the Furniture and other manufacturing industry.

Conclusion

The purpose of this report has been to provide an overview of the value added in the bioeconomy in Norway, showing current status and recent trends, split on sectors and regions.

We have made a classification of bioeconomy sectors in Norway based on the standard industrial classification system of Statistics Norway, which is compatible with the system used in the EU and Eurostat. This makes comparisons across countries in Europe possible.

Our classification system includes the core bioeconomy sectors of agriculture, forestry, fisheries and aquaculture, which grow or harvest the basic biological raw materials for the bioeconomy. It also includes the industries processing these raw materials into either foodstuffs or materials for further processing, and industries doing the further processing. The classification system can further include the production of machinery, equipment and services necessary to operate and develop further the core industries and processing

bioeconomy industries. Finally, it also includes energy production, recycling, trade and services dependent of biological resources.

For the report's analysis of actual value added in the Norwegian bioeconomy we have used readily available statistics, mainly from Statistics Norway. This has limited how detailed we could analyse and present the sectors. For most part of the analysis, we considered ten bioeconomy industries/sectors at national level, and six at regional level.

The biggest bioeconomy sectors in Norway in terms of value added (in 2014) are in descending order Food products, beverages and tobacco, Agriculture, Aquaculture, Fisheries and Wood and wood products except furniture. The value added in the ten national bioeconomy sectors make up 3.6 % of Norway's total value added. This is equal to 4.7 % of the value added of "Mainland Norway" – when the large oil and gas producing sector is not included. These figures are lower bounds for the value added of the Norwegian bioeconomy. Many defined sectors of the national accounts of Statistics Norway include both bioeconomy and non-bioeconomy industries. As a detailed breakdown of the statistics for these sectors was not available figures for the bioeconomy part of these sectors could not be included here.

All of these bioeconomy industries have experienced considerable fluctuations in value added over the last four decades. However, some have had downward trends and some upwards. In particular, Aquaculture and Fisheries have grown a lot. Forestry has also grown, as has Agriculture. Textiles, wearing apparel and leather goods is the sector that has seen its value added go down the most.

Wage costs, operating surplus and subsidies as share of total value added in the industries vary a lot. In some industries, the wage costs make up over 80 % of value added, while in others less than 20 %. In the bioeconomy industries where self-employment is common, and in fisheries where fishermen get a share of the surplus rather than ordinary wages, the operating surplus can be a very large share of value added; Up to nearly 80 % in Agriculture over 2012-14. For some industries with low profitability, the surplus has been negative in the same period. Subsidies are high in Agriculture, at over 80 % of value added in 2012-14. For all other industries, it was well below 10 %. Considering the period 2008-14, wage costs, surplus and subsidies have varied considerably in all the ten bioeconomy industries.

The value added in the bioeconomy sectors in the counties of Norway also varies a lot. The value added from the six composite bioeconomy sectors considered in the report is over 11 billion NOK for the number one county and just over 1 billion for the one with the small value added. The relative importance of the value added from the bioeconomy in the counties, as share of total value added there, is between 1 and 12 %.

The relative contribution from the different bioeconomy sectors is also very different between the counties. Fishing and aquaculture is the bioeconomy sector with the largest value added in a single county, with almost 6 billion NOK in Nordland in 2014. The same sector is also big in Møre og Romsdal and Hordaland, both over 4 billion NOK. Trailing that is the Food production, beverages and tobacco sector, which had a value added between 3 and

4 billion NOK in seven counties. The value added of Agriculture and forestry reached above 2 billion NOK in two counties.

It is clear that natural conditions like landscape, soil and climate, as well as closeness to fisheries resources and a sheltered coast for aquaculture matter for the production and value added in the core bioeconomy industries. However, also other factors matter for this and not least for value added in the processing and supporting industries. This includes human resources, market conditions, logistics, research and development. Analysing how value added can be increased in the Norwegian bioeconomy industries while achieving social, ecological and economic sustainability, is a continuing task in the Biosmart project.

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Appendix

Data Tables for figures

Below are data tables used to make figures in the report, when these are not available in the main body of the report.

Table 4: National accounts 2014. Mill NOK. Source: SSB.

Industry	Value added	Wage costs	Operating surplus	Capital depreciation	Taxes	Subsidies	Revenues	Material inputs
Food and drink industry	36992	25386	5073	7253	42	762	174260	137269
Agriculture	13309	4968	10417	9335	184	11595	33254	19944
Aquaculture	12626	3446	7770	1643	39	272	43860	31234
Fisheries	9125	1394	6396	1232	452	348	14197	5071
Wood and wood products ex furniture	7468	6099	330	1240	120	321	24867	17398
Furniture and other	5722	4147	778	869	5	77	13681	7959
Forestry	4655	1074	2757	1087	12	276	7563	2909
Textiles, clothing and leather goods	2668	1693	765	375	1	165	6595	3927
Paper and pulp	2467	2011	-1310	1451	381	66	10359	7892

Table 5: Sum value added in counties from selected* bioeconomy sectors 2014 (Mill NOK), and the share of regions' total value added. Source: SSB.

	Bioeconomy sectors (Mill NOK)	Share of regions' VC
20 Finnmark - Finnmark	2924	10.5 %
19 Troms – Romsa	5323	8.5 %
18 Nordland	10 352	11.6 %
17 Nord-Trøndelag	4854	11.3 %
16 Sør-Trøndelag	7652	5.9 %
15 Møre og Romsdal	11 387	9.9 %
14 Sogn og Fjordane	4570	10.7 %
12 Hordaland	9764	4.1 %
11 Rogaland	8790	3.7 %
10 Vest-Agder	2254	3.0 %
09 Aust-Agder	1281	3.6 %
08 Telemark	1112	1.9 %
07 Vestfold	3259	4.3 %
06 Buskerud	3340	3.4 %
05 Oppland	4261	7.2 %
04 Hedmark	5986	9.6 %
03 Oslo	4343	0.9 %
02 Akershus	5170	2.2 %

01 Østfold	4890	5.7 %
Mainland Norway	101 512	4.5 %

Table 6: Value added 2014 by sector and region. Mill NOK. Source: SSB.

	Agriculture and forestry	Fishing and aquaculture	Wood, wood products and paper products	Food products, beverages and tobacco	Furniture and other manufacturing	Textiles, wearing apparel, leather	Sum all industries in region
20 Finnmark - Finnmark	121	1 778	10	998	17	-	27 872
19 Troms - Romsa	356	3 293	73	1 525	76	-	62 678
18 Nordland	988	5 693	337	3 094	135	105	89 512
17 Nord-Trøndelag	1 568	1 259	866	1 114	47	-	43 089
16 Sør-Trøndelag	1 193	1 290	651	3 930	406	182	129 890
15 Møre og Romsdal	939	4 665	307	3 744	1 322	410	115 222
14 Sogn og Fjordane	881	1 698	322	1 382	135	152	42 854
12 Hordaland	717	4 671	285	3 431	356	304	237 066
11 Rogaland	1 934	1 270	735	3 869	692	290	235 046
10 Vest-Agder	375	-	781	710	241	147	74 055
09 Aust-Agder	337	139	458	235	112	-	35 385
08 Telemark	547	28	209	211	57	60	57 651
07 Vestfold	702	-	502	1 704	304	47	76 405
06 Buskerud	1 122	-	557	1 110	416	135	99 289
05 Oppland	2 135	-	733	1 129	264	-	59 550
04 Hedmark	2 691	-	1 148	1 974	157	16	62 180
03 Oslo	27	1	64	3 813	326	112	480 750
02 Akershus	1 015	1	299	3 523	332	-	235 174
01 Østfold	1 102	35	1 442	1 851	137	323	85 747
Mainland Norway	18 750	25 821	9 779	39 347	5 532	2 283	2 250 469

Table 7: Shares of value added 2014 by sector and region. Source: SSB.

	Agriculture and forestry	Fishing and aquaculture	Wood, wood products and paper products	Food products, beverages and tobacco	Furniture and other manufacturing	Textiles, wearing apparel, leather
20 Finnmark - Finnmark	0,4 %	6,4 %	0,0 %	3,6 %	0,1 %	0,0 %
19 Troms - Romsa	0,6 %	5,3 %	0,1 %	2,4 %	0,1 %	0,0 %
18 Nordland	1,1 %	6,4 %	0,4 %	3,5 %	0,2 %	0,1 %
17 Nord-Trøndelag	3,6 %	2,9 %	2,0 %	2,6 %	0,1 %	0,0 %
16 Sør-Trøndelag	0,9 %	1,0 %	0,5 %	3,0 %	0,3 %	0,1 %
15 Møre og Romsdal	0,8 %	4,0 %	0,3 %	3,2 %	1,1 %	0,4 %
14 Sogn og Fjordane	2,1 %	4,0 %	0,8 %	3,2 %	0,3 %	0,4 %
12 Hordaland	0,3 %	2,0 %	0,1 %	1,4 %	0,2 %	0,1 %
11 Rogaland	0,8 %	0,5 %	0,3 %	1,6 %	0,3 %	0,1 %
10 Vest-Agder	0,5 %	0,0 %	1,1 %	1,0 %	0,3 %	0,2 %
09 Aust-Agder	1,0 %	0,4 %	1,3 %	0,7 %	0,3 %	0,0 %
08 Telemark	0,9 %	0,0 %	0,4 %	0,4 %	0,1 %	0,1 %
07 Vestfold	0,9 %	0,0 %	0,7 %	2,2 %	0,4 %	0,1 %
06 Buskerud	1,1 %	0,0 %	0,6 %	1,1 %	0,4 %	0,1 %
05 Oppland	3,6 %	0,0 %	1,2 %	1,9 %	0,4 %	0,0 %
04 Hedmark	4,3 %	0,0 %	1,8 %	3,2 %	0,3 %	0,0 %
03 Oslo	0,0 %	0,0 %	0,0 %	0,8 %	0,1 %	0,0 %
02 Akershus	0,4 %	0,0 %	0,1 %	1,5 %	0,1 %	0,0 %
01 Østfold	1,3 %	0,0 %	1,7 %	2,2 %	0,2 %	0,4 %
Mainland Norway	0,8 %	1,1 %	0,4 %	1,7 %	0,2 %	0,1 %

Tables of bioeconomy classification by NACE codes

Below is a table with all the NACE codes we have defined as part of the core and mixed bioeconomy. It is also possible to get an excel file with the classification by contacting the author. That file also has segmentation of NACE codes into different bioeconomy industries.

Table 8: NACE code and industries defined as part of the bioeconomy. Source: Norut.

NACE	Industry name (Norwegian)
A	Jordbruk, skogbruk og fiske
01	Jordbruk og tjenester tilknyttet jordbruk, jakt og viltstell
01.1	Dyrking av ettårige vekster
01.11	Dyrking av korn (unntatt ris), belgvekster og oljeholdige vekster
01.110	Dyrking av korn (unntatt ris), belgvekster og oljeholdige vekster
01.12	Dyrking av ris
01.120	Dyrking av ris
01.13	Dyrking av grønnsaker, meloner, rot- og knollvekster

01.130	Dyrking av grønnsaker, meloner, rot- og knollvekster
01.14	Dyrking av sukkerrør
01.140	Dyrking av sukkerrør
01.15	Dyrking av tobakk
01.150	Dyrking av tobakk
01.16	Dyrking av fibervekster
01.160	Dyrking av fibervekster
01.19	Dyrking av ettårige vekster ellers
01.190	Dyrking av ettårige vekster ellers
01.2	Dyrking av flerårige vekster
01.21	Dyrking av druer
01.210	Dyrking av druer
01.22	Dyrking av tropiske og subtropiske frukter
01.220	Dyrking av tropiske og subtropiske frukter
01.23	Dyrking av sitrusfrukter
01.230	Dyrking av sitrusfrukter
01.24	Dyrking av kjernefrukter og steinfrukter
01.240	Dyrking av kjernefrukter og steinfrukter
01.25	Dyrking av annen frukt som vokser på trær eller busker samt nøtter
01.250	Dyrking av annen frukt som vokser på trær eller busker samt nøtter
01.26	Dyrking av oljeholdige frukter
01.260	Dyrking av oljeholdige frukter
01.27	Dyrking av vekster for produksjon av drikkevarer
01.270	Dyrking av vekster for produksjon av drikkevarer
01.28	Dyrking av krydder og aromatiske, medisinske og farmasøytiske vekster
01.280	Dyrking av krydder og aromatiske, medisinske og farmasøytiske vekster
01.29	Dyrking av flerårige vekster ellers
01.290	Dyrking av flerårige vekster ellers
01.3	Planteformering
01.30	Planteformering
01.300	Planteformering
01.4	Husdyrhold
01.41	Melkeproduksjon på storfe
01.410	Melkeproduksjon på storfe
01.42	Oppdrett av annet storfe
01.420	Oppdrett av annet storfe
01.43	Oppdrett av hester og andre dyr av hestefamilien
01.430	Oppdrett av hester og andre dyr av hestefamilien
01.44	Oppdrett av kameler og andre kameldyr
01.440	Oppdrett av kameler og andre kameldyr
01.45	Saue- og geitehold
01.451	Sauehold
01.452	Geitehold
01.46	Svinehold
01.460	Svinehold

01.47	Fjørfehold
01.471	Hold av verpehøner for konsumeggproduksjon
01.479	Annet fjørfehold
01.49	Husdyrhold ellers
01.490	Husdyrhold ellers
01.5	Kombinert husdyrhold og planteproduksjon
01.50	Kombinert husdyrhold og planteproduksjon
01.500	Kombinert husdyrhold og planteproduksjon
01.6	Tjenester tilknyttet jordbruk og etterbehandling av vekster etter innhøsting
01.61	Tjenester tilknyttet planteproduksjon
01.610	Tjenester tilknyttet planteproduksjon
01.62	Tjenester tilknyttet husdyrhold
01.620	Tjenester tilknyttet husdyrhold
01.63	Etterbehandling av vekster etter innhøsting
01.630	Etterbehandling av vekster etter innhøsting
01.64	Behandling av såfrø
01.640	Behandling av såfrø
01.7	Jakt, viltstell og tjenester tilknyttet jakt og viltstell
01.70	Jakt, viltstell og tjenester tilknyttet jakt og viltstell
01.700	Jakt, viltstell og tjenester tilknyttet jakt og viltstell
02	Skogbruk og tjenester tilknyttet skogbruk
02.1	Skogskjøtsel og andre skogbruksaktiviteter
02.10	Skogskjøtsel og andre skogbruksaktiviteter
02.100	Skogskjøtsel og andre skogbruksaktiviteter
02.2	Avvirkning
02.20	Avvirkning
02.200	Avvirkning
02.3	Innsamling av viltvoksende produkter av annet enn tre
02.30	Innsamling av viltvoksende produkter av annet enn tre
02.300	Innsamling av viltvoksende produkter av annet enn tre
02.4	Tjenester tilknyttet skogbruk
02.40	Tjenester tilknyttet skogbruk
02.400	Tjenester tilknyttet skogbruk
03	Fiske, fangst og akvakultur
03.1	Fiske og fangst
03.11	Hav- og kystfiske og fangst
03.111	Hav- og kystfiske
03.112	Hvalfangst
03.12	Ferskvannsfiske
03.120	Ferskvannsfiske
03.2	Akvakultur
03.21	Hav- og kystbasert akvakultur
03.211	Produksjon av matfisk, bløtdyr, krepsdyr og pigghuder i hav- og kystbasert akvakultur
03.212	Produksjon av yngel og settefisk i hav- og kystbasert akvakultur
03.213	Tjenester tilknyttet hav- og kystbasert akvakultur

03.22	Ferskvannsbasert akvakultur
03.221	Produksjon av matfisk, bløtdyr og krepsdyr i ferskvannsbasert akvakultur
03.222	Produksjon av yngel og settefisk i ferskvannsbasert akvakultur
03.223	Tjenester tilknyttet ferskvannsbasert akvakultur
10	Produksjon av nærings- og nytelsesmidler
10.1	Produksjon, bearbeiding og konservering av kjøtt og kjøttvarer
10.11	Bearbeiding og konservering av kjøtt
10.110	Bearbeiding og konservering av kjøtt
10.12	Bearbeiding og konservering av fjørfekjøtt
10.120	Bearbeiding og konservering av fjørfekjøtt
10.13	Produksjon av kjøtt- og fjørfevarer
10.130	Produksjon av kjøtt- og fjørfevarer
10.2	Bearbeiding og konservering av fisk, skalldyr og bløtdyr
10.20	Bearbeiding og konservering av fisk, skalldyr og bløtdyr
10.201	Produksjon av saltfisk, tørrfisk og klippfisk
10.202	Frysing av fisk, fiskefileter, skalldyr og bløtdyr
10.203	Produksjon av fiskehermetikk
10.209	Slakting, bearbeiding og konservering av fisk og fiskevarer ellers
10.3	Bearbeiding og konservering av frukt og grønnsaker
10.31	Bearbeiding og konservering av poteter
10.310	Bearbeiding og konservering av poteter
10.32	Produksjon av juice av frukt og grønnsaker
10.320	Produksjon av juice av frukt og grønnsaker
10.39	Bearbeiding og konservering av frukt og grønnsaker ellers
10.390	Bearbeiding og konservering av frukt og grønnsaker ellers
10.4	Produksjon av vegetabiliske og animalske oljer og fettstoffer
10.41	Produksjon av oljer og fettstoffer
10.411	Produksjon av rå fiskeoljer og fett
10.412	Produksjon av andre uraffinerte oljer og fett
10.413	Produksjon av raffinerte oljer og fett
10.42	Produksjon av margarin og lignende spiselige fettstoffer
10.420	Produksjon av margarin og lignende spiselige fettstoffer
10.5	Produksjon av meierivarer og iskrem
10.51	Produksjon av meierivarer
10.510	Produksjon av meierivarer
10.52	Produksjon av iskrem
10.520	Produksjon av iskrem
10.6	Produksjon av kornvarer, stivelse og stivelsesprodukter
10.61	Produksjon av kornvarer
10.610	Produksjon av kornvarer
10.62	Produksjon av stivelse og stivelsesprodukter
10.620	Produksjon av stivelse og stivelsesprodukter
10.7	Produksjon av bakeri- og pastavarer
10.71	Produksjon av brød og ferske konditorvarer
10.710	Produksjon av brød og ferske konditorvarer

10.72	Produksjon av kavringer, kjeks og konserverte konditorvarer
10.720	Produksjon av kavringer, kjeks og konserverte konditorvarer
10.73	Produksjon av makaroni, nudler, couscous og lignende pastavarer
10.730	Produksjon av makaroni, nudler, couscous og lignende pastavarer
10.8	Produksjon av andre næringsmidler
10.81	Produksjon av sukker
10.810	Produksjon av sukker
10.82	Produksjon av kakao, sjokolade og sukkervarer
10.820	Produksjon av kakao, sjokolade og sukkervarer
10.83	Bearbeiding av te og kaffe
10.830	Bearbeiding av te og kaffe
10.84	Produksjon av smakstilsetningsstoffer og krydderier
10.840	Produksjon av smakstilsetningsstoffer og krydderier
10.85	Produksjon av ferdigmat
10.850	Produksjon av ferdigmat
10.86	Produksjon av homogeniserte matprodukter og diettmat
10.860	Produksjon av homogeniserte matprodukter og diettmat
10.89	Produksjon av næringsmidler ikke nevnt annet sted
10.890	Produksjon av næringsmidler ikke nevnt annet sted
10.9	Produksjon av fôrvarer
10.91	Produksjon av fôrvarer til husdyrhold
10.910	Produksjon av fôrvarer til husdyrhold
10.92	Produksjon av fôrvarer til kjæledyr
10.920	Produksjon av fôrvarer til kjæledyr
11	Produksjon av drikkevarer
11.0	Produksjon av drikkevarer
11.01	Destillering, rektifisering og blanding av sprit
11.010	Destillering, rektifisering og blanding av sprit
11.02	Produksjon av vin
11.020	Produksjon av vin
11.03	Produksjon av sider og annen fruktvin
11.030	Produksjon av sider og annen fruktvin
11.04	Produksjon av andre ikke-destillerte gjærede drikkevarer
11.040	Produksjon av andre ikke-destillerte gjærede drikkevarer
11.05	Produksjon av øl
11.050	Produksjon av øl
11.06	Produksjon av malt
11.060	Produksjon av malt
11.07	Produksjon av mineralvann, leskedrikker og annet vann på flaske
11.070	Produksjon av mineralvann, leskedrikker og annet vann på flaske
12	Produksjon av tobakksvarer
12.0	Produksjon av tobakksvarer
12.00	Produksjon av tobakksvarer
12.000	Produksjon av tobakksvarer
13	Produksjon av tekstiler

13.1	Bearbeiding og spinning av tekstilfibrer
13.10	Bearbeiding og spinning av tekstilfibrer
13.100	Bearbeiding og spinning av tekstilfibrer
13.2	Veving av tekstiler
13.20	Veving av tekstiler
13.200	Veving av tekstiler
13.3	Etterbehandling av tekstiler
13.30	Etterbehandling av tekstiler
13.300	Etterbehandling av tekstiler
13.9	Produksjon av andre tekstiler
13.91	Produksjon av stoffer av trikotasje
13.910	Produksjon av stoffer av trikotasje
13.92	Produksjon av tekstilvarer, unntatt klær
13.921	Produksjon av utstyrsvarer
13.929	Produksjon av andre tekstilvarer, unntatt klær
13.93	Produksjon av gulvtepper, -matter og -ryer
13.930	Produksjon av gulvtepper, -matter og -ryer
13.94	Produksjon av tauverk og nett
13.940	Produksjon av tauverk og nett
13.95	Produksjon av ikke-vevde tekstiler og tekstilvarer, unntatt klær
13.950	Produksjon av ikke-vevde tekstiler og tekstilvarer, unntatt klær
13.96	Produksjon av tekstiler til teknisk og industriell bruk
13.960	Produksjon av tekstiler til teknisk og industriell bruk
13.99	Produksjon av tekstiler ikke nevnt annet sted
13.990	Produksjon av tekstiler ikke nevnt annet sted
14	Produksjon av klær
14.1	Produksjon av klær, unntatt pelsvarer
14.11	Produksjon av klær av lær
14.110	Produksjon av klær av lær
14.12	Produksjon av arbeidstøy
14.120	Produksjon av arbeidstøy
14.13	Produksjon av annet yttertøy
14.130	Produksjon av annet yttertøy
14.14	Produksjon av undertøy og innertøy
14.140	Produksjon av undertøy og innertøy
14.19	Produksjon av klær og tilbehør ellers
14.190	Produksjon av klær og tilbehør ellers
14.2	Produksjon av pelsvarer
14.20	Produksjon av pelsvarer
14.200	Produksjon av pelsvarer
14.3	Produksjon av klær av trikotasje
14.31	Produksjon av strømpevarer
14.310	Produksjon av strømpevarer
14.39	Produksjon av andre klær av trikotasje
14.390	Produksjon av andre klær av trikotasje

15	Produksjon av lær og lærvarer
15.1	Beredning av lær, produksjon av reiseeffekter og salmakerartikler og beredning og farging av pelsskinn
15.11	Beredning av lær, og beredning og farging av pelsskinn
15.110	Beredning av lær, og beredning og farging av pelsskinn
15.12	Produksjon av reiseeffekter og salmakerartikler
15.120	Produksjon av reiseeffekter og salmakerartikler
15.2	Produksjon av skotøy
15.20	Produksjon av skotøy
15.200	Produksjon av skotøy
16	Produksjon av trelast og varer av tre, kork, strå og flettematerialer, unntatt møbler
16.1	Saging, høvling og impregnering av tre
16.10	Saging, høvling og impregnering av tre
16.100	Saging, høvling og impregnering av tre
16.2	Produksjon av varer av tre, kork, strå og flettematerialer
16.21	Produksjon av finerplater og andre bygnings- og møbelplater av tre
16.210	Produksjon av finerplater og andre bygnings- og møbelplater av tre
16.22	Produksjon av sammensatte parkettstaver
16.220	Produksjon av sammensatte parkettstaver
16.23	Produksjon av andre bygningsartikler
16.231	Produksjon av monteringsferdige hus
16.232	Produksjon av bygningsartikler
16.24	Produksjon av treemballasje
16.240	Produksjon av treemballasje
16.29	Produksjon av andre trevarer og varer av kork, strå og flettematerialer
16.290	Produksjon av andre trevarer og varer av kork, strå og flettematerialer
17	Produksjon av papir og papirvarer
17.1	Produksjon av papirmasse, papir og papp
17.11	Produksjon av papirmasse
17.110	Produksjon av papirmasse
17.12	Produksjon av papir og papp
17.120	Produksjon av papir og papp
17.2	Produksjon av varer av papir og papp
17.21	Produksjon av bølgepapp og emballasje av papir og papp
17.210	Produksjon av bølgepapp og emballasje av papir og papp
17.22	Produksjon av husholdnings-, sanitær- og toalettartikler av papir
17.220	Produksjon av husholdnings-, sanitær- og toalettartikler av papir
17.23	Produksjon av kontorartikler av papir
17.230	Produksjon av kontorartikler av papir
17.24	Produksjon av tapeter
17.240	Produksjon av tapeter
17.29	Produksjon av varer av papir og papp ellers
17.290	Produksjon av varer av papir og papp ellers
20	Produksjon av kjemikalier og kjemiske produkter
20.1	Produksjon av kjemiske råvarer, gjødsel og nitrogenforbindelser, basisplast og

	syntetisk gummi
20.11	Produksjon av industrigasser
20.110	Produksjon av industrigasser
20.12	Produksjon av fargestoffer og pigmenter
20.120	Produksjon av fargestoffer og pigmenter
20.14	Produksjon av andre organiske kjemiske råvarer
20.140	Produksjon av andre organiske kjemiske råvarer
20.15	Produksjon av gjødsel, nitrogenforbindelser og vekstjord
20.150	Produksjon av gjødsel, nitrogenforbindelser og vekstjord
20.2	Produksjon av plantevern- og skadedyrmidler og andre landbrukskjemiske produkter
20.20	Produksjon av plantevern- og skadedyrmidler og andre landbrukskjemiske produkter
20.200	Produksjon av plantevern- og skadedyrmidler og andre landbrukskjemiske produkter
20.52	Produksjon av lim
20.520	Produksjon av lim
20.59	Produksjon av kjemiske produkter ikke nevnt annet sted
21	Produksjon av farmasøytiske råvarer og preparater
21.1	Produksjon av farmasøytiske råvarer
21.10	Produksjon av farmasøytiske råvarer
21.100	Produksjon av farmasøytiske råvarer
21.2	Produksjon av farmasøytiske preparater
21.20	Produksjon av farmasøytiske preparater
21.200	Produksjon av farmasøytiske preparater
28.3	Produksjon av jordbruks- og skogbruksmaskiner
28.30	Produksjon av jordbruks- og skogbruksmaskiner
28.300	Produksjon av jordbruks- og skogbruksmaskiner
28.93	Produksjon av maskiner og utstyr til nærings- og nytelsesmiddelindustri
28.930	Produksjon av maskiner og utstyr til nærings- og nytelsesmiddelindustri
28.94	Produksjon av maskiner og utstyr til tekstil-, konfeksjons- og lærvareindustri
28.940	Produksjon av maskiner og utstyr til tekstil-, konfeksjons- og lærvareindustri
28.95	Produksjon av maskiner og utstyr til papir- og pappvareindustri
28.950	Produksjon av maskiner og utstyr til papir- og pappvareindustri
30.11	Bygging av skip og flytende materiell
30.111	Bygging av skip og skrog over 100 br.tonn
30.112	Bygging av skip under 100 br.tonn
30.114	Produksjon av annet flytende materiell
30.115	Innrednings- og installasjonsarbeid utført på skip over 100 br.tonn
31	Produksjon av møbler
31.0	Produksjon av møbler
31.01	Produksjon av kontor- og butikk møbler
31.010	Produksjon av kontor- og butikk møbler
31.02	Produksjon av kjøkkenmøbler
31.020	Produksjon av kjøkkenmøbler
31.09	Produksjon av møbler ellers
31.090	Produksjon av møbler ellers
33.15	Reparasjon og vedlikehold av skip og båter

33.150	Reparasjon og vedlikehold av skip og båter
35.113	Produksjon av elektrisitet fra biobrensel
35.114	Produksjon av elektrisitet fra naturgass
35.2	Produksjon av gass og distribusjon av gass gjennom ledningsnett
35.21	Produksjon av gass
35.210	Produksjon av gass
35.3	Damp- og varmtvannsforsyning
35.30	Damp- og varmtvannsforsyning
35.300	Damp- og varmtvannsforsyning
38	Innsamling, behandling, disponering og gjenvinning av avfall
38.1	Innsamling av avfall
38.11	Innsamling av ikke-farlig avfall
38.110	Innsamling av ikke-farlig avfall
38.21	Behandling og disponering av ikke-farlig avfall
38.210	Behandling og disponering av ikke-farlig avfall
38.3	Materialgjenvinning
38.32	Sortering og bearbeiding av avfall for materialgjenvinning
38.320	Sortering og bearbeiding av avfall for materialgjenvinning
46.2	Engroshandel med jordbruksråvarer og levende dyr
46.21	Engroshandel med korn, råttobakk, såvarer og fôrvarer
46.210	Engroshandel med korn, råttobakk, såvarer og fôrvarer
46.22	Engroshandel med blomster og planter
46.220	Engroshandel med blomster og planter
46.23	Engroshandel med levende dyr
46.230	Engroshandel med levende dyr
46.24	Engroshandel med huder, skinn og lær
46.240	Engroshandel med huder, skinn og lær
46.3	Engroshandel med nærings- og nytelsesmidler
46.31	Engroshandel med frukt og grønnsaker
46.310	Engroshandel med frukt og grønnsaker
46.32	Engroshandel med kjøtt og kjøttvarer
46.320	Engroshandel med kjøtt og kjøttvarer
46.33	Engroshandel med meierivarer, egg, matolje og -fett
46.330	Engroshandel med meierivarer, egg, matolje og -fett
46.34	Engroshandel med drikkevarer
46.341	Engroshandel med vin og brennevin
46.349	Engroshandel med drikkevarer ellers
46.35	Engroshandel med tobakksvarer
46.350	Engroshandel med tobakksvarer
46.36	Engroshandel med sukker, sjokolade og sukkervarer
46.360	Engroshandel med sukker, sjokolade og sukkervarer
46.37	Engroshandel med kaffe, te, kakao og krydder
46.370	Engroshandel med kaffe, te, kakao og krydder
46.38	Engroshandel med andre næringsmidler, herunder fisk, skalldyr og bløtdyr
46.381	Engroshandel med fisk, skalldyr og bløtdyr

46.389	Engroshandel med spesialisert utvalg av nærings- og nytelsesmidler ikke nevnt annet sted
46.39	Engroshandel med bredt utvalg av nærings- og nytelsesmidler
46.390	Engroshandel med bredt utvalg av nærings- og nytelsesmidler
46.41	Engroshandel med tekstiler og utstyrsvarer
46.410	Engroshandel med tekstiler og utstyrsvarer
46.42	Engroshandel med klær og skotøy
46.421	Engroshandel med klær
46.422	Engroshandel med skotøy
46.471	Engroshandel med møbler
46.491	Engroshandel med bøker, aviser og blader
46.492	Engroshandel med reiseeffekter og lærvarer
46.61	Engroshandel med maskiner og utstyr til jordbruk og skogbruk
46.610	Engroshandel med maskiner og utstyr til jordbruk og skogbruk
46.64	Engroshandel med maskiner og utstyr til tekstilproduksjon
46.640	Engroshandel med maskiner og utstyr til tekstilproduksjon
46.65	Engroshandel med kontormøbler
46.650	Engroshandel med kontormøbler
46.692	Engroshandel med skipsutstyr og fiskeredskap
46.73	Engroshandel med tømmer, trelast, byggevarer og sanitærutstyr
46.731	Engroshandel med tømmer
46.732	Engroshandel med trelast
46.739	Engroshandel med byggevarer ikke nevnt annet sted
46.761	Engroshandel med papir og papp
47.11	Butikkhandel med bredt vareutvalg med hovedvekt på nærings- og nytelsesmidler
47.111	Butikkhandel med bredt vareutvalg med hovedvekt på nærings- og nytelsesmidler
47.112	Kioskhandel med bredt vareutvalg med hovedvekt på nærings- og nytelsesmidler
47.2	Butikkhandel med nærings- og nytelsesmidler i spesialforretninger
47.21	Butikkhandel med frukt og grønnsaker
47.210	Butikkhandel med frukt og grønnsaker
47.22	Butikkhandel med kjøtt og kjøttvarer
47.220	Butikkhandel med kjøtt og kjøttvarer
47.23	Butikkhandel med fisk, skalldyr og bløtdyr
47.230	Butikkhandel med fisk, skalldyr og bløtdyr
47.24	Butikkhandel med bakervarer, konditorvarer og sukkervarer
47.241	Butikkhandel med bakervarer og konditorvarer
47.242	Butikkhandel med sukkervarer
47.25	Butikkhandel med drikkevarer
47.251	Butikkhandel med vin og brennevin
47.259	Butikkhandel med drikkevarer ellers
47.26	Butikkhandel med tobakksvarer
47.260	Butikkhandel med tobakksvarer
47.29	Butikkhandel med nærings- og nytelsesmidler ellers
47.291	Butikkhandel med helsekost
47.292	Butikkhandel med kaffe og te

47.299	Butikkhandel med nærings- og nytelsesmidler ikke nevnt annet sted
47.51	Butikkhandel med tekstiler og utstyrsvare
47.510	Butikkhandel med tekstiler og utstyrsvare
47.524	Butikkhandel med trelast
47.529	Butikkhandel med byggevarer ikke nevnt annet sted
47.53	Butikkhandel med tapeter, gulvtepper og gardiner
47.531	Butikkhandel med tapeter og gulvbelegg
47.532	Butikkhandel med tepper
47.533	Butikkhandel med gardiner
47.591	Butikkhandel med møbler
47.61	Butikkhandel med bøker
47.610	Butikkhandel med bøker
47.62	Butikkhandel med aviser og papirvarer
47.620	Butikkhandel med aviser og papirvarer
47.71	Butikkhandel med klær
47.710	Butikkhandel med klær
47.72	Butikkhandel med skotøy og lærvarer
47.721	Butikkhandel med skotøy
47.722	Butikkhandel med reiseeffekter av lær og lærimitasjoner og varer av lær
47.73	Butikkhandel med apotekvarer
47.730	Butikkhandel med apotekvarer
47.76	Butikkhandel med blomster og planter, kjæledyr og fôrvarer til kjæledyr
47.761	Butikkhandel med blomster og planter
47.762	Butikkhandel med kjæledyr og fôrvarer til kjæledyr
47.81	Torghandel med næringsmidler, drikkevarer og tobakksvarer
47.810	Torghandel med næringsmidler, drikkevarer og tobakksvarer
47.82	Torghandel med tekstiler, klær, skotøy og utstyrsvare
47.820	Torghandel med tekstiler, klær, skotøy og utstyrsvare
47.912	Postordre-/Internetthandel med tekstiler, utstyrsvare, klær, skotøy, reiseeffekter og lærvarer
47.913	Postordre-/Internetthandel med belysningsutstyr, kjøkkenutstyr, møbler og innredningsartikler
47.915	Postordre-/internetthandel med bøker, papir, aviser og blader
47.917	Postordre-/Internetthandel med helsekost
56	Serveringsvirksomhet
56.1	Restaurantvirksomhet
56.10	Restaurantvirksomhet
56.101	Drift av restauranter og kafeer
56.102	Drift av gatekjøkken
56.2	Cateringvirksomhet og kantiner drevet som selvstendig virksomhet
56.21	Cateringvirksomhet
56.210	Cateringvirksomhet
56.29	Kantiner drevet som selvstendig virksomhet
56.290	Kantiner drevet som selvstendig virksomhet
56.3	Drift av barer

56.30	Drift av barer
56.301	Drift av puber
56.309	Drift av barer ellers
58	Forlagsvirksomhet
58.1	Utgivelse av bøker, tidsskrifter og annen forlagsvirksomhet
58.11	Utgivelse av bøker
58.110	Utgivelse av bøker
58.12	Utgivelse av kataloger og adresselister
58.120	Utgivelse av kataloger og adresselister
58.13	Utgivelse av aviser
58.130	Utgivelse av aviser
58.14	Utgivelse av blader og tidsskrifter
58.140	Utgivelse av blader og tidsskrifter
58.19	Forlagsvirksomhet ellers
58.190	Forlagsvirksomhet ellers
72.11	Forskning og utviklingsarbeid innen bioteknologi
72.110	Forskning og utviklingsarbeid innen bioteknologi
75	Veterinærtjenester
75.0	Veterinærtjenester
75.00	Veterinærtjenester
75.000	Veterinærtjenester