



**NORWEGIAN
DATACENTER**
INDUSTRY

The Data Center Industry in Norway 2023-2024



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1: Introduction

From Myths to Facts

The data center industry is experiencing strong growth, both globally and in Norway. Growth is driven by digitalisation and the development of artificial intelligence.

Norway and the Nordic countries are well positioned when large global players consider locations for the processing and storage of their data. A cool climate reduces the use of energy for cooling. The energy used is renewable, in contrast to countries such as Germany and the UK where the CO₂ intensity per kWh (gCO₂eq/kWh) is up to twelve times as high, according to Electricity Maps.

The data center industry is power-intensive. This places a heavy responsibility on the players in the industry to ensure that energy is efficiently utilised, and that the residual energy is reused. In recent years, the industry has experienced that both global and local Norwegian customers are demanding sustainable operations. Almost 40 per cent of managers in Norwegian businesses consider sustainability and the circular economy as important or very important when choosing a data processing and storage solution. There are many indications that this proportion will increase rapidly.

Planned establishments of data centers have attracted a lot of attention in recent years. Heated debates have been characterised by myths, rumours, speculations and allegations. Horror scenarios have been presented, saying that data centers soon will demand "50 per cent of Norway's total energy production".

This report documents that the data center industry in Norway today has a maximum installed capacity of 501 MW and that approximately 150 MW of this capacity is currently being utilised. This corresponds to around one per cent of Norway's power production. Because the industry is growing rapidly, capacity utilisation will increase in the coming years.

The Norwegian Water Resources and Energy Directorate (NVE) forecast that data centers will use five per cent of Norway's power production in 2050 seems to hold true, even when the potential establishment of data centers for large international IT giants is included. In comparison, NVE estimates that the traditional power-intensive industry will utilise 30 per cent of Norwegian national energy production in 2050.

The purpose of this report is to document the facts about the data center industry to ensure that future debates are based on correct information. We will publish a more comprehensive report in spring 2024 and plan annual releases. All questions, comments and suggestions for improvements are welcome.

Enjoy the reading!

Oslo, 18 January, 2024

Gisle M. Eckhoff
Chairman

Bjørn Rønning
Managing Director

2: Summary

Norwegian business leaders are positive towards the data center industry

A survey conducted by Sentio for the Norwegian Data Center Industry in October 2023 shows that 31 per cent of Norwegian business leaders are either positive or very positive towards the data center industry in Norway. Only 1 per cent answer that they are very negative.

Sustainability and circular economy count when choosing a data center partner

The survey shows that 38 per cent of business leaders think sustainability and the circular economy are important or very important when choosing a data processing and storage solution. 31 per cent find this less important or not important at all.

The data center industry is growing in Norway and internationally

The world's data center industry is expected to have annual revenue growth of around 10 per cent until 2030. The growth is driven by digitalisation and especially artificial intelligence (AI) and High Performance Computing (HPC). The data center industry in Norway had an installed capacity of 501 MW as per December 2023. Around 150 MW of this capacity is currently being utilised, corresponding to around one per cent of Norway's power production.

It is a myth that data centers contribute less value to society than other industries

Data centers contribute with value creation twice as high as traditional power-intensive industry measured against energy consumption according to Menon Economics. In contrast to traditional industry, the data center industry in Norway does not receive any subsidies such as reduced electricity tax or CO2 compensation. The data center industry in Norway employed 646 full-time employees as per December 2023, including hired full-time personnel. A total of 1,688 employees at 810 subcontractors were engaged full-time for the data center industry in 2023. This means that over 2,300 people worked full-time for the data center industry in Norway in 2023.

Cryptocurrency mining is not serious data center business

Cryptocurrency mining has received a lot of media attention in recent years. Unfortunately, players who mine cryptocurrency have been wrongly described as part of the professional Norwegian data center industry.

Regulation of the data center industry was strengthened in 2023

A proposal for a new Electronic Communications Act (ekomloven) was presented and will open for regulation of the data center industry. Work is now underway on regulations which will ensure that the industry is thoroughly overseen, which will ensure quality for data center customers.

The data center industry uses around 1 per cent of Norway's power production

NVE's forecast for Norway's short-term power balance shows that the data center industry uses around 1 per cent of Norway's power production in 2023 and that this may increase to 1.9 per cent in 2028. In comparison, the traditional power-intensive industry uses around 27 per cent of Norway's power production today, with a slight reduction to 25 per cent in 2028, according to the forecast.

3: Knowledge about the industry among business leaders

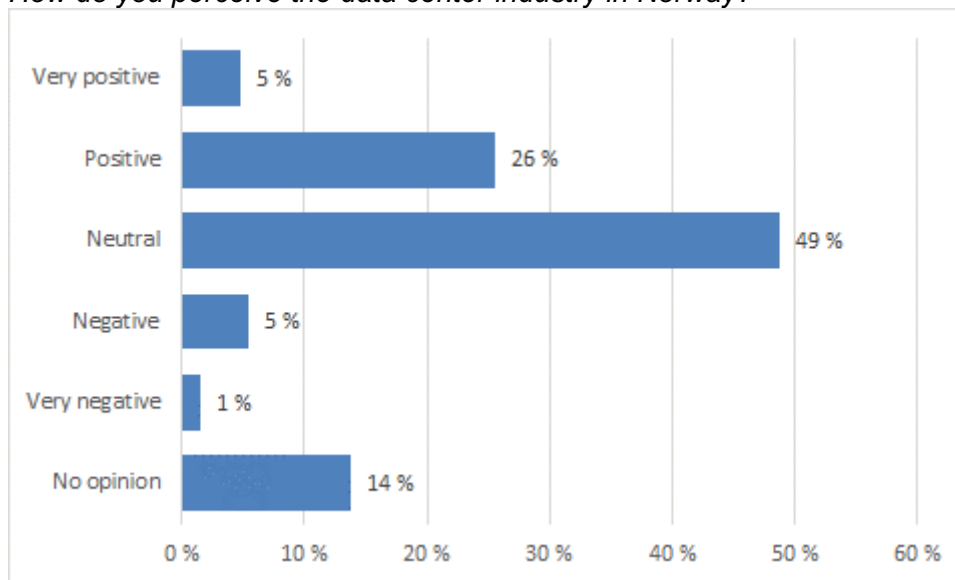
Business leaders positive towards data centers

Norwegian business leaders generally have a good impression of the Norwegian data center industry. Only 6 per cent are skeptical.

This is one of the conclusions of a survey Sentio carried out for the Norwegian Data Center Industry in October 2023. Telephone interviews were conducted with a randomly drawn sample of 601 business leaders in Norway. The interviews were conducted from 6 to 20 October 2023.

The survey shows that 31 per cent of the respondents are either positive or very positive towards the data center industry in Norway. Only 1 per cent had a very negative perception.

How do you perceive the data center industry in Norway?



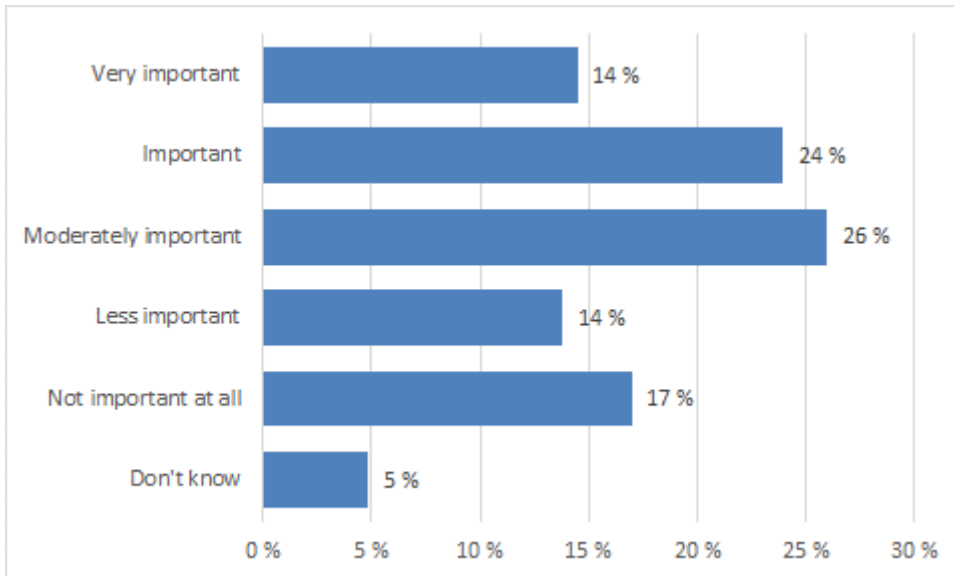
Source: Sentio/Norwegian Data Center Industry

For the data center industry, these are encouraging figures. The findings show that, in general, Norwegian leaders have a good impression of the industry, despite the high level of attention and heated debate surrounding energy needs and new establishments.

In the survey, Norwegian business leaders were also asked how important factors such as sustainability and the circular economy are when choosing a data processing and storage solution. The survey shows that 38 per cent think this is important or very important, while 31 per cent find this less important or not important at all.

The members of the Norwegian Data Center Industry, which make up the largest and leading players in the industry, experience that both Norwegian and international customers place strict demands on sustainable solutions when choosing a data center partner. The results of the survey underpin this development.

How important are sustainability and circular economy for your company when choosing a data processing and storage solution?

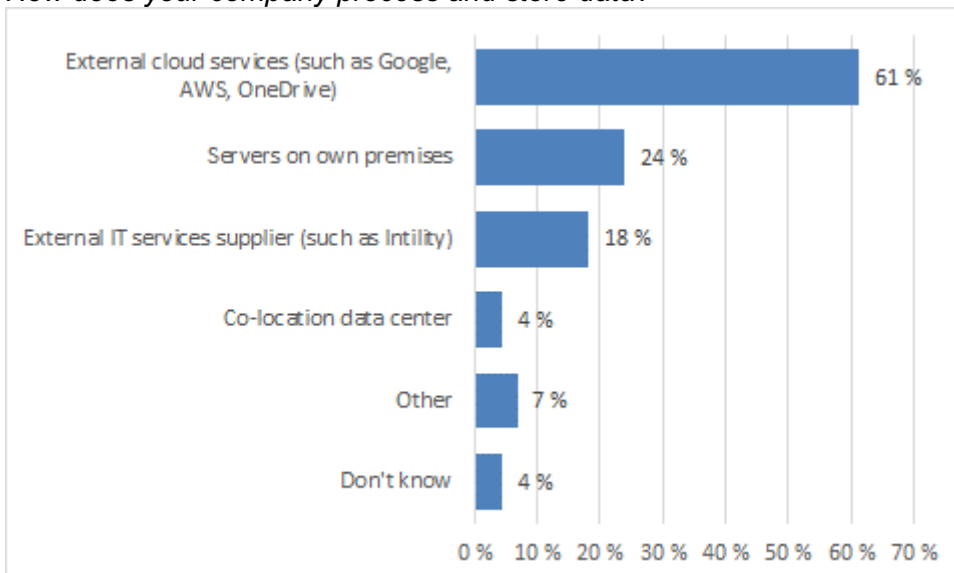


Source: Sentio/Norwegian Data Center Industry

The figures from the survey show that it is among the managers in the transport and storage industry that sustainability is most important, while in the construction and professional services sectors we find those who consider it less important.

The business leaders were also asked how their business processes and stores data. The answers document a high awareness of data storage and processing, with only four per cent answering "don't know". The answers also show that the use of cloud services is widespread, not surprisingly, and that 20 per cent use hybrid solutions, where several of the options are combined.

How does your company process and store data?



Source: Sentio/Norwegian Data Center Industry

4: The data center industry in Norway

A growth industry

The world's data center industry is expected to have annual revenue growth of around 10 per cent until 2030 (1). Norway has competitive advantages such as renewable energy, a cold climate and political stability. Growth in Norway is expected at the same level, given that the framework conditions for the establishment of data centers do not deteriorate.

In 2023, large investments have been made in the development of new data centers both in connection with existing facilities and in new areas.

Estimated investments in the Norwegian data center industry in the coming years are NOK 20-30 billion per year. The level of investment indicates strong future income growth. It normally takes one to two years before such investments materialise in increased income.

Growth is driven by increased digitalisation, AI and HPC

It is the digitalisation of society that drives growth in the data center industry. Whether it is the digitalisation of banking services, entertainment services, health information or the operation of infrastructure, there is a need for a data center that can process information and that has fast and robust digital communication lines.

We are facing explosive growth in data volumes in cloud services, streaming and data processing services. In 2019, each citizen generated approximately 4 GB of data per day. This is predicted to increase to 72 GB in 2025. The consultancy company COWI estimates that installed capacity in the Nordic region will increase by 280-580 MW per year (2).

Each of us uses 40 data centers daily to carry out everything from visits to the doctor to advanced industrial operations, according to a report from the RISE Research Institutes of Sweden (14).

Artificial intelligence (AI) and High Performance Computing (HPC) are currently the most leading trends in digitalisation, and are technologies that require very high data processing capacity.

This has led to new data center projects in Norway being designed to handle such technologies. AI requires up to ten times as much computing power as more traditional computing operations, which places great demands on cooling systems and energy capacity.

The largest Norwegian data center operators

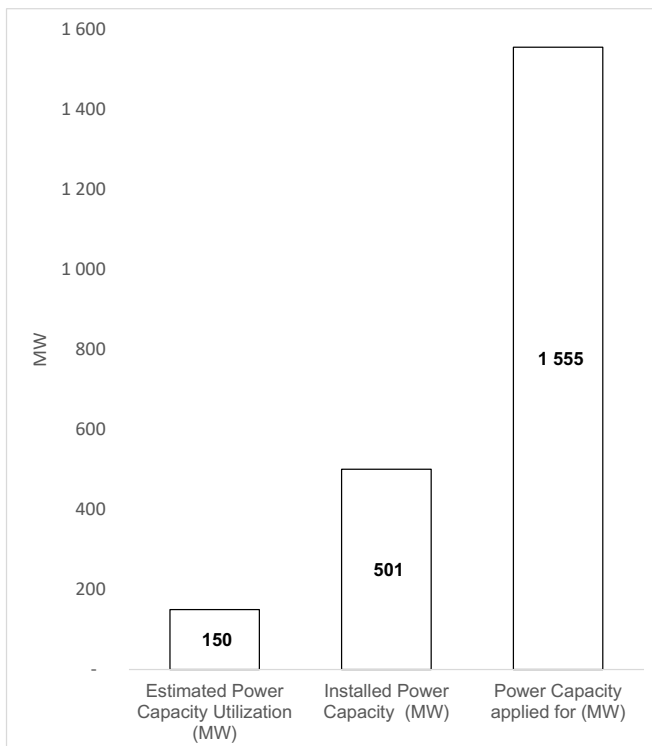
The largest data center players in Norway are organised in Norwegian Data Center Industry (NDI). In addition, the public sector has a number of smaller data centers that meet the needs of government agencies, counties and municipalities. The authorities have not yet prepared an overview of public data centres, hence they are not included in this report.

For the first time, NDI has obtained a quality-assured overview of the activity of all the largest private players in the data center industry.

Although turnover over time will become a good measure of the players' size, it is installed and utilised energy capacity that currently provides the best description of the

players' size. This is due to the fact that many of the data centers are new and in the process of being filled by customers.

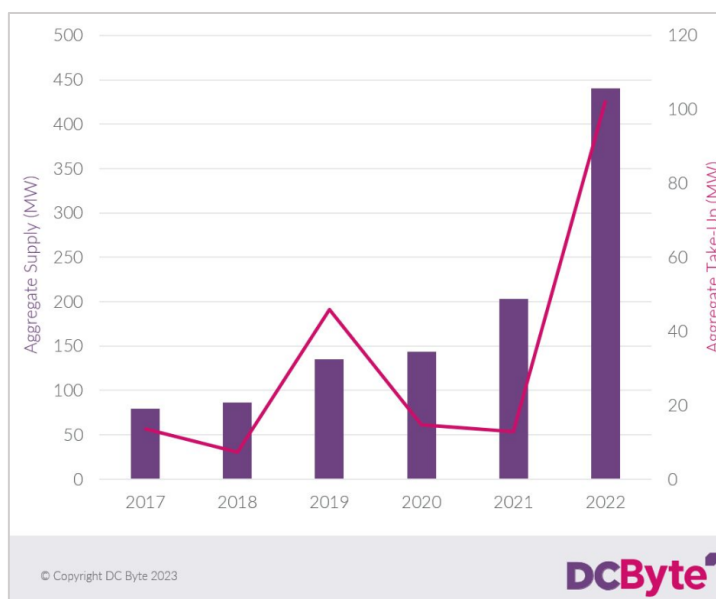
The illustration below shows estimated utilised capacity, installed capacity and capacity applied for, for the largest Norwegian data center operators.



Source: Norwegian Data Center Industry

The overview includes Green Mountain's establishment in Hamar, which will house TikTok, but not Google's possible establishment in Skien, which awaits an investment decision, or Green Mountain's plans in Time municipality in Rogaland, which are under political consideration. Furthermore, there are several projects around Norway that are in an early phase, and which are therefore not included in the overview.

In March 2023, the research company DC Byte calculated what the total installed capacity (Aggregate Supply) and utilised capacity (Aggregate Take-Up) were in the Norwegian data center market.



Source: DC Byte

DC Byte's analysis shows an installed capacity of approximately 440 MW and a utilised capacity of just under 110 MW in the Norwegian market in 2022. This is consistent with NDI's overview as per December 2023, with growth during the year taken into account.

The data center industry's largest players are Green Mountain, Bulk Data Centers, Stack Infrastructure, Lefdal Mine Datacenter, Orange Business and AQ Compute. Together, these companies have an installed capacity of 501 MW, of which approximately 150 MW is currently being utilised. These companies have applied for a further 1,555 MW.

Even with strong growth in the coming years, and including planned establishments by international players, the figures show that the many warnings that the data center industry will challenge traditional industry's access to energy, are significantly exaggerated.

Cryptocurrency mining is not serious data center business

Cryptocurrency mining has received a lot of media attention in recent years. Unfortunately, players who mine cryptocurrency have been wrongly described as part of the Norwegian data center industry. The crypto players have a short-term perspective that depends on extreme fluctuations in the value of the cryptocurrencies they specialise in. Their activities therefore have limited societal benefit, both in terms of jobs and other positive ripple effects locally and nationally.

Strengthened regulation

Norwegian authorities are working to update laws and regulations to take account of the rapid digitalisation of society. The Norwegian Data Center Industry has participated actively in this work and has welcomed better regulation of the industry.

The Electronic Communications Act (ekomloven) is in the process of being updated, and will open for the regulation of the data center industry as a related facility to electronic communications networks and services.

In the summer of 2022, an additional public hearing was held on data center regulation as part of the proposal for a new Electronic Communications Act and new regulations on electronic communication networks and services (4).

In the consultation note, the Ministry of Local Government and Regional Development (KDD), which until 31 December 2023 was responsible for the data center industry, describes the situation as follows:

"Data centers in Norway are important to ensure a robust national infrastructure with fast, secure and flexible digital services throughout the country. A data center is an infrastructure that stores and carries digital services and data, and forms an important part of the digital foundation, in line with infrastructure for electronic communication (ecom). Report to the Storting (white paper) 28 (2020-21) on our common digital foundation refers to the growing fusion of traditional electronic communication and IT, cloud and data center services, where third-party providers are being more closely integrated into the solutions of providers of electronic communications".

The Ministry of Digitalisation and Public Governance (DFD) was established on 1 January 2024 and is now responsible for digitalisation, including the data center industry. The new regulation means that the data center industry's socially critical role is taken care of and a requirement for registration is introduced, providing the authorities with a much better overview. The industry will be overseen by Nkom and by NSM for those companies that will be subject to the Security Act.

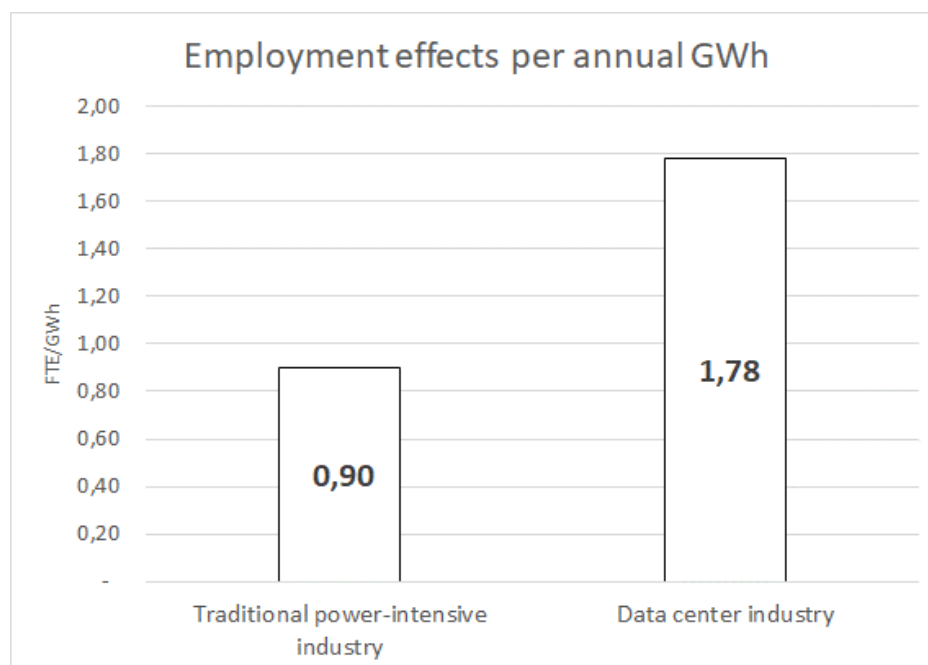
5: Value creation, social benefit and jobs

It is a myth that data centers contribute less value to society than other industries

Data centers contribute with value creation twice as high as traditional power-intensive industry measured against energy consumption, according to Menon Economics. Data centers deliver NOK 1.8 million in value creation effect per annual GWh, compared to NOK 0.9 million per annual GWh in the traditional power-intensive industry (5).

Value creation per employee is highest for data centers among new power-intensive industries. It is only in the power supply and petroleum industries that the average productivity per employee is higher.

The figure below shows employment effects per annual GWh, including ripple effects. Data for traditional power-intensive industry has been calculated by Menon Economics (5). The figure for the data center industry is calculated based on the total number of employees in 2023 and calculated utilised energy capacity in 2023.



Source: Menon Economics (5) and NDI

Data centers create jobs, many of them outside of Oslo

More than half of the data centers in Norway are located outside of the Oslo area, and several of the data centers are located in smaller local areas, where they create employment that would not otherwise be found in the area (6).

Development of the data center industry also contributes to increased activity for suppliers of data center components and services. Data center components must be maintained and replaced, which contributes to a high level of activity.

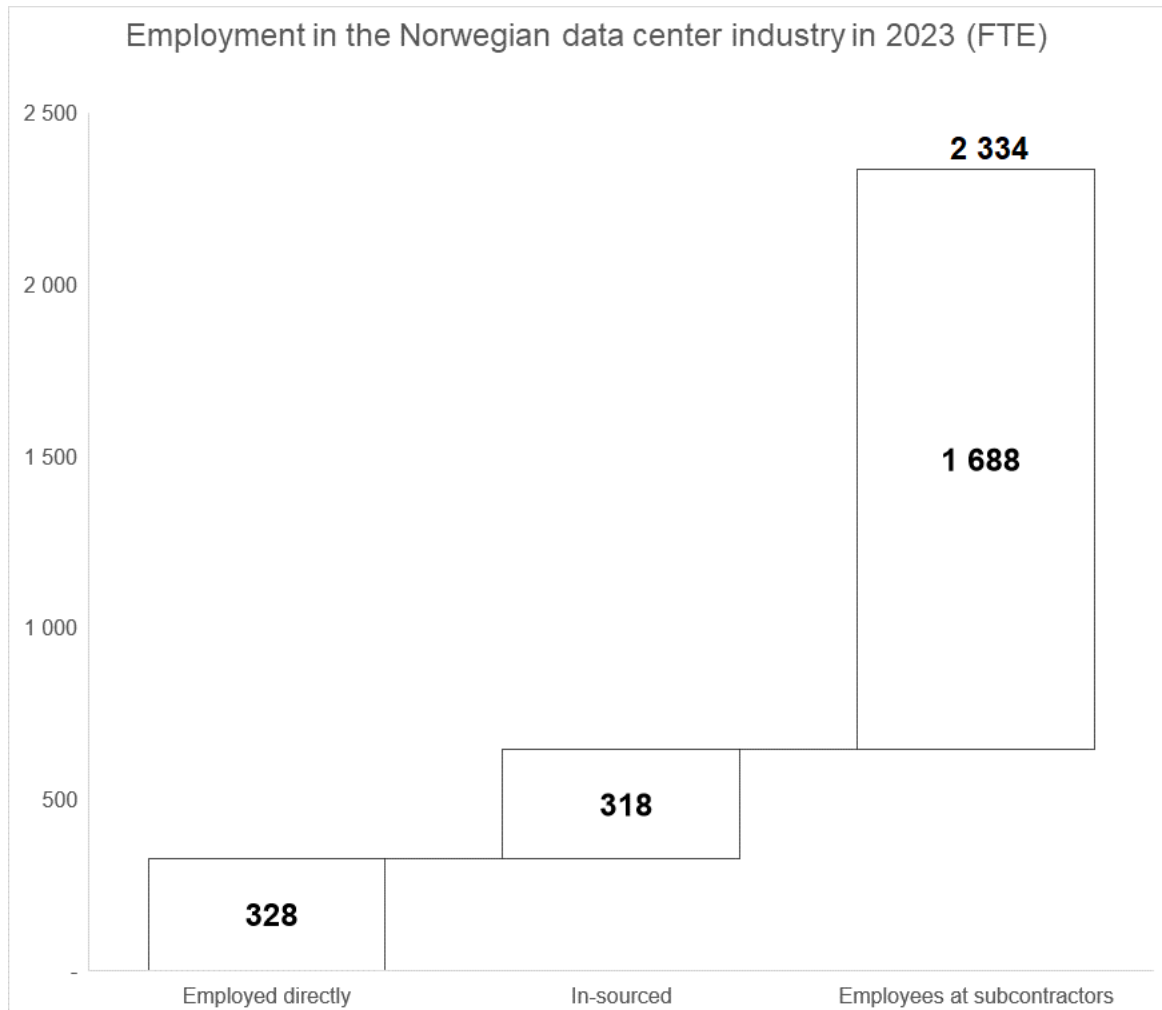
An increasingly large employer with significant local ripple effects

The number of employees in the data center industry in Norway increases every month. The biggest limitation is the lack of professionals in electrical and computer technology. Both NDI and individual operators have taken initiatives towards education authorities and vocational schools to expand the educational offer and encourage pupils and students to consider a career in the data center industry.

The data center industry in Norway employed 646 full-time employees in 2023. Of these, 328 are employed by the data center companies and 318 are hired full-time from specialised subcontractors.

Use of local subcontractors is extensive, and in 2023 the data center industry purchased goods and services and used personnel from 810 Norwegian businesses. A total of 1,688 employees at subcontractors have been engaged full-time for the data center industry in 2023. This is primarily due to the implementation of large development projects, an activity that is expected to increase in the years ahead.

In total, over 2,300 people worked full-time for the data center industry in Norway in 2023.



Source: NDI

Data centers enable growth in Norway's economy

Access to faster, cheaper and more stable data processing will be decisive for growth in GDP over the next ten years. The McKinsey Institute concluded in a report that 70 per cent of businesses would have adopted AI by 2030 and that this could increase GDP growth by 1.2 per centage points (7). This will require a lot of data that is quickly available and securely stored in data centers.

Success without subsidies

Data center operations receive no subsidies and pay the usual electricity tax. In the period 2016 to 2022, data centers had reduced electricity tax, like other power-intensive industries, but have paid normal electricity tax since 2023. The reason for the removal of the tax reduction was a political decision that reduced electricity tax should not benefit

crypto miners. It proved difficult to define a technical distinction between the crypto miners and the serious data center industry, therefore the latter was also imposed a full electricity tax. Power-intensive industry pays a reduced electricity tax that amounts to between 3 and 6 per cent of the rate paid by other businesses, including data centres.

Data centers may contribute to relieve the power grid

Grid offloading using data centers can be performed when power consumption in a region approaches the grid's capacity limit. The data center can then disconnect from the grid and use batteries and generators until the grid load is reduced. However, this can only be done for shorter periods.

This concept is particularly useful in areas where there are large fluctuations in the grid load and where the power grid has limited capacity.

6: Energy and sustainability

Sustainable, but power-intensive

The data center industry is power intensive. Cooling servers requires a lot of energy, and the need will increase with the rise of artificial intelligence (AI) and High Performance Computing (HPC).

With high consumption of energy comes a responsibility that the data center industry in Norway takes seriously. All data center operators who are members of the Norwegian Data Center Industry are working on plans for heat recovery at their data centres. Several players already have such systems in place, including systems connected to district heating systems.

No other country has come further than Norway in the effort to make the data center industry more sustainable.

In addition to heat recovery, ever-improving server technology, more efficient building construction and improved cooling technology also contribute to reducing the growth in power consumption.

Myths and misinformation about power consumption

During 2023, new data center projects have led to much debate about how Norway's renewable energy should be prioritised.

The data center industry is accused of planning to use huge amounts of energy that will displace traditional industry and push electricity prices sky high. Some have gone so far as to claim that the industry as a whole has asked for new power equivalent to 50 per cent of Norway's total power production (8). As pointed out earlier in this report, that is not correct.

A lack of knowledge and a desire to protect special interests may be part of the explanation for these accusations, and might be based, among other things, on the following:

1. Interpreting installed power as equal to consumption: Installed power is measured in MW, consumption is measured in MWh (megawatt hours). An industrial operator with an installed capacity of 100 MW will use 876,000 MWh (0.876 TWh), that is 100 MW multiplied by the number of hours in a year, if full capacity is used every single hour throughout the year. It is extremely rare that an industrial company or a data center use full power every day of the year.

2. Conscious or unconscious misinterpretation of power requirements. It is important to distinguish between current installed power, registered applications for the desired network power and long-term forecasts of what an operator might need in 20 to 30 years.

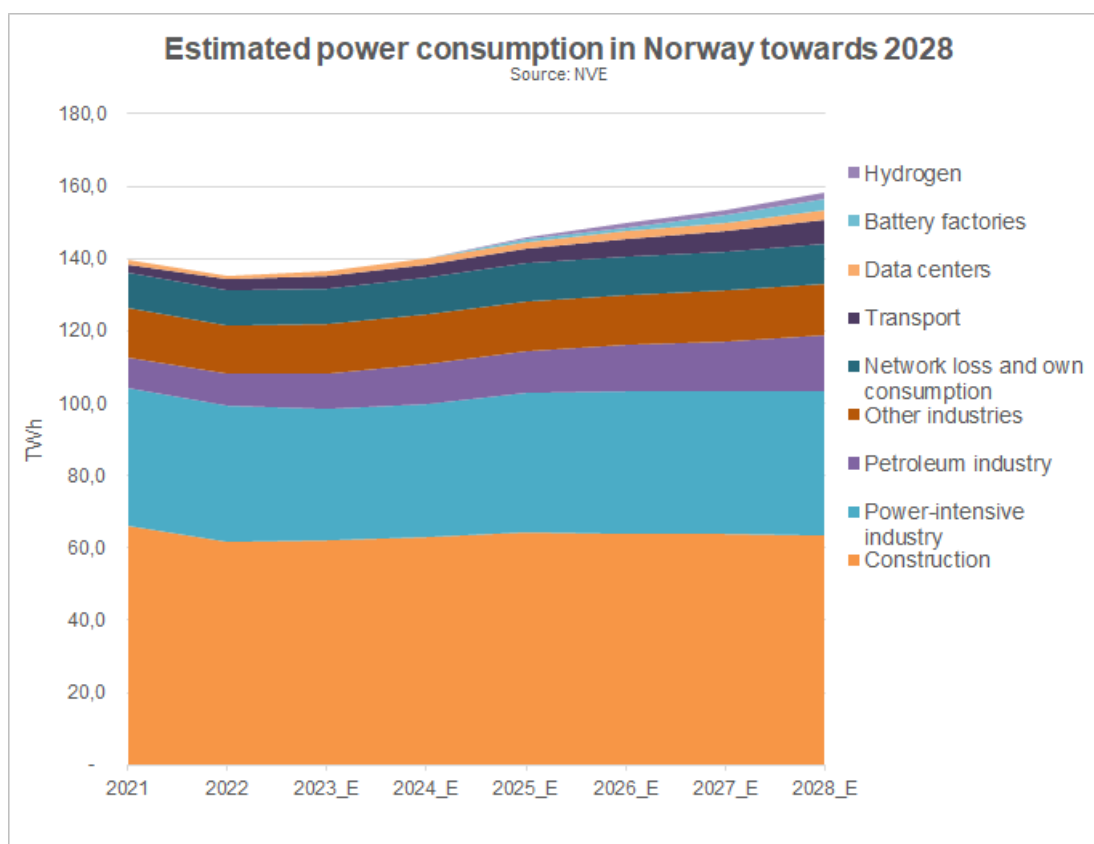
The combination of these two logical flaws is apt to create unnecessary anxiety. For example, Google has applied for a power draw of 860 MW at its planned data center facility at Gromstul in Skien municipality (12). According to the application, this is the maximum power requirement with an horizon of 10 to 20 years. This does not mean that Google intends to use 7.5 TWh today, corresponding to 860 MW power utilisation every hour for a whole year and five per cent of current electricity production in Norway. This means that in 2033, 2043 or later, Google may need to use an output of up to 860 MW in certain periods.

This is what it actually looks like

Both NVE and Statnett prepare detailed forecasts for future energy needs in close dialogue with business and industry, including the data center industry.

NVE's forecast for Norway's short-term power balance shows that the data center industry today uses around 1 per cent of Norway's power production in 2023 and that this may increase to 1.9 per cent in 2028. In comparison, the power-intensive industry uses around 27 per cent of Norway's power production with a slight reduction in the forecast to 25 per cent in 2028. These are businesses that are largely controlled by foreign interests, for example Chinese or American, and which also receive government subsidies, such as reduced electricity tax and CO2 compensation.

The figure below shows NVE's calculation of Norway's short-term power balance towards 2028, distributed among various industries and sectors (9).



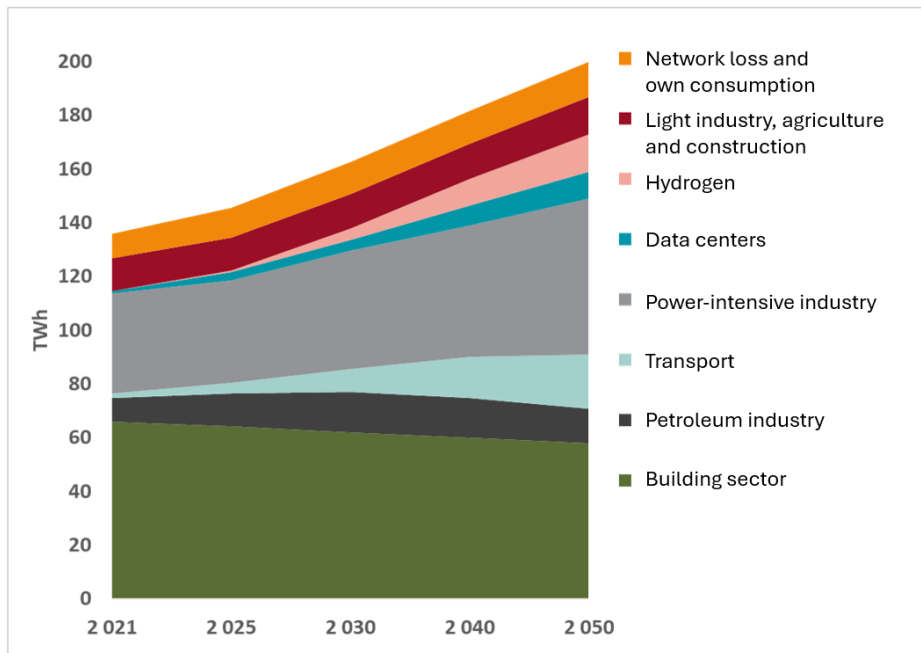
The table below shows NVE's estimates of Norway's short-term power balance until 2028, with the share of power consumption per sector.

TWh	2021	2022	2023_E	2024_E	2025_E	2026_E	2027_E	2028_E
Construction	47,2 %	45,7 %	45,7 %	45,1 %	44,0 %	42,7 %	41,4 %	40,1 %
Power-intensive industry	27,4 %	27,8 %	26,7 %	26,2 %	26,4 %	26,3 %	25,7 %	25,3 %
Petroleum industry	5,9 %	6,6 %	7,2 %	7,9 %	7,9 %	8,3 %	8,9 %	9,9 %
Other industries	9,6 %	10,1 %	10,1 %	9,9 %	9,5 %	9,3 %	9,2 %	9,0 %
Network loss and own consumption	7,1 %	7,2 %	7,2 %	7,1 %	7,2 %	7,1 %	7,1 %	7,0 %
Transport	1,6 %	2,1 %	2,4 %	2,6 %	2,9 %	3,2 %	3,6 %	4,0 %
Data centers	0,7 %	0,8 %	1,0 %	1,1 %	1,2 %	1,4 %	1,6 %	1,9 %
Battery factories	0,0 %	0,0 %	0,0 %	0,1 %	0,5 %	0,7 %	1,2 %	1,7 %
Hydrogen	0,0 %	0,0 %	0,0 %	0,1 %	0,4 %	0,8 %	1,0 %	1,3 %
Sum elbruk (TWh)	100,0 %	100,0 %	100,0 %	100,0 %	100,0 %	100,0 %	100,0 %	100,0 %

Source: NVE

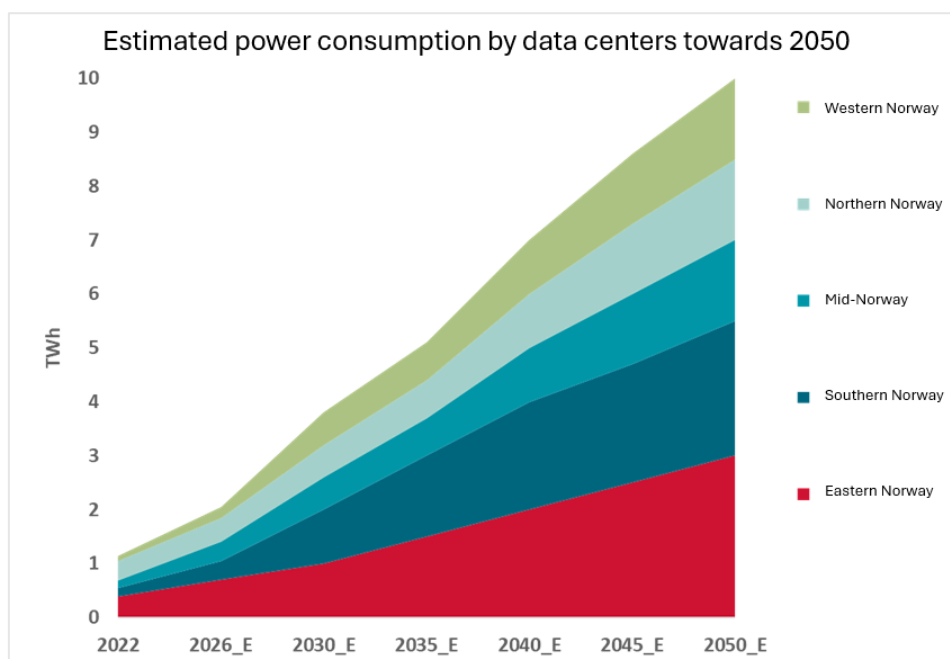
NVE has also made long-term forecasts towards 2050. They estimate that energy consumption in Norway may increase from just under 140 TWh in 2022 to over 200 TWh in 2050. In 2050, they forecast that the data center industry will account for approximately 5 per cent of the total energy consumption, or 10 TWh (10).

The figure below shows NVE's forecasts from 2021 until 2050 and how energy consumption is distributed by sector.



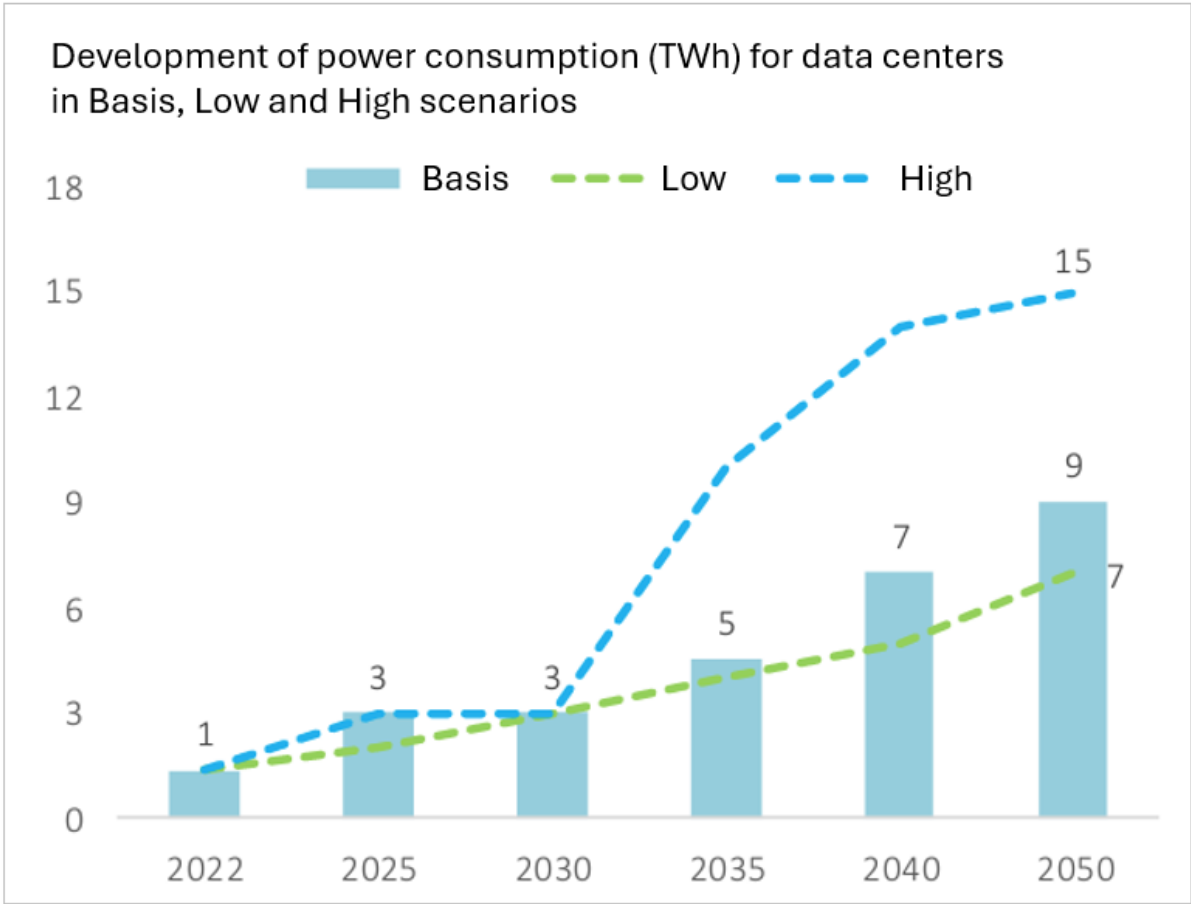
Source: NVE

The figure below shows NVE's long-term estimate of power use for data centers broken down by region in Norway. The estimate shows that the value creation from the data center industry will be fairly evenly distributed throughout Norway, with a somewhat larger concentration in Eastern Norway and Southern Norway.



Source: NVE (10)

Statnett's forecasts differ somewhat from NVE's forecasts. Statnett forecasts that the data center industry's power consumption in 2050 may vary from 7 TWh to 15 TWh, where 9 TWh is their base forecast. The base forecast is 1 TWh lower than NVE's forecast.



Source: Statnett (11)

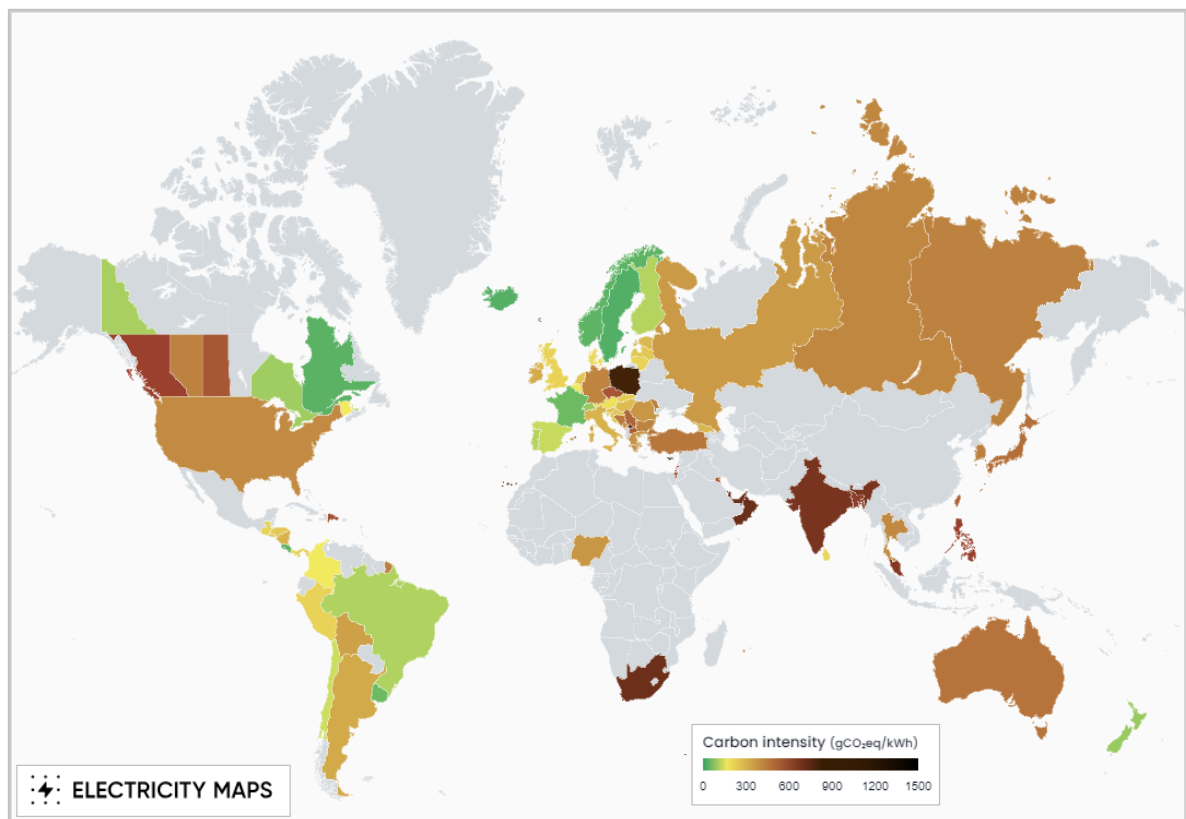
Why it makes sense to locate data centers in Norway

Data centers located in Norway only use renewable energy and also have lower energy requirements for cooling due to the cold climate. It is therefore beneficial for the global climate that large international players move their data here.

Both owners, customers and environmental organisations are putting increasing pressure on business and industry to get them to act responsibly, not least from an environmental and climate perspective. Localisation of energy-intensive data centers in Norway helps customers and the industry meet these requirements.

The figure below shows the average energy mix in a number of countries from December 2022 to November 2023. The overview shows that Norwegian consumption consists of 96 per cent renewable energy and that the emission is 36 grams of CO₂ equivalents per kWh. This emission is primarily due to the use of gas in the traditional power-intensive industry.

So far, Germany has been a popular country for European data center locations. In the last 12 months, Germany has had an energy mix of 57 per cent renewables, 25 per cent coal and the rest biomass and gas. This resulted in an emission of 421 grams of CO₂ equivalents per kWh, almost 12 times higher than the energy mix in Norway.



Source: Electricity Maps

Data center security is national security

Data centers function mainly to operate and maintain critical infrastructure on which the country depends. In contrast, media coverage may give the impression that data centers only consume large amounts of power and store social media content. If a data center is shut down, it is not just access to viral videos that disappears, we may also lose the emergency networks, safety alarms may stop working, and the trains and the banking system may stop working. Issues of data center security are also issues of national security.

How dependent are we on data centers?

Earlier this year, inFuture, on behalf of Abelia, Skien municipality, and the Norwegian Data Center Industry, presented the report "A day without internet – the function of data centers in our digital society"¹. The examples above are taken from this report, which estimates daily costs of NOK 1.3 billion in the event of an extensive network outage.

The report concludes that a major interruption can have major consequences for health and safety. The data centers are referred to as the very heart of our internet-based everyday life, and if the heart does not beat, this will have consequences.

According to Statistics Norway, 85.4 per cent of the country's municipalities used cloud services in 2018, and in 2023, the number was 98 per cent.² 93 per cent of private individuals also used the internet daily in 2023.³ When authorities, municipalities and private individuals connect online, the data centers are the basis for all information exchange and data storage. The term "cloud" is often used to refer to the storage and exchange of data. It is important not to forget that the cloud is in fact the network of data centers that exists both in Norway and elsewhere. Data centers enable digital everyday life.

What are the data center operators doing to secure the digital infrastructure?

Managing critical infrastructure is something data center operators take very seriously. Large resources are used to secure both physical and digital infrastructure.

The customer lists at the various data centers are also often kept secret. From time to time, operators in the industry face claims that this is to hide the activities of various companies. But in reality, this is a matter of security. Your online bank, your medical record, and your tax return are stored in one or more data centres. We believe it is a good thing that the exact location of this information is not publicly known, and hence accessible for people with criminal intent.

Secure data center operations are based on reliable fiber connections and power supply. Redundancy is in many cases a term for something unnecessary, but for the data center industry, redundancy is an important measure to ensure stable operations. Power and fiber outages can occur as a result of a number of reasons – extreme weather, overload, and sabotage are just a few. By having multiple fiber connections and sources of power, not only are we more confident that our data centers have the most uptime possible, but society can also be assured that data is available when needed.

¹ <https://www.abelia.no/contentassets/e09f15e7518c490a953d6c618bb4b0ad/et-dogn-uten-internett.pdf>

² <https://www.ssb.no/statbank/table/12032/>

³ <https://www.ssb.no/statbank/table/11124/>

Securing the fiber cables that go into Norwegian data centres, and the power grid we are connected to, is not a task the industry can solve alone. We are therefore pleased that the Norwegian authorities have put regulation of our industry on the agenda.

What are the authorities doing?

For a long time, the Norwegian authorities have worked to update laws and regulations to take account of the rapid digitalisation of society, a process in which the Norwegian Data Center Industry has been an active participant.

The new Electronic Communications Act will include the data center industry. Work is now underway on regulations which will give Norwegian authorities better control and a far better overview of the extent of the industry, all factors that will contribute to ensure a high level of quality for data center customers.

In a public consultation response in connection with the legislative work, the Ministry of Local Government and Regional Development stated:

"Data centers in Norway are important to ensure a robust national infrastructure with fast, secure, and flexible digital solutions throughout the country."⁴

In March 2023, the Minister of Local Government and Regional Development also stated that data centers are part of the country's digital infrastructure and that it was important for the authorities to have an overview and control over the businesses in the industry.⁵

Our industry will be overseen by the Norwegian Communications Authority (Nkom), and by the Norwegian National Security Authority (NSM) for those subject to the Security Act.

As late as 5 December 2023, it became known that the government had refused the Norwegian National Security Authority's recommendation to develop a state-owned cloud and rather go for a solution where a national cloud is operated in collaboration with commercial players.⁶ This shows that the Norwegian authorities have confidence that the Norwegian data center industry can deliver secure, quality services to the public sector. It is a responsibility we are prepared to accept.

The dialogue with the authorities and the measures the authorities have implemented in recent years is a confirmation and recognition of the critical role our industry will play in society the coming years. Data center security is national security.

⁴ <https://www.regjeringen.no/no/dokumenter/norske-datasenter/id2867155/?ch=1>

⁵ <https://nkom.no/aktuelt/regjeringen-styrker-den-nasjonale-kontrollen-med-datasentre-i-norge>

⁶ <https://www.digi.no/artikler/nasjonal-sky-inviterer-leverandorer-til-videre-utredning/540647>

Enclosure: Overview of NDI members' data centers in Norway

NDI member	Data center	Heat Re-use Systems
AQ-Compute	AQ-OSL1, Hønefoss	Projected
Blix Solutions	BDC Oslo	Local system, projected heat re-use
Bulk Data Centers	N01 Kristiansand	Projected
Bulk Data Centers	OS-IX Oslo	Projected
Eidsiva	Gjøvik	Projected
Global Connect	Oslo	Local system
Green Mountain	SVG1-Rennesøy	Projected
Green Mountain	RJU1-Rjukan	Projected
Green Mountain	OSL1- Enebakk	Not projected
Green Mountain	OSL2-Hamar	Projected
Lefdal Mine Datacenter	Lefdal Mine Datacenter	Projected
NHDC	Oslo	Local system
Orange Business	OSL3 Grorud	Local system
Orange Business	OSL5 Lørenskog	Local system
Stack Infrastructure	OSL01A - Ulven	District heating
Stack Infrastructure	OSL02A -Rosenholm	Local system
Stack Infrastructure	OSL03 - Fetsund	Local system
Stack Infrastructure	OSL04 - Hobøl	Local system

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Glossary

Co-location	Also referred to as «colo». Used about a data center where several independent users rent space
Data center campus	A larger area where several data centers are located
ERE	Energy Reuse Effectiveness
GW	Gigawatt (measure of effect)
GWh	Gigawatt-hours (measure of consumption)
Hyperscaler	A large international company with such a large requirement for data processing and storage that they operate or rent entire data centers. Typical hyperscalers are AWS, Google and Meta
Installed effect (MW)	Total installed transformer or UPS capacity
MW	Megawatt (measure of effect)
MWh	Megawatt-hours (measure of consumption)
PUE	Power Utilisation Efficiency
Redundancy	Abundance. In a security context, it can mean having multiple fiber cables or power connections to a data center so that the center can continue to operate even if a connection is compromised
Circular park	A business park where the businesses in the park can reuse each other's resources, for example greenhouses or land-based farming that can utilise the waste heat from a data center
TW	Terawatt (measure of effect)
TWh	Terawatt-hours (measure of consumption)
UPS	Uninterruptible Power Supply. System that uses batteries to keep a data center running in the event of a power outage
Heat re-use	System that utilises the residual heat in the cooling water from a data center for other purposes, such as district heating, heating greenhouses, land-based farming or wood drying
WUE	Water Utilization Efficiency



The Norwegian Data Center Industry (NDI) is a politically neutral organization and a unified voice for the data center industry towards the market and public agencies and authorities. We represent a total of 55 players in the industry, both public and private, with the intention of contributing to stability and predictability in the regulatory landscape, and to facilitate development and growth in the Norwegian data center industry.

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