

Research and development (R&D) survey 2020

NB! This form shows the questions in the survey.

Layout and design differ some from the electronic form in the web-portal Altinn.

Log on to <https://www.altinn.no/> to answer the survey.

If you need help completing the form, please contact by:

- e-mail: datafangst@ssb.no
- telephone: 62 88 51 90

Open on weekdays between 09–15.

Do only report for your own enterprise. If your enterprise is part of an enterprise group, do not answer for other enterprises in the group.

For more information, we refer to the guidelines given on the last page.

Not for reporting

What shall be considered as research and development (R&D)?

Both research and development (R&D) are creative work undertaken on a systematic basis in order to increase the stock of knowledge, and to devise new applications of available knowledge. For an activity to be considered R&D, it must satisfy five core criteria. The activity must have an appreciable element of novelty, it must be creative, there has to be some uncertainty about the final outcome, it must be systematic and lead to results that could possibly be reproduced.

- Research is systematic work in order to increase the stock of knowledge.
- Development is systematic or experimental work drawing on existing knowledge in order to develop new or significantly improved products or processes.

For more information, we refer to the guidelines given on the last page.

1. Did your enterprise engage in intramural research and development (R&D) in Norway during 2020?

R&D activity can be performed by own personnel or contracted personnel.

R&D activity can be performed by a R&D department/-centre or by other departments in the enterprise.

Also include R&D performed on behalf of others and R&D that is a part of deliveries to customers.

☐ Yes

☐ No → Go to question 11

The next questions are about persons employed in the enterprise that took part in the enterprises' own R&D activity in 2020.

Include:

- both full time and part time employees that have worked on R&D.
- employees in a R&D department/-centre; in case such a department/centre.
- employees that worked with R&D in other departments.
- employees in administration, and persons in supporting functions that have been involved in R&D.

Do not include contracted personnel.

2. How many persons employed in your enterprise where involved in intramural R&D activities in 2020?

If the number of persons that worked with R&D varied much over the year, please give an average. (?)

(?) R&D-persons should spend at least 0,1 man-years (i.e. 10 % of their work time) on R&D activities.

	Number of R&D persons	Of which women
With PhD.....	<input type="text"/>	<input type="text"/>
With higher degree education (Master's degree or similar).....	<input type="text"/>	<input type="text"/>
With lower degree or no education	<input type="text"/>	<input type="text"/>
Number of employed R&D persons in total.....	<input type="text"/>	<input type="text"/>

2.1 How many R&D man-years did the employees perform in 2020?

A full time employee working 50 % on R&D has performed 0,5 R&D man-years.

R&D man-
years
performed

[X] with PhD.....

	,	
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[X] with higher degree education (Master's degree or similar).....

	,	
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[X] with lower degree or no education.

	,	
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R&D man-years performed in total

	,	
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2.2 Were any of the [X] R&D persons with PhD or higher degree education foreign nationals?

☐ Yes

☐ No

How many were foreign nationals?

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R&D persons

2.3 What type of tasks did the R&D persons employed in the enterprise perform in 2020?

Number of
R&D
persons

Number of R&D
man-years

Product- or process developers, researchers and project managers.....

Have developed new knowledge, products, processes, methods or systems, and/or planned and managed R&D projects

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	,	
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Other R&D personnel (including technicians).....

Support personnel for R&D, including technicians that execute R&D tasks defined by researchers/developers. For example machinists, laboratory personnel, programmers, administration directly engaged in an R&D project.

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Not distributed

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	,	
--	---	--

In total (collected from question 2 and 2.1).....

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	,	
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3. Were contracted persons (beyond own employees) involved in the enterprise's R&D activity in 2020?

Contracted R&D persons have to be integrated in the enterprises' intramural R&D activity. This means that they have worked together with the enterprises' own R&D personnel and have been subject to the enterprises' direct management. It could for example be consultants.

Acquired R&D-services should not be listed here, but under question 11. (?)

(?) Acquired R&D services is when others perform R&D on behalf of the enterprise without being integrated into the enterprises' own R&D activity. External persons performing such R&D should therefore not be counted as contracted R&D personnel. R&D services acquired from others could for example be outsourced.

☐ Yes

☐ No

How many were contracted?

Contracted R&D persons

How many R&D man-years did the contracted persons perform?

R&D man-years

A question regarding 2021.

4. How many employed persons and man-years do you estimate that the enterprise will use for own R&D activity in 2021?

Include only own employees, do not include contracted personnel.

R&D-persons

R&D man-years

5. Specify the expenditures for R&D performed within the enterprise in 2020.

All costs shall be specified without VAT. For more information, we refer to the guidelines given on the last page.

Intramural current costs for R&D

Compensation of R&D employees	<input type="text"/>	000 NOK
Cost of the [X] man-years performed by contracted R&D personnel (specified in question 3).....	<input type="text"/>	000 NOK
Other current costs to R&D (without depreciation).	<input type="text"/>	000 NOK

(Acquisition of R&D services shall not be specified here, but in question 11)

Investment costs for R&D (purchase value), without depreciation

Buildings, property, etc. for R&D.....	<input type="text"/>	000 NOK
Machinery, equipment, instruments, etc. for R&D.....	<input type="text"/>	000 NOK
Total intramural R&D expenditure	<input type="text"/>	000 NOK

5.1 Were the expenditures for R&D in 2020 affected as a direct consequence of the pandemic?

That is, changes that would probably not have taken place in a normal situation.

	Increase	Decrease	Not affected
Intramural current costs for R&D			
Compensation of R&D employees.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost of man-years performed by contracted R&D personnel.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other current costs to R&D.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Investment costs for R&D (purchase value), without depreciation			
Buildings, property, etc. for R&D.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Machinery, equipment, instruments, etc. for R&D.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

A question regarding 2021.**6. How much do you estimate that the enterprise will use for intramural R&D in 2021?**

000 NOK

7. How was the R&D expenditure distributed on the following technological fields?

- **Biotechnology:** Use of natural sciences and technology on living organisms and parts, as well as products and models of these, so that living- and non-living material is altered to achieve knowledge, products and services. The definition of biotechnology does not include separate subjects, including ethical, juridical and societal aspects.
- **Nanotechnology:** New techniques developed for synthesis and processing for the design of functional and structural materials, components and systems, where dimensions and tolerance in the spectrum 0,1 to 100 nanometers is of crucial importance. Ethical, juridical, societal or health/environment/safety aspects with nanotechnology.
- **New materials, except nanotechnology:** Functional materials (materials with certain chemical, physical or biological traits). Materials where the traits purposefully change when using nanotechnology should be listed under nanotechnology.
- **Information- and communication (ICT):** ICT-technology such as artificial intelligence, robotics and automation, smart components, hardware, communication technology, the internet of things, software and user interface. Digital security, such as e.g. encryption, biometry and privacy. Digital transformation/implementation of ICT in the transfer between technology and humans, organizations and/or society; use of digital processes to simplify, streamline and optimize business models, organizations, products, services and processes.

Biotechnology		%
Nanotechnology		%
New materials, except nanotechnology.....		%
Information- and communication technology (ICT)		%
Other fields of technology.....		%

Please specify other fields of technology

Not distributed..... **100** %

8. Did the enterprise have any R&D activity in some of the following thematic fields?

Please mark all the relevant fields. If your R&D activity overlaps between fields, mark all of these.

A. Energy

- ☐ Renewable energy: Water, wind, bio energy, sun, geothermic, waves, etc.
- ☐ Energy efficiency and change: Energy saving in general, such as within construction, manufacturing, transport, petroleum production, power production and energy supply, as well as within the energy system.
- ☐ Petroleum: Offshore exploration and extraction of petroleum resources, field development, production and transportation, as well as HMS in the oil- and gas industry. Maritime operations linked to petroleum should be reported under Maritime. Energy efficiency improvement/Environment is to be reported under, in turn, Energy efficiency improvement- and restructuring and Environment.
- ☐ Other energy: Nuclear power and energy production from coal.

B. Climate

- ☐ CO₂ handling: Catching, transport and storing of CO₂.
- ☐ Climate technology and other emission restrictions: Technology for reduction of climate gas emissions and other climate drivers. Social framework conditions and instruments for emission reductions.
- ☐ Climate and climate change adaption: The climate system, climate changes and consequences of, and adaption, of these (do not include climate technology/emission reductions).

C. Environment

- ☐ Environmental technology: Technologies that directly and indirectly improve the environment, except fields mentioned above. Includes technologies for minimising pollution with help from cleansing, more environmental friendly products and production processes, more efficient resource management, noise reduction and technological systems for reducing environmental impact.
- ☐ Onshore environment and society: Biological diversity, ecosystems and ecosystem services, pollution (except climate related), waste and recycling economy, onshore use, cultural monuments and – environments. (?)
- (?) Circular economy: R&D that contributes to effective use of resources, products and waste, ensuring that it remains in the economy in several stages to reduce damage to the environment and contribute to sustainability.

Other fields

- ☐ D. Agriculture: Production, processing and market for agricultural products (agriculture, including livestock farming and forestry).
- ☐ E. Fishery: Fishing and harvest, processing and market for marine organisms. (Research on management shall be reported under Marine).
- ☐ F. Aquaculture: Production, processing and market for aquaculture products.
- ☐ G. Marine: Marine ecosystems. Surveillance management and influence on the sea and coastal area resources and environment. Includes possibilities for new bioresources.
- ☐ H. Maritime: Design, construction and operation of ships for sea transport and all types of maritime operations, as well as services related to this.
- ☐ I. Health and care: Health and health promotion conditions, prevention, causal mechanism of diseases, reduction and treatment of diseases and functional reductions. Organizing and efficiency improvement of services in the health and care sector. Clinical and pharmaceutical R&D.
- ☐ **The enterprise did not have any R&D on any of the fields above.**

8.1 How large was the percentage share of intramural R&D expenditure in 2020 for the fields you marked above?

The main areas (energy, climate, environment etc.) can overlap. The underareas within each main area should not overlap.

A. Renewable energy		%
A. Energy efficiency and -change		%
A. Petroleum.....		%
A. Other energy.....		%
B. CO2 handling		%
B. Climate technology and other emission reductions		%
B. Climate and climate change adaption.....		%
C. Environmental technology.....		%
C. Onshore environment and society.....		%
D. Agriculture.....		%
E. Fishery		%

F. Aquaculture.....

G. Marine.....

H. Maritime.....

I. Health and care.. ..

	%
	%
	%
	%

8.2 Did the enterprise start any new R&D projects in 2020 as a direct consequence of the corona situation?

That is, projects that would probably not have been started in a normal situation.

- ☐ Yes
- ☐ No

8.3 In which areas did the enterprise start new R&D projects in 2020 as a direct consequence of the corona situation?

Technological fields

- Biotechnology..... ☐
- Nanotechnology..... ☐
- New materials, except nanotechnology..... ☐
- Information- and communication technology (ICT)... ☐
- Other fields of technology..... ☐

Thematic fields

- Renewable energy..... ☐
- Energy efficiency – and change..... ☐
- Petroleum..... ☐
- Other energy..... ☐
- CO2-handling..... ☐
- Climate technology and other emission reductions... ☐
- Climate and climate change adaption..... ☐
- Environmental technology..... ☐
- Onshore environment and society..... ☐
- Agriculture..... ☐
- Fishery..... ☐
- Aquaculture..... ☐
- Marine..... ☐
- Maritime..... ☐
- Health and care..... ☐
- Other thematic fields..... ☐

8.4 Did the enterprise postpone or interrupt any R&D projects in 2020 as a direct consequence of the corona situation?

That is, projects that would probably not have been postponed or interrupted in a normal situation.

- ☐ Yes
- ☐ No

In question 5 you reported that the enterprise had intramural expenditures to R&D in 2020 amounting to NOK [X] 000.

9. How were the intramural R&D expenditures funded?

Own funding

Own sources (sales, new equity)..... 000 NOK

If any of this was venture capital, please specify amount..... 000 NOK

Loan from financial institutions (also Innovation Norway)..... 000 NOK

External private funding

Norwegian enterprises in enterprise your group 000 NOK

Foreign enterprises in enterprise your group..... 000 NOK

Other Norwegian enterprises/institutions..... 000 NOK

Other foreign enterprises/institutions..... 000 NOK

Public funding

The Norwegian Research Council..... 000 NOK

SkatteFUNN (tax reduction of intramural R&D, including disbursement)..... 000 NOK

Support from Innovation Norway..... 000 NOK

Ministries, directorates, counties, municipalities or others.... 000 NOK

Please specify:

Other funding (from abroad)

Funding from EU institutions (not national authorities)..... 000 NOK

Other foreign funding..... 000 NOK

Not distributed..... 000 NOK

10. Did your enterprise sell or deliver R&D services to others in 2020?

- ☐ Yes, to enterprises within your enterprise group
- ☐ Yes, to other enterprises, institutes, public authorities, etc. (contracts/commercial sale)
- ☐ No

10.1 What was the value of R&D services delivered to enterprises within your enterprise group?

Units in Norway..... 000 NOK

Units abroad..... 000 NOK

10.2 What was the value of R&D services delivered to other enterprises, institutes, public authorities, etc?

Units in Norway..... 000 NOK

Units abroad..... 000 NOK

11. Did your enterprise acquire R&D services from others during 2020?

Acquired R&D is performed by others on behalf of the enterprise. It could be parts of an R&D project, or an entire R&D project.

- Include R&D services acquired from external actors, also R&D acquired from enterprises within the enterprise group.
- Do not include contracted personnel integrated in the enterprises' own R&D activity. (This is to be reported in question 3 and 5).

☐ Yes

☐ No

11.1 What was the value of the acquired R&D services from others in 2020?

Specify all costs without VAT.

Do not include the expenditures for contracted personnel or intramural R&D costs specified in question 5.

Norwegian enterprises in your enterprise group		000 NOK
Foreign enterprises in your enterprise group		000 NOK
Other Norwegian enterprises		000 NOK
Other foreign enterprises		000 NOK
Research institutes and universities in Norway		000 NOK
Research institutes and universities abroad		000 NOK
Professional institutes etc. (e.g. contingents, fees, licenses, grants, etc.)		000 NOK
Total extramural R&D expenditures		000 NOK

12. Please specify the sums for each of the enterprises' establishments (types of activity) (?)

[illegible]

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11

If you have any comments to the information you have given, you can write them here:

The information below is the information SSB has about your enterprise's contact person.

If the information is incorrect or insufficient, please update in the relevant fields below:

Name

Phone

E-mail

Guidelines

This is a shortened version of the Norwegian set of guidelines at Statistic's Norway's data collection page for R&D

<https://www.ssb.no/innrapportering/naeringsliv/fou>

What is research and development (R&D)?

R&D comprises creative work undertaken in order to increase the stock of knowledge and to devise new applications of available knowledge.

Research is systematic work aimed at achieving new knowledge. **Development** is systematic or experimental work that uses existing knowledge to develop new or improved materials, products or processes. R&D does not need to be located in specific R&D departments, it could also be organized in a different manner, or be a part of the enterprise's other activities.

Yet, it can be difficult to separate R&D from ordinary activity. For an activity to be considered an R&D activity, it has to satisfy five core criteria:

1. **Novelty:** R&D activity should be aimed at acquiring new knowledge or discover new uses for existing knowledge. The novelty of new findings is compared to the existing stock of knowledge in the industry.
2. **Uncertainty:** The final outcome of the R&D activity, including spending of resources and the end result, if not obvious beforehand, even for a person with a fundamental understanding of the field.
3. **Creative:** R&D activity is based on original, not obvious, concepts and hypotheses.
4. **Systematic:** R&D activity is planned and budgeted, oftentimes organized as an R&D project, but it could also be targeted activity performed by a person or group.
5. **Transferrable/reproducible:** R&D activity should increase the stock of knowledge within its field, therefore, others should be able to potentially transfer or reproduce the work.

What is R&D activity?

An "R&D activity" is the sum of actions deliberately undertaken by R&D performers in order to generate new knowledge or new products/processes. There are three types of R&D activities:

- **Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge without any particular application or use in view.
- **Applied research** is original investigation undertaken in order to acquire new knowledge, directed primarily towards a specific practical aim or objective.
- **Development** is systematic work, drawing on existing knowledge gained from research or practical experience, which is directed to:
 - producing new or improved materials, products or devices.
 - create new or improved processes, systems and services.

Oftentimes, R&D activities can be organized in "R&D projects". Each R&D project consists of a set of R&D activities, is organized and managed for a specific purpose, and has its own objectives and expected outcomes, even at the lowest level of formal activity. R&D can also be targeted activities performed by a person or a group.

R&D activities can be

- **product targeted**, i.e. developing new or improved goods or services with respect to quality and usage (not cosmetic changes or product diversification).
- **process targeted**, i.e. make new or improved production-techniques with the usage of improved factor inputs (materials, equipment, energy, labour) and improved systems for controlling production and administration.

R&D integrated in development work for others

R&D can be performed for own use in your enterprise, or it may be an integrated part of a development contract for customers. In such projects, it is often a need for new knowledge and new solutions, and technology development and troubleshooting often requires R&D. Although it may be difficult to define the R&D part in this kind of contract, this R&D activity shall also be reported.

How to distinguish R&D activities from other activities?

Examples of activities that are not R&D:

- A regular construction and planning process.
- Implementation of established and well-known technology in the enterprise.
- Ordinary upgrades (e.g. of equipment, materials).
- Ordinary upgrades or use of software and hardware for a new use or a new purpose.
- Routine tests and quality controls.
- Technical service, problem solving in production and engineering products using existing techniques.
- Pre-planning or other routine work in the start phase of production.
- Service after sale or error checks and/or fixing bugs.
- Courses and skill development outside R&D projects.

Borderline cases between R&D activity and other activities

- Construction of prototypes and trial production, industrial design, industrial engineering, tooling up and large-scale projects with continued development is considered R&D. If the tests are completed, the first units of the trial production are not considered R&D.
- When software and hardware are parts of an R&D project, they are classified as R&D. The same goes for research and development conducted on software and hardware. It is not considered R&D if the activity involves ordinary upgrades or general use of software and hardware for a new use or a new purpose.
- Industrial design is considered R&D if the design is necessary to run the R&D project.
- Industrial engineering and tooling up is considered R&D when it is tied to the development of new products and processes. When it is part of an ordinary production process, it is not considered R&D.
- Trial production is R&D if the production involves full-scale testing and subsequent further design and engineering. All other associated activities are not R&D.
- Patent and license work is not considered R&D unless this work is connected directly with R&D projects. Exclude all administrative and legal work needed to apply for patents and licenses.
- Data collection is not considered R&D unless it is an integrated part of an R&D project.

What do we mean by intramural and acquisition costs for R&D?

- **Intramural R&D:** R&D done by own personnel of the enterprise or contracted personnel. R&D-activity shall be counted irrespective of whether the work is done in the enterprise's R&D department or not. R&D performed on behalf of others, or R&D included as part of deliveries to customers, shall be included as intramural R&D. Work done by the R&D department but with no R&D character shall not be counted.
 - Compensation of employees includes wages, payroll tax, fees and other contributions. Do not use approved hourly rates from "SkatteFUNN". Compensation to employees shall be proportional to the R&D-personals man-years.
 - Costs of contracted personnel include costs to persons that are directly involved in your enterprises R&D project, but not employed in your enterprise. Acquisition of entire R&D projects exclusively done by others shall be reported as extramural R&D.
 - Other current costs include costs for materials, equipment, travel-, meeting- and course costs for own R&D personnel. Also the proportional use of rent-, lighting-, fuel- and administration costs. Write-offs are not to be included.
 - Investment costs is the acquisition, less sales last year, of durable business assets (except write-offs) that are used in the R&D-activity, both capitalized and direct costs. Durable business assets are plants, buildings, means of transport, machines, inventory, instruments and equipment with usage over one year. Also the proportional share of durable business assets for R&D. Write-offs shall not be included.
- **Acquisition for R&D-services:** Includes tasks done by other units that are not integrated in the enterprise's own R&D activity. External persons that deliver R&D services are therefore *not* considered contracted personnel. Acquisition of R&D services could for example be outsourced R&D. Deductible VAT shall not be included.