DANMARKS STATISTIK

# Development activities in enterprises 2023

**CVR-number:** _____

Other CVR-numbers covered by the response:

## Does the response cover more cvr-numbers?

No, only the one cvr-number ☐
Yes, more cvr-numbers ☐

Which other cvr-numbers are covered:

| CVR-number | Name of the enterprise |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

## 2. The enterprises Research and Decelopement – R&D

Research and Development (R&D) comprises creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge. For an activity to be an R&D activity, it must satisfy five core criteria.

Research and scientific development are identified on the basis of the following five criteria:

- Novelty: The goal of an R&D activity is to gain new knowledge
- Creative: R&D is creative work. This means that it's based on new concepts and / or hypotheses, and thus not routine procedures such as updates and maintenance of software.
- Uncertain: The results of the R&D work are not known from the beginning
- Systematic work: R&D projects are carried out in a systematic and planned manner
- Reproducible: An R&D activity can in principle be repeated by other researchers who want to achieve the same result.

## Has the enterprise in 2023 …:

2.1 carried out R&D activities in Denmark?
Yes ☐ No ☐

2.2 had a research- or development department?
Yes ☐ No ☐

2.3 purchased R&D from others (including from other enterprises in the same enterprise group)
Yes ☐ No ☐

2.4 sold R&D to others (including to other enterprises in the same enterprise group not included in this reporting)
Yes ☐ No ☐

2.5 possessed intellectual property rights (IPR) developed by the enterprise or purchased/licensed from others?
Yes ☐ No ☐

2.6 applied for patents?
Yes ☐ No ☐

2.7 used IPR owned by a parent company?
Yes ☐ No ☐

2.8 had expenses for innovation exclusive of R&D?
E.g., salary and other current cost for innovation excluding R&D. Purchase of equipment and software used in innovation activities and purchase of IPR etc.
Yes ☐ No ☐

If No to all questions 2.1-2.8 go to end of questionnaire

## 3. R&D personnel and full-time equivalents 2023

**How many of the enterprises' personnel have carried out, supported or administered R&D in Denmark in 2023?**

| | Number of persons with R&D activities in 2023 | Calculated number of full-time equivalents in 2023 |
|---|---|---|
| Researchers and other specialists | _____ | _____ |
| --- of which females | _____ | _____ |
| Other personnel, including technicians | _____ | _____ |
| --- of which females | _____ | _____ |
| Total personnel with R&D activities | _____ | _____ |
| --- of which females | _____ | _____ |

**How many external personnel have carried out, supported or administered R&D in Denmark in 2023?**

| | Number of external persons with R&D activities in 2023 | Calculated number of external full-time equivalents in 2023 |
|---|---|---|
| External researchers and other specialists | _____ | _____ |
| --- of which females | _____ | _____ |
| Other external personnel, including technicians | _____ | _____ |
| --- of which females | _____ | _____ |
| Total external personnel with R&D activities | _____ | _____ |
| --- of which females | _____ | _____ |

## Does the enterprise employ researchers with R&D activities, who have a Ph.D., licentiate- or doctorate degree?

Yes ☐ No ☐

If Yes:

| | Number of persons with R&D activities in 2023 | Calculated number of full-time equivalents in 2023 |
|---|---|---|
| Number of persons and calculated number of full-time equivalents for researchers, who have a Ph.D. , licentiate or doctorate degree | _____ | _____ |
| - Of which females | _____ | _____ |

## 4. Expenses for Research and Development in Denmark 2023

| | In 1.000 DKK |
|---|---|
| Labour costs (internal personnel) | _____ |
| External personnel costs | _____ |
| Other current costs | _____ |
| *Total current costs* | _____ |
| Capital expenditure on buildings for R&D | _____ |

| | |
|---|---|
| Expenditure on equipment specifically for R&D | _____ |
| *Total capital costs* | _____ |
| **Total expenses for In-house R&D** | _____ |

## 5. Current expenditures for Innovation 2023 excluding R&D

| | In 1.000 DKK |
|---|---|
| Labour costs for innovation | _____ |
| Other current costs for innovation | _____ |
| Total Current expenditure for innovation | _____ |
| **Acquisition of machinery, equipment, software & buildings (Exclude expenditures on these items that are for R&D)** | _____ |

**Other expenditures for innovation activities excluding R&D 2023**

| | In 1.000 DKK |
|---|---|
| Purchase of external rights (registered trademarks, design, patents or utility models purchased or licensed in in order to make new products) | _____ |
| Acquisition of other external knowledge, e. g. non-patentet inventions, knowhow etc. | _____ |
| Consultancy services, e.g. market surveys | _____ |
| Total expenditures on innovation activities | _____ |

## 6. Total expenditure on R&D and innovation 2023

| | In 1.000 DKK |
|---|---|
| Total expenditures | _____ |
| Budget for R&D expenses 2024 | _____ |

## 7. Please distribute current costs 2023 for in-house R&D on the following R&D types:

| | In per cent |
|---|---|
| **Basic research** (experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.) | _____ % |

| | |
|---|---|
| **Applied research** (also original investigation undertaken in order to acquire new knowledge. It is however, directed primarily towards a specific practical aim or objective. ) | _____ % |
| **Experimental development** (systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed. R&D covers both formal R&D in R&D units and informal or occasional R&D in other units.) | _____ % |
| Total (Have to be) | 100 % |

## 8. Financing of in-house R&D

| | In 1.000 DKK |
|---|---|
| **Enterprises' own financing** | _____ |
| **Financing via other Danish sources** | |
| - Other Danish enterprises within same enterprise group | _____ |
| - Other Danish enterprises | _____ |
| - Private Danish organizations and funds | _____ |
| - Ministry of Higher Education and Science | _____ |
| - Other government institutions | _____ |
| - Regions and municipalities | _____ |
| - Vækstfonden | _____ |
| **Financing via sources outside Denmark** | |
| - Foreign enterprises within same enterprise group | _____ |
| - Other foreign enterprises | _____ |
| - Private foreign organizations and funds | _____ |
| - EU | _____ |
| - Other public foreign financing | _____ |
| **Total (corresponding to the total in question 5)** | _____ |

(The sum will be estimated automatically in online questionnaire)

## 9. Expenses for in-house R&D in 2023 distributed by research areas

### 9.1 Expenses for in-house R&D distributed by research areas

| | In per cent |
|---|---|
| **Natural sciences:** | |
| Computer science | _____ % |
| Chemicals | _____ % |
| Biochemistry | _____ % |
| Other natural sciences | _____ % |
| **Technical sciences:** | |
| Building, construction, transport | _____ % |
| Electronics, electro technics and communication | _____ % |
| Machine construction, production technics | _____ % |
| Chemistry technics | _____ % |
| Materials | _____ % |
| Medico technology | _____ % |
| Energy technology | _____ % |
| Environmental technology | _____ % |
| Biotechnology related to energy and environment | _____ % |
| Industrial biotechnology | _____ % |
| Nanotechnology | _____ % |
| Other technology sciences | _____ % |
| **Health related sciences:** | |
| Pharmacy, pharmacology | _____ % |
| Medical biotechnology | _____ % |
| Other health related sciences | _____ % |
| **Other research areas:** | |
| Agricultural and veterinary sciences, total: | _____ % |
| Social sciences, total: | _____ % |
| Humanities, total: | _____ % |
| R&D in research areas total (Have to be) | 100 % |

### 9.2 Expenses for in-house R&D distributed by interdisciplinary research areas

Expenses are to be reported in percentages. The sum may be bigger or smaller than 100 or 0.

| | In per cent |
|---|---|
| Genetic engineering | _____ % |
| Food technologies | _____ % |
| Defense technology | _____ % |
| Software integrated in other products | _____ % |
| Software as independent products | _____ % |
| Hardware | _____ % |
| Robots and drone technology | _____ % |

## 10. Expenses for in-house R&D and innovation distributed by strategic research areas in 2023

The issue includes research, development and innovation related to some strategic research areas. The purpose of the questions is to make R&D efforts visible areas of strategic interest. If the activity can be attributed to some of the strategic research areas, an estimate is given here of the expenses that can be attributed to each area.

Expenses are to be reported in percentages. The sum may be bigger or smaller than 100 or 0.

**Cancer**
The topic includes research, development and innovation in the fields of the understanding of cancer, cancer prevention, the early detection of cancer, cancer diagnosis and treatment as well as the quality of life of cancer patients and cancer survivors.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Democracy research**
The topic includes research, development and innovation regarding the democratic form of government. It can e.g. include research, development or innovation that studies the institutions and processes of democracy, such as the relationship between the institutions of democracy, the role of political parties, the democratic decision-making process, the role of the administration, the relationship between the different political levels locally, nationally and internationally as well as the relationship between economic and political power. It can also include the importance of the development of technology and the media for the democratic processes, and research that study the democratic community, civil society and the relationship between the population and those in power. Additionally, it can include the development of and transition to democracy and rule of law in non-democratic countries.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Gender and identity research**
The topic includes research, development and innovation within the understanding of gender and identity as well as the understanding of the meaning of gender and identity in and for society – including the technological development. It can e.g. include research, development or innovation that studies gender and identity in relation to discrimination, equality, democracy, education, the labor market, health, criminal law etc. It can also include research, development or innovation that studies gender-related biological factors in relation to drug development and diagnoses or that study the importance of gender and identity for e.g. development and use of digital solutions, transportation patterns etc.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Psychiatry**
The topic includes research, development and innovation in the field of mental illness and health including medical treatment, other forms of treatments such as psychological and psychotherapeutic treatment, risk factors, prevention, rehabilitation and effects of psychiatric initiatives. It also includes basic scientific research relevant to the field of psychiatry, e.g. within brain research and molecular and cell biology.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Food safety**
The topic includes research, development and innovation with the purpose of avoiding pathogenic bacteria and undesired residuals in food including food related microbiology, biochemistry, risk control, quality of raw food materials, health, production processes, taste, smell, preservation of food, biotechnology, hygiene, antibiotic resistance, novel foods, ingredients, additives, polluting substances, pesticide remnants, herbicide remnants, GMO, foodborne diseases, feed, packaging and traceability.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Polar research**
The topic includes research, development and innovation performed on the basis of material and data from the polar regions (the Arctic and Antarctica) that treats topics and issues related to the polar regions or has the aim to be applied directly in the polar areas.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Pandemic preparedness and response**
The topic includes research, development and innovation in the fields of pandemic preparedness and response (including in a One Health approach) – e.g. surveillance and monitoring, development of countermeasures, production technologies, risk assessment and evidence for public health initiatives. The topic also includes the social and socio-economic aspects of pandemic preparedness and response that can inform policy development.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Covid-19**
The topic includes costs for research and development activities related to covid-19. It could be in vaccine research or other health research. It can also be research within social relations, preparedness, communication, etc.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

## 11. Green research, development and innovation 2023

Green research, development and innovation contribute to the green transition of society - specific solutions and technologies as well as basic knowledge.

Green research and development is categorised in seven sub-topics:

1. Sustainable energy technologies and production etc.
2. Energy efficiency
3. Sustainable food production, agriculture and forests
4. Climate friendly transportation
5. Environmental protection, circular economy and environmental technology
6. Nature conservation, biodiversity and climate change
7. Sustainable behaviour and societal consequences

Distribute expenses for own R&D and innovation within the green sector as a percentage by theme.
NOTE: The total have to be 100%

**Sustainable energy technologies and production etc**
The topic includes research, development and innovation in the field of sustainable energy research with focus on development of green technology and production of sustainable and renewable energy e.g. solar energy, wind power, hydropower, bioenergy, geothermal energy as well as carbon capture and storage (CCS)/utilisation (CCUS). The topic also includes storage and conversion technologies such as Power-to-X, Power-to-Gas and fuel cells as well as energy planning and regulation.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Energy efficiency**
The topic includes research, development and innovation in the field of energy efficient construction, infrastructure and building renovation, sustainable building materials and improvements of energy efficiency in existing buildings, cities and industry. The topic also include optimisation of production processes and systems, sustainable and intelligent/smart grid and integrated energy systems, district heating and cooling, refrigeration and heating systems as well as thermostats, heat pumps, ventilation, lighting and technical installations. Finally, the topic includes energy planning and regulation.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Sustainable food production, agriculture and forests**
The topic includes research, development and innovation in the field of green and sustainable production systems, methods, technologies and solutions within agriculture, food, soils, forests, fishery and aquatic production including research in emissions, capture, sequestration, storage, uptake and cycle of nutrients, $CO_2$ and other greenhouse gasses in soils, forests and the aquatic environment. The topic also includes climate friendly as well as more environmentally and nature friendly production systems and management along with climate adaption of production, products and land use. Furthermore, the topic includes research in new and alternative protein sources plus novel foods and other bio-based products

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Climate friendly transportation**
The topic includes research, development and innovation in the field of climate friendly transportation and logistics of both cargo and individuals on water, on land and in the air as well as optimising transport capacity, infrastructure and planning. The topic also includes research in sustainable fuels for individual and cargo transportation including electrification, hybrid, electrofuels (Power-to-X) and biofuels with a focus on transition of heavy transport, international shipping and aviation. Furthermore, the topic includes research in facilitating behavioural changes towards more climate friendly transportation.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Environmental protection, circular economy and environmental technology.**
The topic includes research, development and innovation with the purpose of avoiding pathogenic bacteria and undesired residuals in food including food related microbiology, biochemistry, risk control, quality of raw food materials, health, production processes, taste, smell, preservation of food, biotechnology, hygiene, antibiotic resistance, novel foods, ingredients, additives, polluting substances, pesticide remnants, herbicide remnants, GMO, foodborne diseases, feed, packaging and traceability.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Nature conservation, biodiversity and climate change**
The topic includes research, development and innovation in the field of circular economy and recycling of waste including e.g. plastic, textiles and polymers. The topic also includes research in environmental protection and pollution of air, soil and water with focus on minimising the emission of polluting materials and substances in addition to the development of new technological solutions to improve the air, soil and aquatic environment. Furthermore, the topic includes sustainable water resources and technologies to ensure the protection of groundwater and drinking water, improved water supply, water cleaning and utilisation of wastewater as well as a clean water environment in both groundwater, surface water and the seas. Finally, it includes climate adaptation of cities, coastal and land areas.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Sustainable behaviour and societal consequences**
The topic includes research, development and innovation in the field of conservation, restoration and management of nature and biodiversity, ecosystem services and understanding of ecosystems with focus on processes, dynamics, functions and structures. The topic also includes research in impact of and adaptation to climate change on nature and biodiversity as well as further development of cli-mate models and monitoring e.g. with focus on development in sea levels and melting of sea ice, glaciers and the polar ice caps.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

## 12. Digitalisation 2023

The topic includes research, development and innovation that contributes to the digitalisation of society - specific solutions and technologies as well as basic knowledge. It applies to research, development and innovation of digital technologies and solutions, application of digital solutions, societal consequences – both positive and negative, cybersecurity and information security, robot and drone technology, artificial intelligence, big data and quantum research.

Research, development and innovation in digitalisation is categorised in five sub topics:

1. Cybersecurity and information security
2. Robot and drone technology
3. Artificial intelligence and Big Data
4. Quantum research
5. Other digitalisation research

**Cybersecurity and information security**
The topic includes research, development and innovation in the field of technologies for protection of confidential data sources and for defence against cyber-attacks on data or systems.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Robot and drone technology**
The topic includes research, development and innovation in the field of robots and drones – e.g. design, construction, operation and use of robots. It includes both mechanical units and software for these. Research, development and innovation of robots consisting strictly of software (such as virtual assistants and chatbots) is not included.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Artificial intelligence and Big Data**
The topic includes includes research, development and innovation in the field of artificial intelligence/machine learning, where systems based on algorithms analyse patterns i.a. with regard to control, prediction and supervision. Additionally, the topic includes includes research, development and innovation in the field of Big Data such as data management, data processing, data analysis and data quality control, interoperability, verification etc.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Quantum research**
The topic includes e.g. natural sciences and technical sciences researc, development and innovation in fields such as quantum computing, quantum programming, quantum simulation, quantum communication, quantum encryption, quantum sensing/quantum sensors, quantum photonics, quantum meteorology, quantum technology, quantum physics, quantum chemistry, quantum materials and quantum systems.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

**Other digitalisation research**
The topic includes research, development and innovation in the field of digital research/digital technology that is not included in the above four topics, e.g. network technologies and architectures, cloud computing, micro-/nanoelectronics, augmented/virtual/mixed reality, digital twins, interactions between people and digital technology, societal implications of digitalisation etc.

| **Own R&D** | | **Innovation** | |
|---|---|---|---|
| | % | | % |

## 13. Expenses for external R&D in 2023

Distribute expenses for R&D purchased in Denmark and other countries by:

In 1.000 DKK

**Enterprises within the same enterprise group**

- In Denmark _____
- In other countries _____

**R&D purchase in Denmark from**

- Other enterprises _____
- Consultants _____
- Advanced Technology Groups (GTS), (Alexandra Instituttet Bioneer, DBI (Dansk Brand- og sikringsteknisk Institut), DELTA (Dansk Elektronik, Lys & Akustik), DFM (Danmarks Nationale Metrologiinstitut), DHI (Institut for vand og miljø), Force Technology, Teknologisk Institut) _____
- Universities and other institutions of higher education _____
- Other public research institutions _____
- Other _____

**R&D purchase in other countries**

- Other enterprises _____
- Consultants _____
- Other _____

**Total expenditures on purchase of R&D** _____

In 1.000 DKK

**Budget for purchase of R&D in 2024** _____

## 14. Financing of purchase of external R&D 2023

In 1.000 DKK

| | |
|---|---|
| **Enterprises' own financing** | _____ |
| **Financing of purchased R&D from other Danish sources** | _____ |
| - Other Danish enterprises within same enterprise group | _____ |
| - Other Danish enterprises | _____ |
| - Private Danish organizations and funds | _____ |
| - Ministry of Higher Education and Science | _____ |
| - Other government institutions | _____ |
| - Regions and municipalities | _____ |
| - Vækstfonden | _____ |
| **Financing of purchased R&D by sources outside Denmark** | |
| - Foreign enterprises within same enterprise group | _____ |
| - Other foreign enterprises | _____ |
| - Private foreign organizations and funds | _____ |
| - EU | _____ |
| - Other public foreign financing | _____ |
| - Total (corresponding to the total in question 8) | _____ |

## 15. Business finance

**During the three years from 2021 to 2023, did your enterprise try to obtain the following types of funding?**

| | Try to obtain funding | | | If your enterprise obtained funding, was this partly or fully used for R&D or other innovation activities? | |
|---|---|---|---|---|---|
| | *Yes, successfully obtained some funding of this type* | *Tried, but not successful* | *No* | *Yes* | *No* |
| **Equity finance** (finance provided in exchange for a share in the ownership of the enterprise) | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Debt finance** (finance that the enterprise must repay) | ☐ | ☐ | ☐ | ☐ | ☐ |

**During the three years from 2021 to 2023, did your enterprise receive any public financial support from the following levels of government?**

Include financial support via grants, subsidised loans, and loan guarantees. Exclude revenues from public sector* procurement contracts.

| | | | If your enterprise received financial support: was part of this used for R&D or other innovation activities? | |
|---|---|---|---|---|
| | Yes | No | Yes | No |
| Local or regional authorities* | ☐ | ☐ | ☐ | ☐ |
| National government* | ☐ | ☐ | ☐ | ☐ |
| EU Programme for Research and Innovation (Horizon 2020, Horizon Europe) | ☐ | ☐ | ☐ | ☐ |
| Other financial support from a European Union institution* | ☐ | ☐ | ☐ | ☐ |

* Include financial support via grants, subsidised loans, and loan guarantees. Exclude financing of activities under contract by the public sector*. The public sector includes government owned organisations such as local, regional and national administrations and agencies, schools, hospitals, and government providers of services such as security, transport, housing, energy, etc.

## 16. Sale of R&D services

**Distribute sale of R&D in Denmark and other countries in 2023 by:**

In 1.000 DKK

- Enterprises within the same enterprise group _____
- Other enterprises, incl. consultants _____
- Universities, institutions of higher education _____
- Other _____
- Total _____

**Expected sale of R&D in Denmark and other countries in 2024**

In 1.000 DKK

Budget for sale of R&D in 2024 _____

**Questionnaire filled in by:**

**Name:** _____

**Telephone number:**_____

**e-mail:** _____