SDU CO_2 account

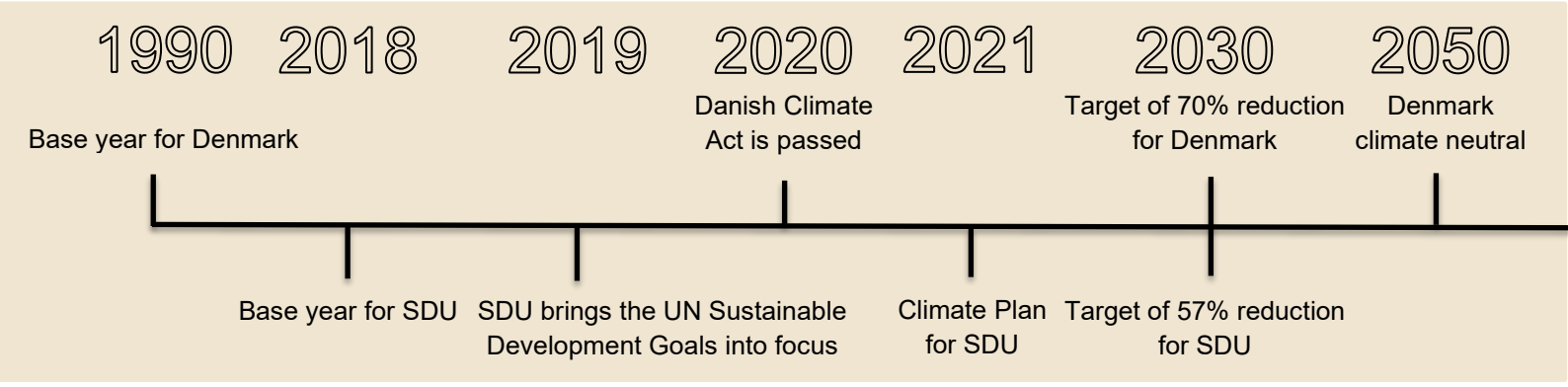
2018-2022

Contents

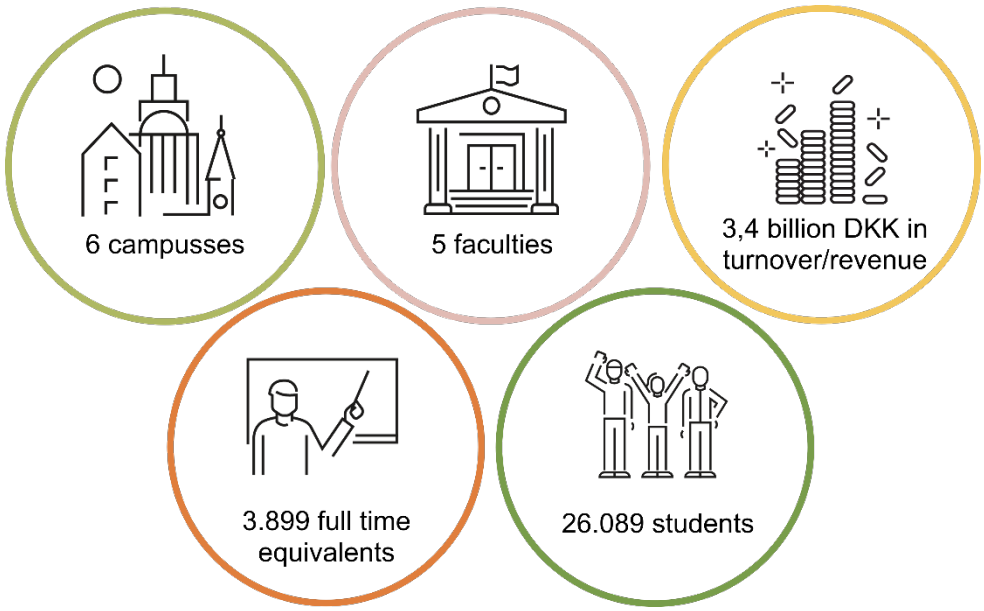
01 Introduction

Climate change is a significant complex societal challenge that SDU must and will address. Sustainable changes and solutions require new - and often interdisciplinary - research-based knowledge, and SDU is an indispensable actor in the transition process.

As an educational and research institution with 26,000 students and employing 3,900 staff (full-time equivalents) across six campuses, SDU also aims to reduce the university's own greenhouse gas emissions in line with what research deems necessary.



In 2020, the Danish Parliament passed the Danish Climate Act. The purpose of the Act is for Denmark to reduce greenhouse gas emissions by 70% by 2030 compared with 1990 levels. SDU has therefore set a preliminary target to reduce the University's CO_2e emissions by 57% in 2030 compared to 2018, which corresponds to a 70% reduction compared with 1990. This was adopted in 2021 and is set out in SDU's 2030 Climate Plan.



01.01 Purpose

The purpose of SDU's climate account is to provide information about where SDU stands as a university today in relation to CO_2e emissions. The climate account should therefore be seen as a tool to focus attention on the areas about which the University should be particularly aware and the University, along with its employees and students, can make an effort and a difference. In this way, the account helps set the direction for SDU in the work to reduce the University's total CO_2e emissions and reach the target of 57% by 2030.

Targets for the climate account:

The climate account contains the sources and requirements for the calculations as well as a development plan for drawing up the report, so there is a clear plan for the natural development of the scope of the account as more data becomes available. In this way, when new initiatives are included it will be possible to make comparisons with previous years.

The climate account is developed with input from administration, researchers, students, other universities and collaboration partners. To achieve the targets, SDU wants to involve employees and students by creating a dialogue on the topic. The aim is to get as many people as possible involved so that SDU can take action to reduce CO_2e.

SDU's climate account cannot necessarily be compared directly with the climate accounts of other universities, organisations and companies, as new data sources and new methods for CO_2e calculations are constantly emerging. SDU aims actively to use the account to set the direction for the university's reduction targets based on factual and measurable data and to ensure transparency in the baseline and progress in the work on reducing the total CO_2e emissions.

01.02 Method

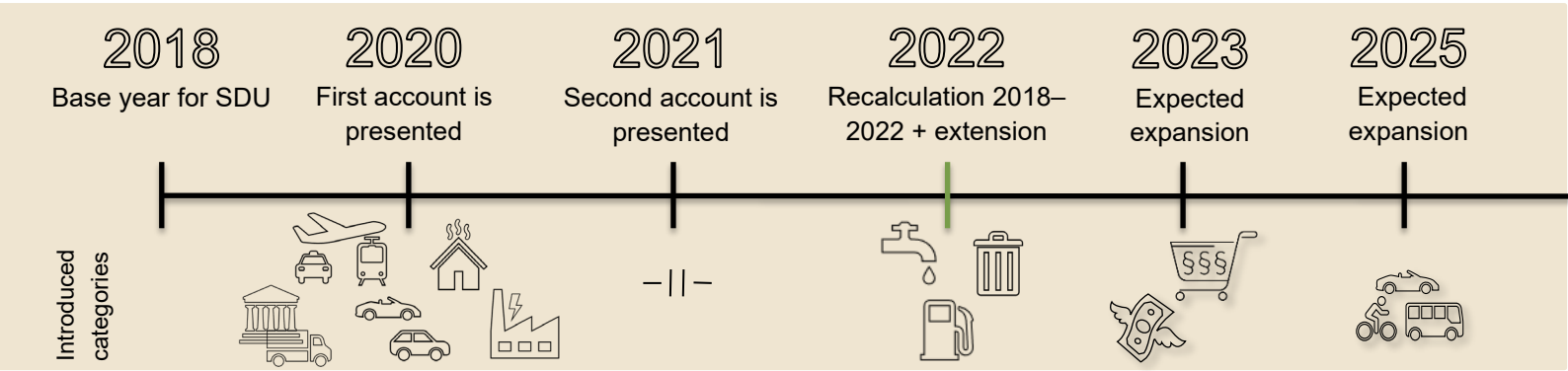
Sustainability and climate reporting is not yet a requirement, and there are no common guidelines. However, from 2024 it will be a requirement for large and medium-sized companies to report on environmental, social, and corporate governance data (ESG). Thus, there is development in this area.

The calculation of CO_2e emissions is based on the Greenhouse Gas Protocol (GHG Protocol).
The GHG Protocol is an internationally recognised and widely used standard for calculating CO_2e emissions for companies and organisations and is recommended, among others, by the European Commission and the cross-sectoral collaboration within the Government's climate partnerships.

The GHG Protocol works with three scopes for the calculation of CO_2e emissions.

Scope	Type of emissions	Definition
Scope 1	Direct emissions	All direct emissions from sources owned or controlled by SDU, including cars and other vehicles as well as emissions from SDU's own activities such as gases used for research and education.
Scope 2	Indirect emissions	Indirect emissions from electricity or district heating consumed by SDU.
Scope 3	Other indirect emissions	Other indirect emissions from SDU's activities that arise from sources that SDU does not own or control. This includes emissions related to the entire value chain – both 'upstream', including emissions from procurement, and 'downstream', which are emissions associated with the use and disposal of products.

In relation to the GHG Protocol, companies and organisations are required to report on scope 1 and scope 2. This concerns the direct emissions and indirect emissions related to the operation of buildings. For SDU, this applies to electricity and heating.
Reporting on scope 3, on the other hand, is voluntary. Scope 3 contains 15 categories of emissions that the company can report on where possible. SDU will continuously expand the number of categories in scope 3 as data for the categories become available and can be incorporated into the climate account.



02 Results 2022

10,707
tonnes of CO_2e

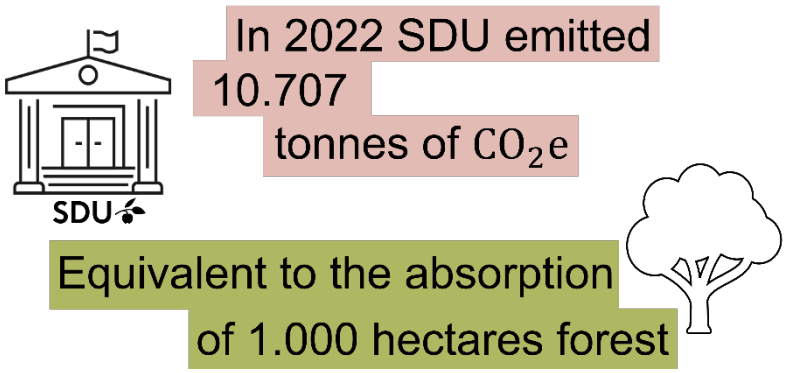
2.7
tonnes CO_2e per FTE
(full-time equivalent)

33
kg of CO_2e per m^2

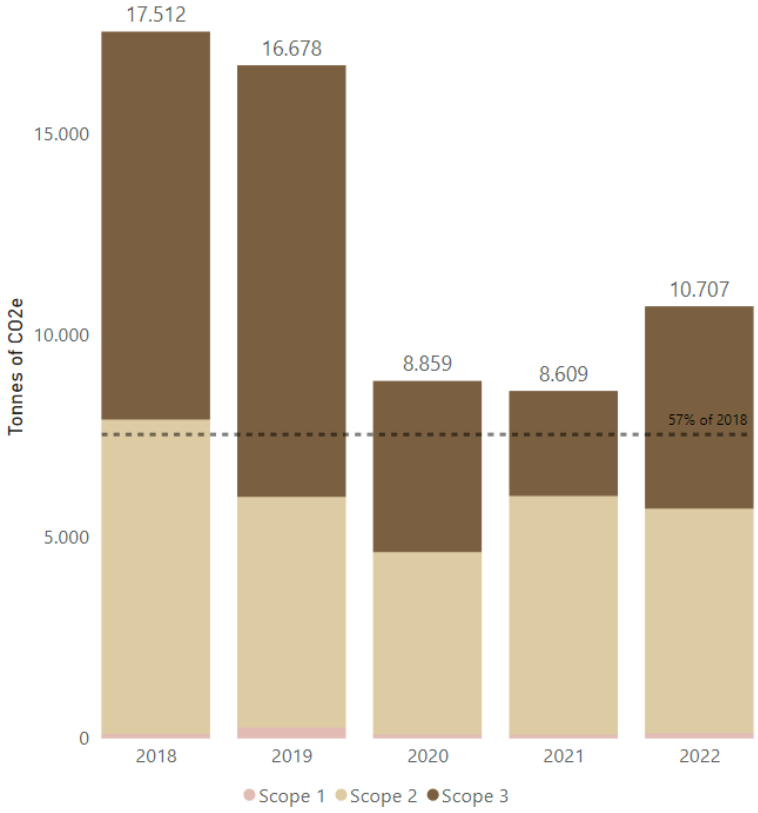
-39%
since 2018

In 2022, SDU emitted 10,707 tonnes CO_2e, which is 39% lower than the emission in 2018.

However, there is an increase compared to 2020 and 2021, which were exceptionally low due to the Covid-19 lockdowns. SDU is far from returning to the high levels of 2018 and 2019 in 2022, which is a positive sign. However, this could be due to continued reduced activity at the beginning of 2022, especially in other countries than Denmark, and changed habits after Covid-19.



For dynamic and more detailed figures, please refer to SDUnet, where detailed reports are displayed, providing insights at faculty level.

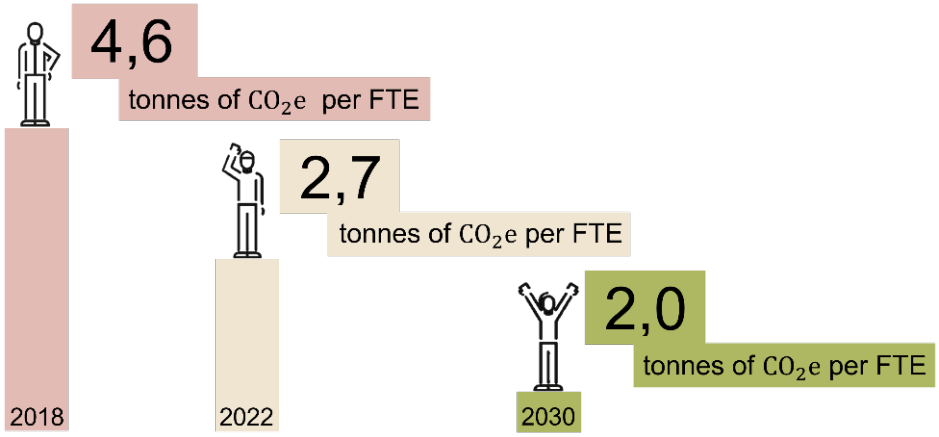


In 2022, scope 2 emissions were the highest. This varies over the years and is particularly evident in 2021, which is likely due to COVID-19. Here, scope 2 is by far the largest, and scope 3 represents a low quota. In contrast, 2018 and 2019 were dominated by scope 3 emissions.
The breakdown of the three scopes in 2022, shows that scope 1 accounts for 1%, scope 2 for 52% and scope 3 for 47%. The development of the three scopes will be elaborated in “Scope 1”, “Scope 2” and “Scope 3”.
Normally, scope 3 is expected to account for 80–90% of the emissions, but as SDU do not currently include all categories in scope 3, scope 2 is relatively larger in this year’s account. This indicates that SDU still needs to account for large items such as purchases and investments. This is described in more detail under ‘Development of climate account for SDU’.

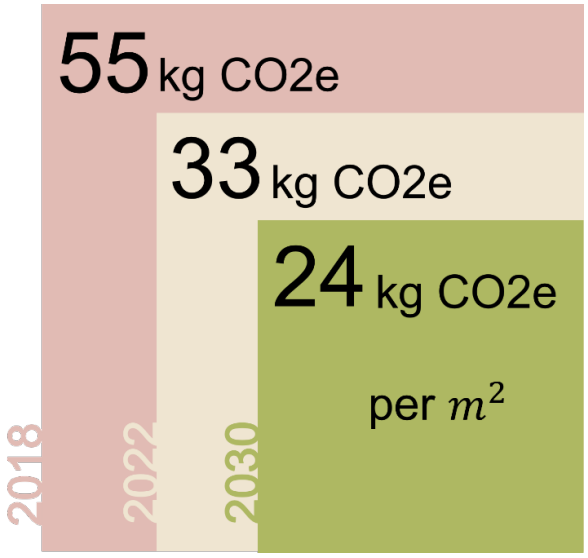
SDU is a university that is constantly evolving. This means that there is a fluctuating number of

staff and students, as well as a variation in the number of square metres to move around in and other activities influencing the emission.

The number of full-time equivalents (further noted as FTEs) has a clear impact on emissions at SDU, for example, in terms of power consumption, purchasing of goods and work-related travel.



CO_2e emissions calculated per FTE at SDU show the same trend as the overall result. In 2022, SDU's emissions correspond to 2.7 tonnes of CO_2e per FTE, whereas the result in the base year 2018 is significantly higher at 4.6 tonnes of CO_2e. This may be due to habits acquired because of SDU's climate efforts and during COVID-19. It can also be due to the levels of activity have not yet returned to their original levels.



The target of a 57% reduction by 2030 means that a full-time equivalent (FTE) should emit a maximum of 2 tonnes CO_2e in 2030, assuming SDU has the same number of FTEs in 2030.

Another factor that can affect emissions is the number of square metres in SDU's buildings. In 2022, SDU had a CO_2e emission per square metre of 32 kg. This is an improvement from the base year 2018, when emissions per square metre were 55 kg. This is a decrease of 42%. If the 57% target is applied to these figures, then emissions per square metre would need to be 24 kg by 2030. However, the target is set for total emissions.

The calculations per FTE and per square meter are based on total emissions. Not all categories relate directly to building operations or directly to a FTE. However, this information is important for understanding the extent of SDU's emissions.

Scope 1

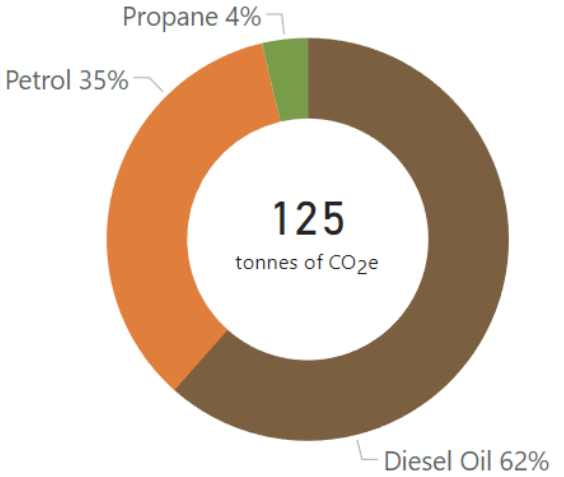
1%
of total emissions

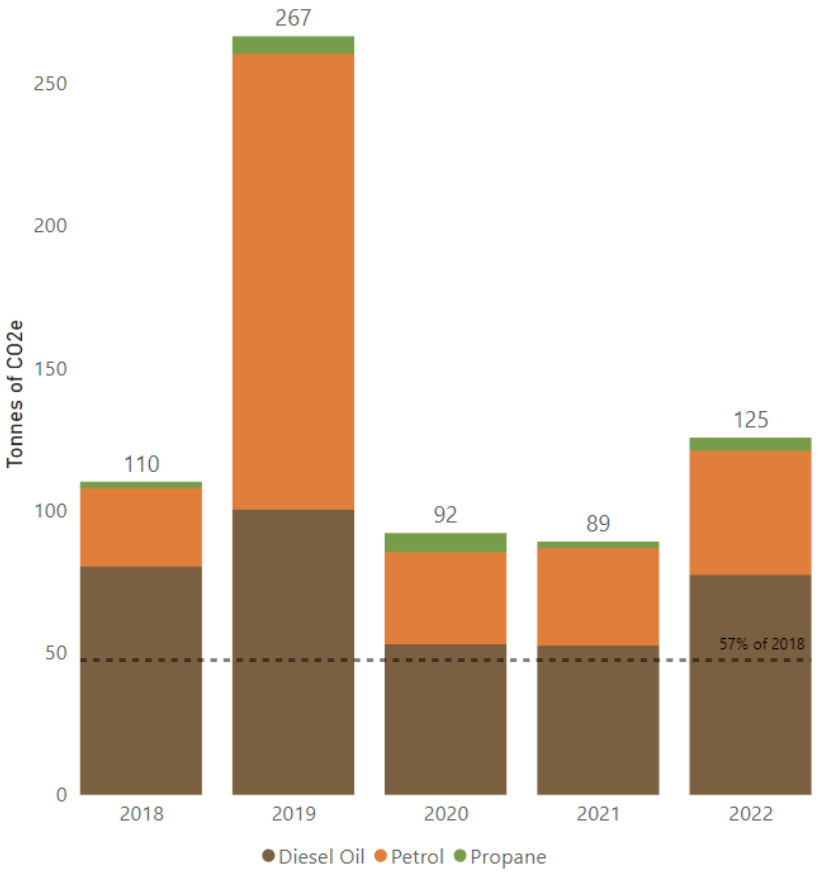
125
tonnes of CO_2e

14%
since 2018

Scope 1 of the GHG Protocol is the direct emissions from a company or organization. For SDU, t this includes the direct emissions from SDU's service vehicles and fossil gases from laboratories and workshops. In this context, data is typically based on procurement (invoices), where fuel purchases on fuel cards are often reported in units such as liters.

Scope 1 amounts to 1% of the total account in 2022. SDU thus emits 125 tonnes of CO_2e through driving SDU cars and consumption of propane. Fuel for SDU cars is the greatest source of emissions through petrol and diesel consumption. Here, diesel accounts for 62% of scope 1, with petrol accounting for 35%. Propane, on the other hand, amounts to only 4%.





Compared with 2018, SDU's scope 1 emissions have increased by 14%. SDU also see that this category fluctuates: for example, there was a high consumption of petrol in 2019 compared with other years.

The direct emissions from SDU are therefore small in the overall account, and measures such as converting SDU cars to electric cars will have a positive impact for scope 1. On the other hand, will this measure lead to higher emissions in scope 2. However, the overall impact of converting SDUs car fleet with electric cars, is evaluated to be small taking the size of the emission into account.

Scope 2

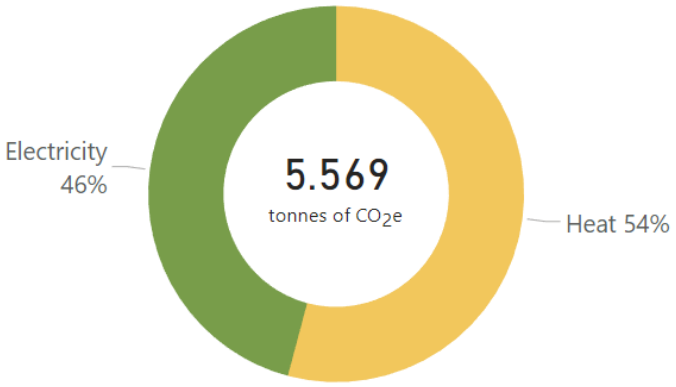
52%
of total emissions

5,569
tonnes of CO_2e

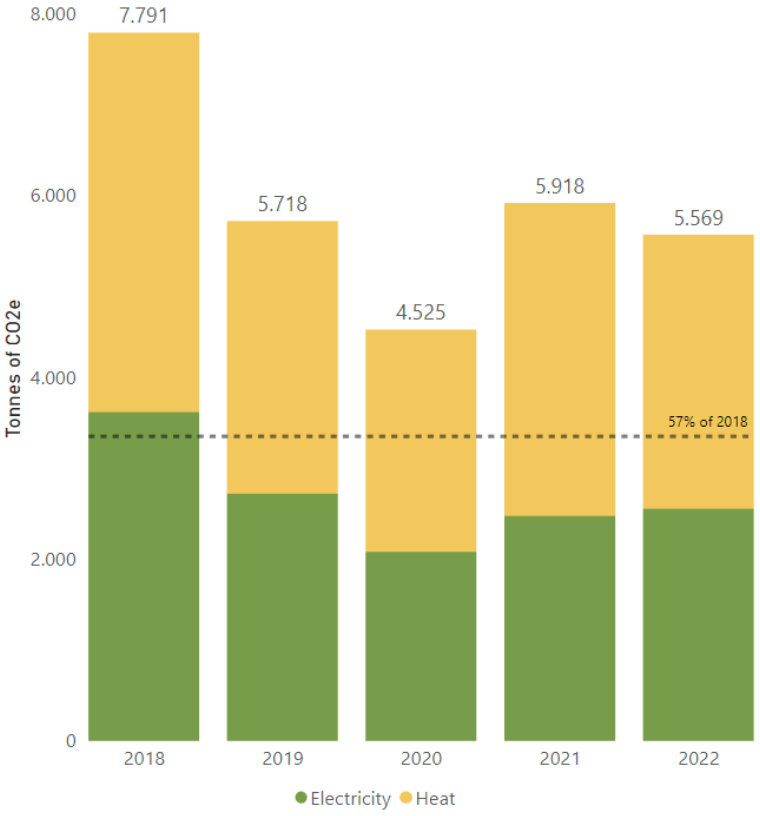
-29%
since 2018

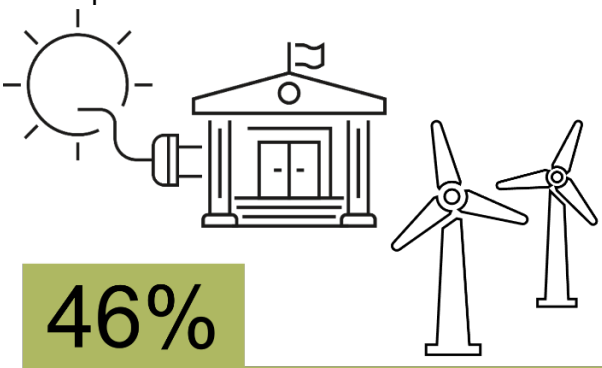
Scope 2 of the GHG Protocol is the indirect emission of CO_2e through energy consumption. For SDU, this concerns electricity and heat consumption.

Scope 2 for SDU is 5,569 tonnes of CO_2e, of which 2,554 tonnes are emissions from electricity, and the remaining 3,015 tonnes are emissions from district heating consumption.[1]



The share of renewable energy in Denmark is growing. It has increased by 12 percentage points from 2018 to 2022 and is 46% in 2022. This results in a decrease in emission factors in the same way it affects electricity spot prices. This development is of great importance in that the scope 2 emissions have decreased by 29% since 2018. In comparison the consumption in kWh (electricity) has increased by 3% and kEh (heat) has increased by by 5%. Resulting in an overall increase in energy consumption of 4%. Thus, consumption remains fairly constant over the years, while the emissions has decreased in that same period.



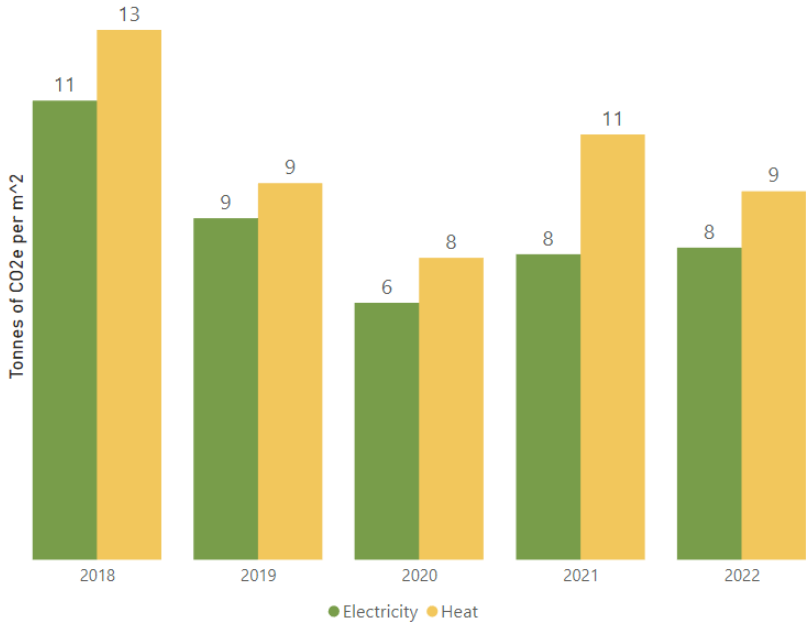


46%

comes from renewable energy

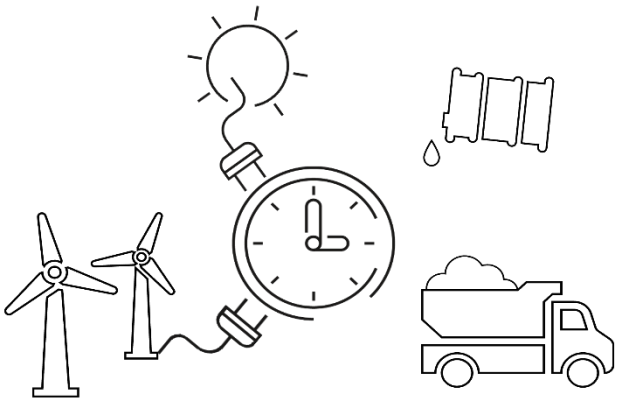
[1] The 125%-method is applied based on the emission factors from EnergiNet.

In the coming years, SDU is looking into commisioning new buildings, such as the new HEALTH building, while at the same time, several other leases are expected to be terminated. It is expected that an increase in the number of square meters will correspondingly increase energy consumption. To account for this, emissions per square meter for scope 2 are being considered. Emissions per square meter for energy were 24 kg in 2018, whereas in 2022, it is 17 kg per square meter. Therefore, a decrease is also seen in this area.



A more technical but significant factor for the potential decrease in scope 2 emission in the coming years is the improvement of the quality of the data from the supplier. Consumption can be determined on an hourly basis, for almost all SDUs locations in 2022. Hourly-based determinations enable the clarification of production forms for, for example, electricity. Which can have a significant impact of the calculations of the emissions. This category has progressed significantly from 2018 to 2022, where more data is available on an hourly basis from Energinet.dk.

There are three options for lowering emissions from power consumption. One is to consume less, including reducing standby time. Another is to use electricity when emissions are lowest, i.e. times when the proportion of renewable energy is high or consumption in Denmark is low. Therefore, some activities could be moved so that power is used at the smartest time. A third option is to use more renewable energy, for example, by installing more solar panels.



Optimization of timing for electricity usage

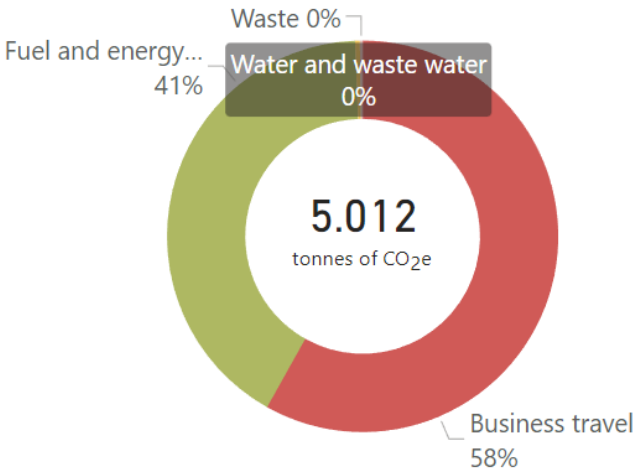
Scope 3

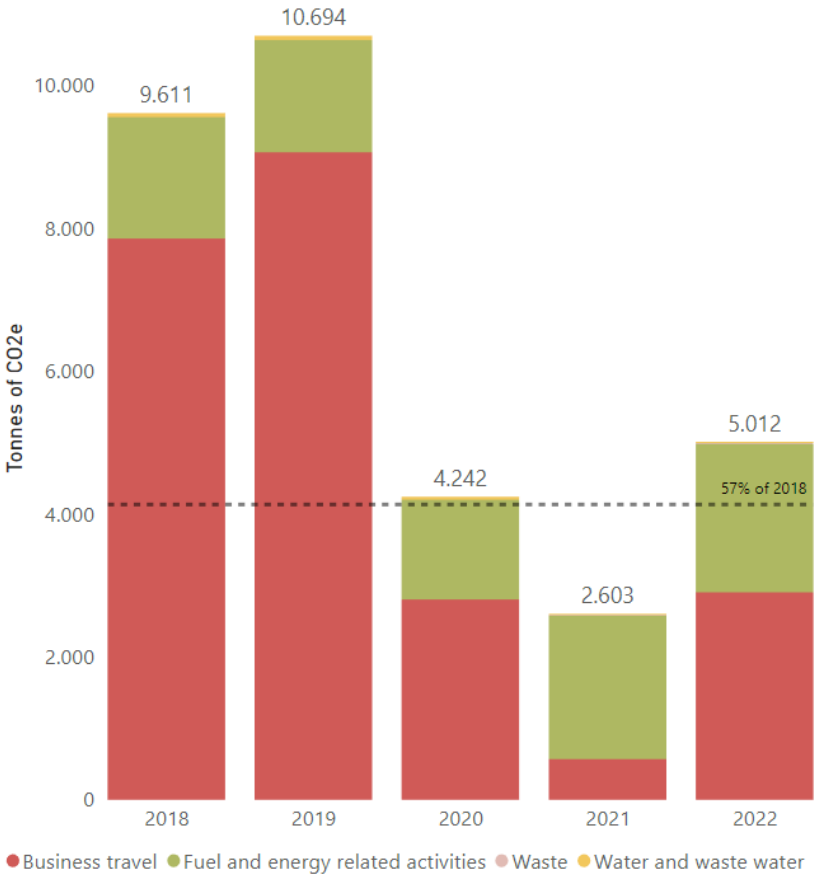
46%
of total emissions

5,012
tonnes of CO_2e

-48%
since 2018

Scope 3 covers the categories in which SDU indirectly affects an emission. This means that the emission itself takes place elsewhere than at SDU. For SDU, indirect emissions are calculated for waste, water, work-related travel as well as fuel and electricity-related activities. In the GHG Protocol, scope 3 covers several categories that SDU are working to include. Read more about this in 'Development of the climate account for SDU'. In this account, scope 3 has a total emission of 5,012 tonnes of CO_2e, corresponding to 46% of SDU's total emissions.

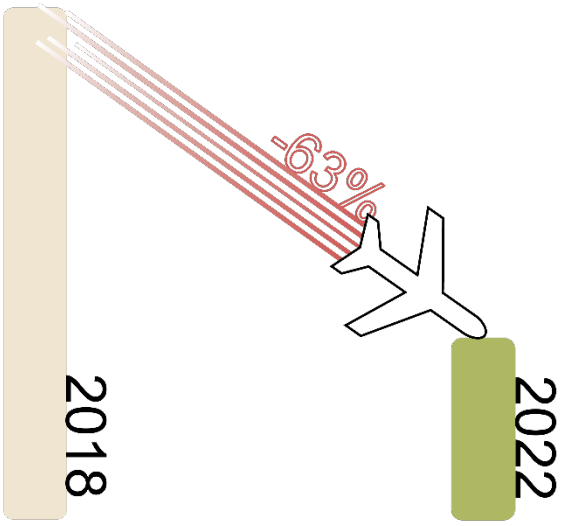


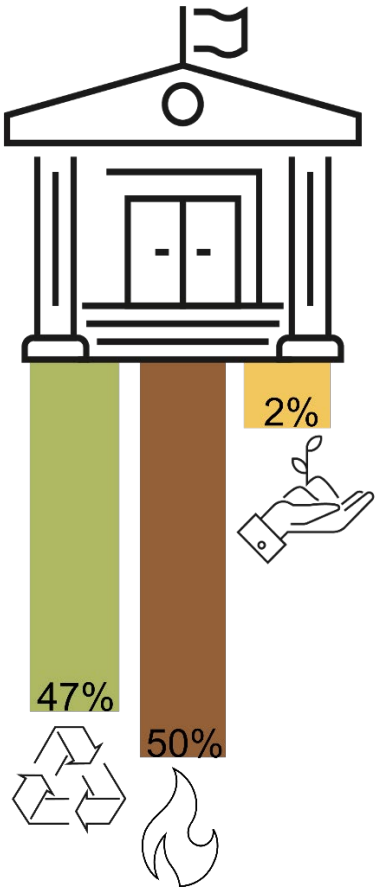


The largest category is work-related travel, where emissions from air travel in particular dominate. This category accounts for 58% of scope 3, corresponding to 2,903 tonnes of CO_2e. Another significant category is fuel and energy-related activities not included in scope 1 and 2. This accounts for 41% of scope 3. The emissions from waste and water comprises for less than 1% of scope 3.

In comparison with 2018, emissions from scope 3 have decreased by 48%. This is primarily due to business travel, which has decreased by 63%, as a result of Covid-19 lockdowns, which made travelling impossible. Overall, the activity on SDU was minimal in 2020 and 2021, which also reflects in a very low water consumption. The COVID-19 lockdowns have in general had a significant impact on the emissions of scope 3.

The work-related travel category covers air travel, driving own car, train, fuel expenses and taxis. In addition to transport itself, work-related travel also covers emissions related to the production and transport of fuel, called Well-to-Tank (WTT). It is clear that air travel is the largest source of work-related travel emissions at SDU. However, the number of work-related trips made by air has decreased since 2018, while the use of other modes of transport has increased. This may be due to COVID-19 and the resulting changes in habits. In 2023, a new travel policy has also been adopted, which SDU expects will help maintain some of the travel-related habits following COVID-19. Read more about the travel policy in the section 'Initiatives at SDU'.





Fuel and energy-related activities are connected to scope 1 and 2 emissions. That is, they are transmission and distribution losses from electricity and heat and emissions from the extraction and transport of fuel to filling station. These emissions therefore also follow fuel and energy consumption. Measures to reduce and minimise the emission from this category is therefor in scope 1 and 2.

CO_2e emissions from water consumption at SDU do not occupy much of scope 3, and emissions have decreased significantly since 2018. This may be due to COVID-19 and the subsequent lower activity or that water management has become more efficient in terms of CO_2e.

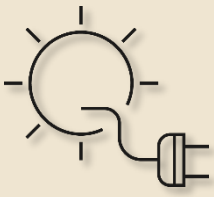
Waste management can result in the release of CO_2e. SDU has data from 2021 for the management of the waste SDU produces. 47% of waste at SDU is recycled, 50% is sent for incineration, 2% for other recovery and <1% is sent to landfill. For this calculation, SDU currently have data from the following campuses: Kolding, Copenhagen, Odense and Slagelse.
Recycling can save CO_2e emissions somewhere else in society because a new product is not produced. However, the GHG Protocol does not account for this in the three scopes. It is often referred to as 'scope 4' or 'credits'. Based on the GHG Protocol, SDU's account does not include a scope 4.
Read more under 'Initiatives' about waste and waste sorting at SDU.

03 Initiatives at SDU

Waste sorting so that more is recycled

Fewer flights, more online meetings

More sustainable laboratories



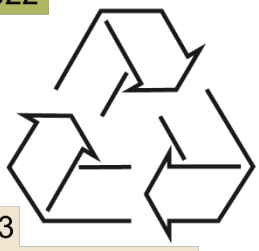
Energy

Fewer small deliveries and requirements for suppliers

SDUs work on reducing emissions from greenhouse gasses is collected in Climate Plan 2030. Climate accounting makes it possible to track only some of the initiatives. At present, it is not possible to see the effect of other initiatives. In the climate plan for SDU[2], some initiatives have also been adopted to achieve the 2030 target. These can be read here.

SDU saved the planet for 261 tonnes of CO_2e in 2022

By sorting and recycling waste



New waste sorting implementet in 2023

Expectation of higher savings

In Q1 2023, waste sorting was introduced on SDU's campuses. This means that employees and students now have to sort the waste they throw away. This means that more waste is being recycled, saving society 261 tonnes of CO_2e. However, this does not mean a saving for SDU in the account itself, only that waste sorting makes a difference. Furthermore, it can have an impact on waste management, where incineration is typically more costly in CO_2e than recycling.

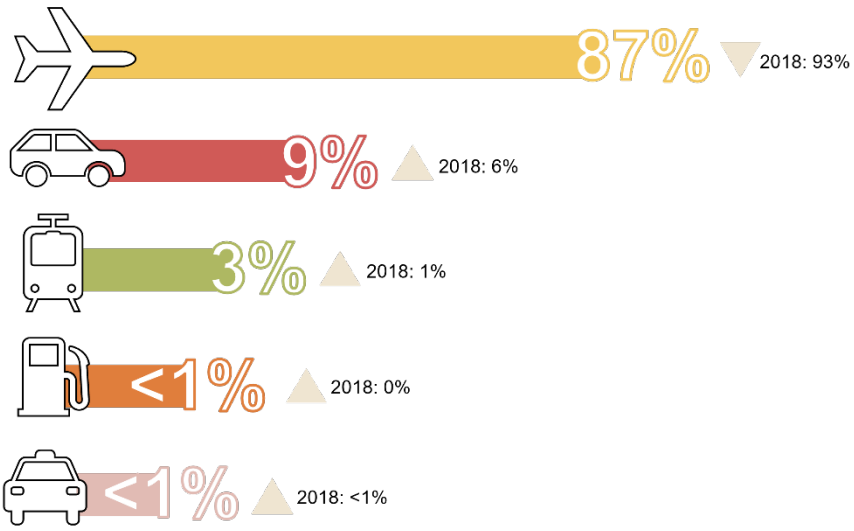
In addition, in Q1 2023 SDU acquired a plastic granulator. This comes from a project from SDU Green Lab. SDU Green Lab is working to certify and incorporate more sustainability into the laboratories. One of the focus areas has been the recycling of pure plastic from the laboratories. By granulating the plastic at SDU, transport to waste/recycling facilities can be saved, whereas previously it was sold on. Now, a buyer can instead collect the plastic directly from SDU.[3] SDU expect to measure the impact of the project in Q2 2024. SDU Green Labs is also working on other initiatives to make SDU's labs more sustainable, such as reducing power consumption, including idle power consumption. As a result, there is a strong focus on making laboratories as sustainable as possible.

In January 2023, SDU's new travel policy came into effect. The intention is to limit travelling to only what is necessary. As SDU is an educational and research institution, conferences or similar events can be highly relevant for acquiring the latest knowledge. When travelling is necessary, the policy encourages choosing a mode of transport other than air travel whenever possible. The travel policy guides employees in choosing the best option. It is a guideline, and you should always try to find transport based on the hierarchy of electric cars being the best, then public transport, petrol cars and finally flights. This is

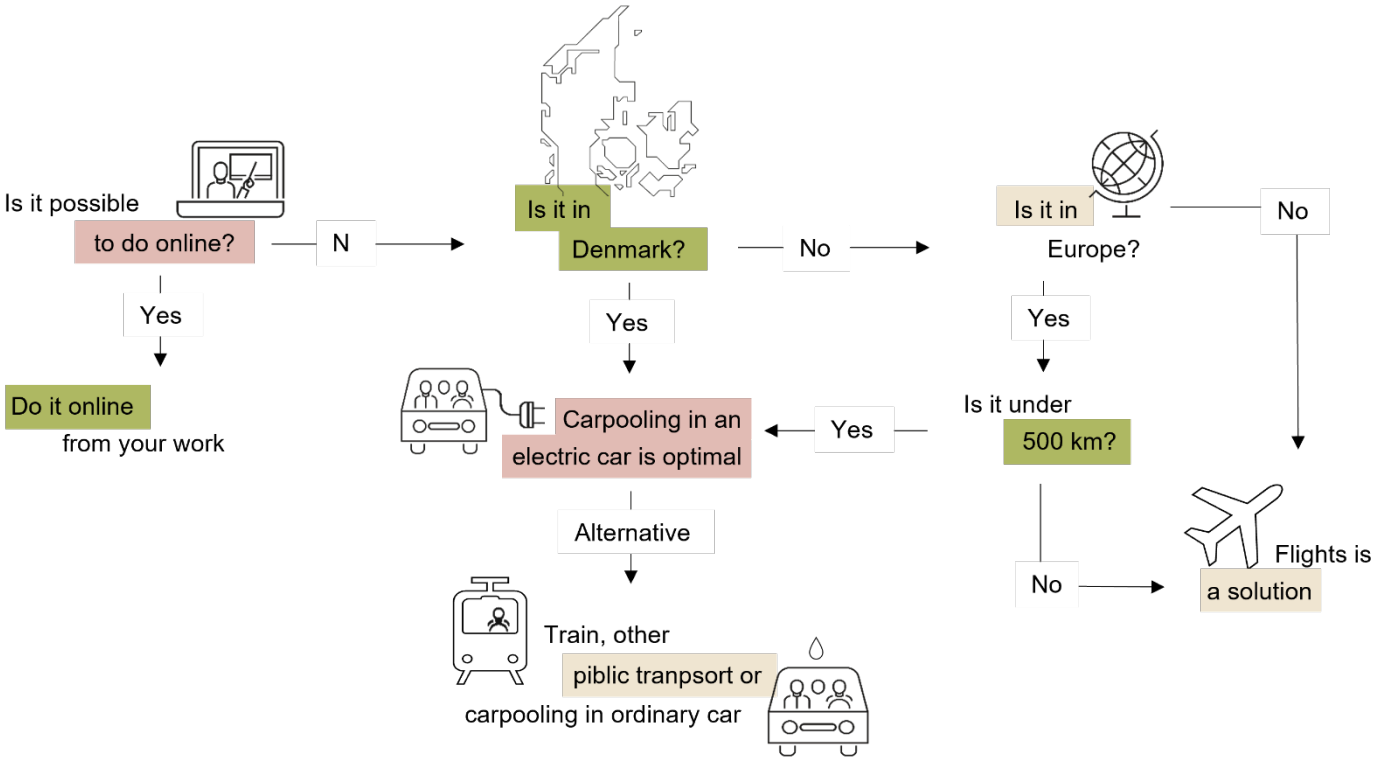
[2] https://www.sdu.dk/da/voresverdensmaal/drift_og_hverdag/klimaregnskab/klimamaal2030

[3] https://www.sdu.dk/en/voresverdensmaal/nyhedsbrev/maj23/plastgranulator

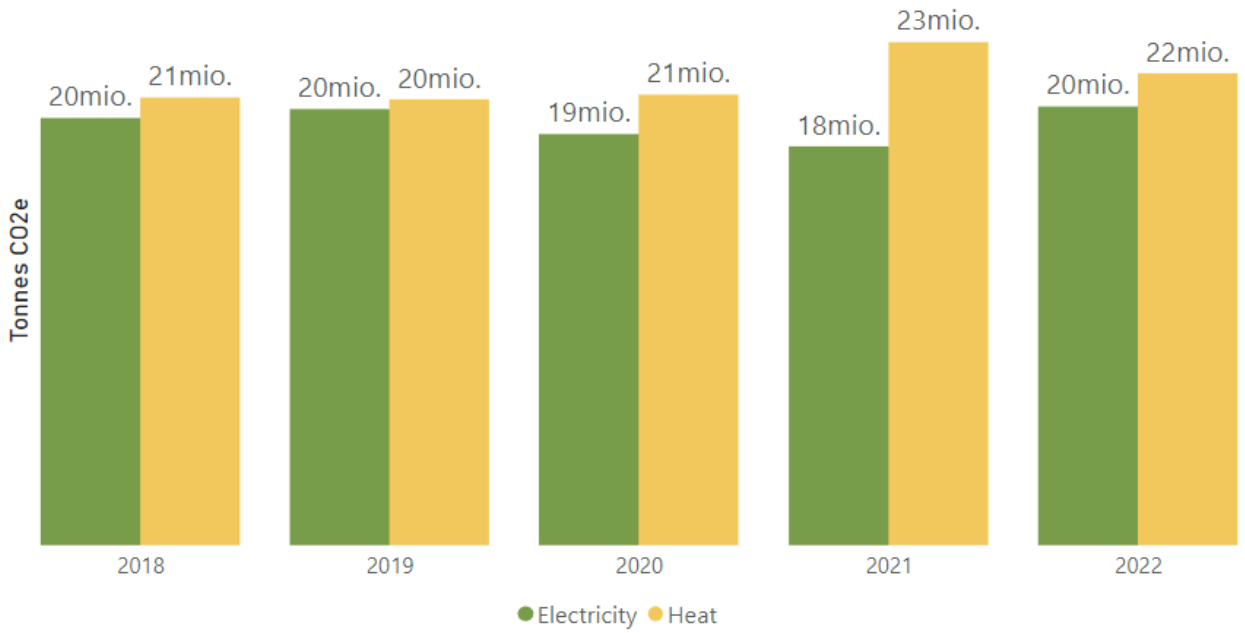
calculated based on CO_2e per km per person. The more people who travel together in a car, electric or not, the lower the emissions per person and therefore the lower the emissions per person per km.



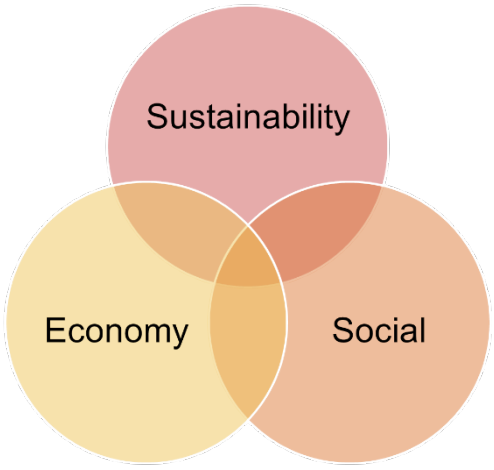
One focus area in SDU's climate plan is to reduce energy consumption in SDU's buildings and to increase the proportion of renewable energy in SDU's energy consumption. To reduce energy consumption, SDU ran a campaign reminding employees to remove plugs from the mains socket when going home from work, thereby reducing standby consumption on campus. In addition, SDU encouraged people to save hot water, and the temperature on all campuses was lowered to 19 degrees. These three initiatives started in week 43, 2022. At present, the effect cannot be seen in the overall consumption figures. This may be because the effect has been small and there has been insufficient time to generate an effect, or SDU have increased power consumption in other points, for example, by using more buildings. In fact, it is seen that total energy consumption has increased by 4%.



However, electricity has increased by 3% and heating has increased by 5%. SDU has solar panels that increase the university's share of renewable energy.



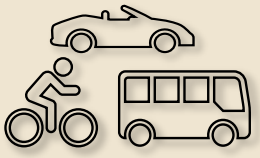
SDU is working to minimise consumption and be conscious that to the extent that consumption is necessary, it should preferably be sustainable and circular. Every time SDU purchase and consume a product, CO_2e emissions are associated with the production, packaging, transport, consumption, and disposal of the product. SDU have therefore launched several initiatives in a consumption programme to help minimise CO_2e when employees shop and consume. Examples of initiatives include SDU's commodity exchange, where you can pass on your used items to other employees at SDU, the reduction of small orders, stocking common standard goods, shared facilities across main areas and optimising internal logistics on campuses and between campuses. In all initiatives, SDU endeavour to take into account sustainability, economy and social issues, so the solutions benefit SDU as a whole.



04 Development of the climate account for SDU

Purchased goods and services

Investments



Employee and student transport to and from SDU for work or study

SDU's climate account is in development. Therefore, projects will continuously be initiated to include more categories and improve data quality. Via KMD CarbonKey, work is currently underway to include data for purchased goods and services at SDU. This will be implemented in Q2 2023, after which work will be done to improve the tool. This category will contain data going back to base year 2018. SDU aim to include this category by the end of 2023.

Work is also underway to include data on employee and student transport to and from the University in the calculations. T Commuting is a category in the GHG Protocol, and it is relevant as a Scope 3 category since SDU has an influence on these emissions. This is an aspect that is addressed in SDU's climate plan. Furthermore, the plan is that CO_2e emissions caused by SDU's investments will also be included in the account.

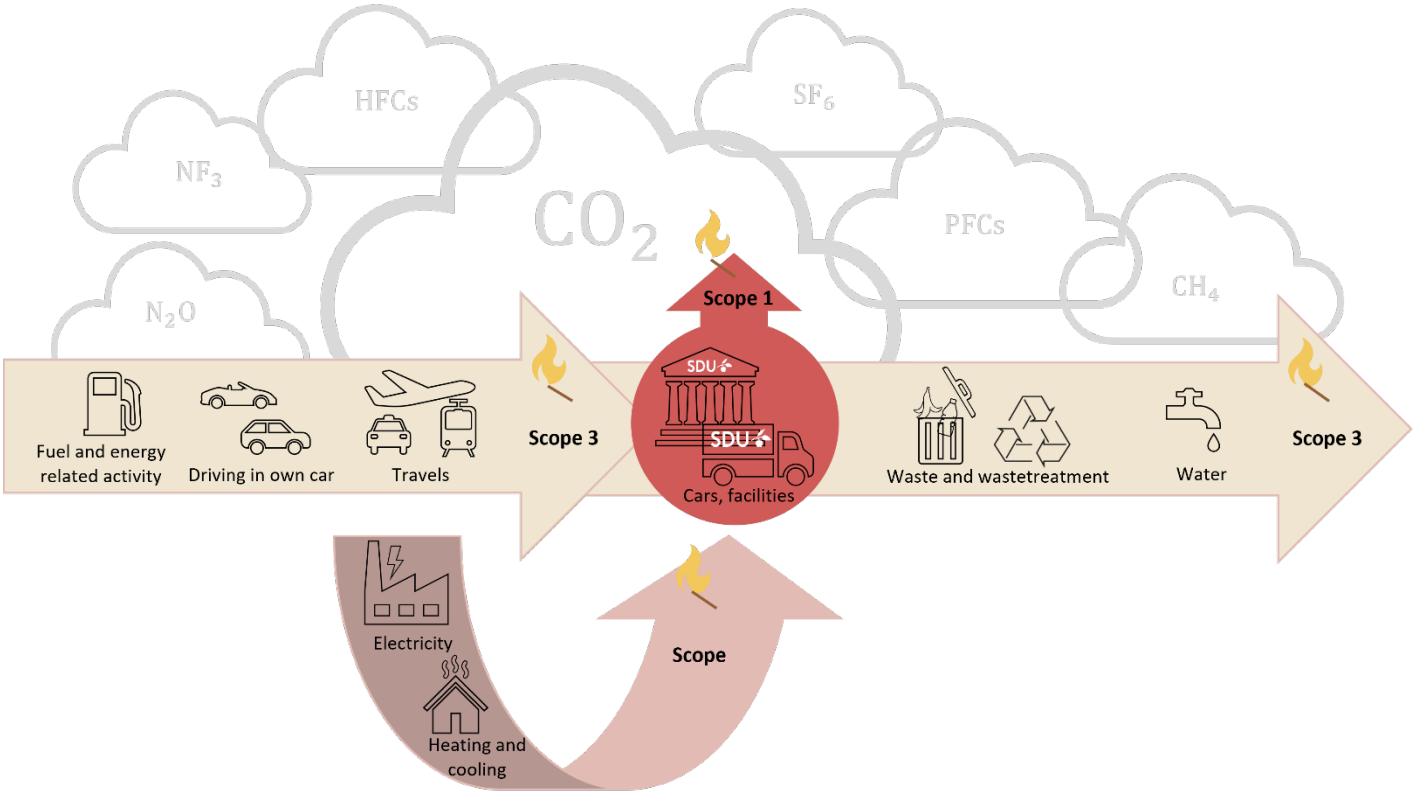
One example of work on data quality is the effort to calculate CO_2e emissions for electricity consumption on an hourly basis rather than on an annual average.

In addition, work is being done on improving the methodology in general, and SDU are following the development of requirements for CO_2e accounting. Among other things, SDU is participating in a collaboration between Danish universities to develop a common model for calculating climate accounts that universities can make use of.
In addition, the University's resources of knowledge and research are used to validate methods and results, as well as to calculate LCAs (life cycle assessments) and continuously find new methods for data collection.

Climate accounting and reporting in this area is undergoing massive development, and from 2024 some companies will be required to report on what is known as ESG/CSR. ESG stands for Environment, Social and Governance, in which climate accounting comes under 'E'. This means that in the coming years there will be a major development in guidelines, methods and norms in this area. This may mean that over the coming years it will be necessary to recalculate data using new methods or a new structure. The intention is to recalculate backwards where possible and necessary so that the accounts can be compared from year to year. In cases where activity data improves, which is likely in this development, old data cannot be recalculated. SDU aims to recalculate where possible and to stay up to date with developments in this field.

05 Method

In the preparation of SDU's climate account, the principles of the GHG Protocol[4] has been followed. This means that SDU's emissions are categorised into three scopes: scope 1 is direct emissions from SDU, and scopes 2 and 3 are indirect emissions. In relation to specific calculation methods, the methods used are described below.



There are seven greenhouse gases that are relevant to include in the calculations. These are CO_2 , CH_4, N_2O, NF_3, $HFCs$, $PFCs$ and SF_6. To calculate the total emissions, all emissions are converted into emissions of CO_2, thus the emission factors are calculated in CO_2 equivalents. SDU report on all equivalents where emission factors allow.

[4] https://ghgprotocol.org/corporate-value-chain-scope-3-standard

05.01 Delimitation

In relation to the GHG Protocol, companies are required to report on scope 1 and scope 2. This means the direct emissions from the company as well as indirect emissions related to the operation of buildings. For SDU, this applies to electricity and heating. Reporting on scope 3, on the other hand, is voluntary, and here SDU report on CO_2e emissions where possible. Data are a factor that greatly influences scope 3. In some cases, SDU do not have data for a category, and obtaining this data would be laborious.

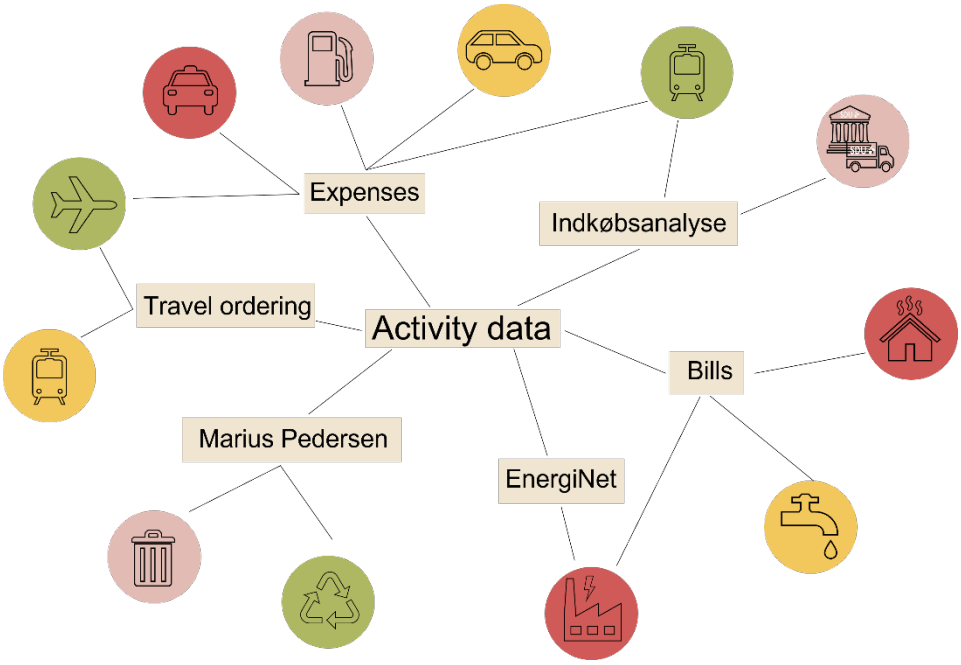
As mentioned in 'Development of the climate account for SDU', work is underway to include three new categories: 'commuting to and from SDU', 'purchased goods and services' and 'investments'.

"Fixed assets" are not yet mapped by SDU. "Transport and distribution," both upstream and downstream, require data from the university's suppliers. Upstream data is not available, and downstream data is not relevant. "Leasing and rental," both upstream and downstream, are not included as they are not currently relevant. SDU evaluates that the significance of downstream categories of sold products is minimal and therefore does not report on this category.

Here is a list of the categories in the GHG Protocol. Bold type indicates categories included in SDU's calculations; italics indicate those SDU would like to include; and categories that are irrelevant for SDU are in plain text.

Scope GHG	Type of emissions	Categories
Scope 1	Direct emissions	Company facilities **Company-owned vehicles** **Natural gases**
Scope 2	Indirect emissions	**Electricity** **Heating** Cooling
Scope 3	Other indirect emissions	Upstream: 1. *Purchased goods and services* 2. *Fixed assets* 3. **Fuel and energy-related activities** 4. *Transport and distribution* 5. **Waste generated** 6. **Work-related trips** 7. *Employee transport/commuting* 8. Leased assets Downstream: 9. Transport and distribution 10. Processing of sold goods 11. The use of sold goods 12. Waste management of sold goods 13. Leased assets 14. Franchises 15. *Investments*

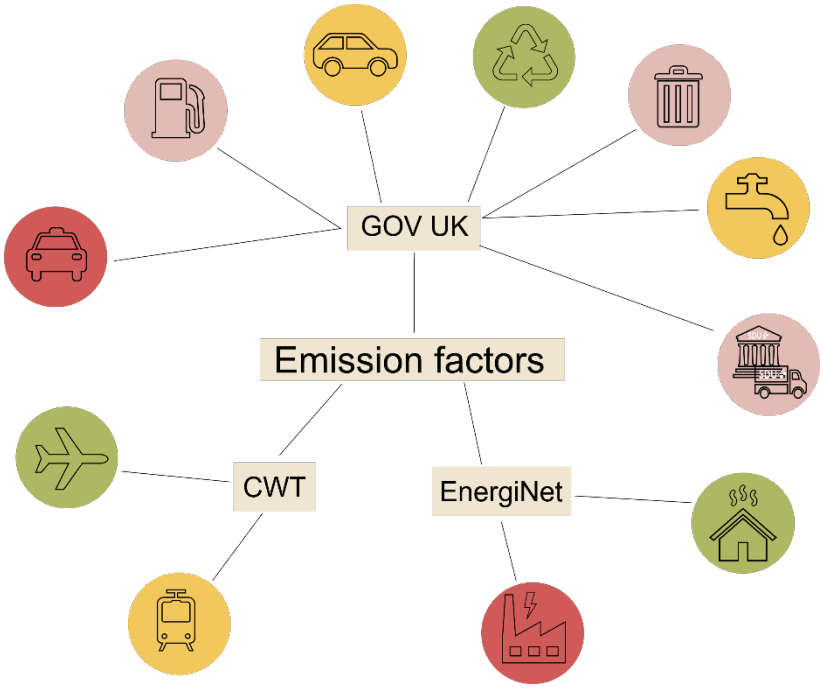
05.02 Activity data



'Activity data' describes consumption or activity. This could be electricity consumption, kilometres travelled, number of pens purchased or the price of a train journey.

In calculating the emissions of an activity, units and quantities are better than prices. It is therefore preferable to be able to obtain data on numbers, litres, weight, etc. rather than Danish kroner and øre. In some cases, kroner and øre can be converted into volume, which is better than using price.
At SDU, there are many sources of activity data.

05.03 Emission factors



Emission factors indicate what CO_2e emissions are associated with a given activity. For example, CO_2e per litre of petrol or CO_2e for one hour of cleaning. To find CO_2e emissions for a given activity, multiply it by the emission factor in the activity data.
Emission factors can be general or more specific. An example of very precise emission factors is electricity, where emission factors can be found per 5 minutes. On the other hand, there can be an average factor for pens, despite the fact that they may be produced differently.

05.04 Data sources

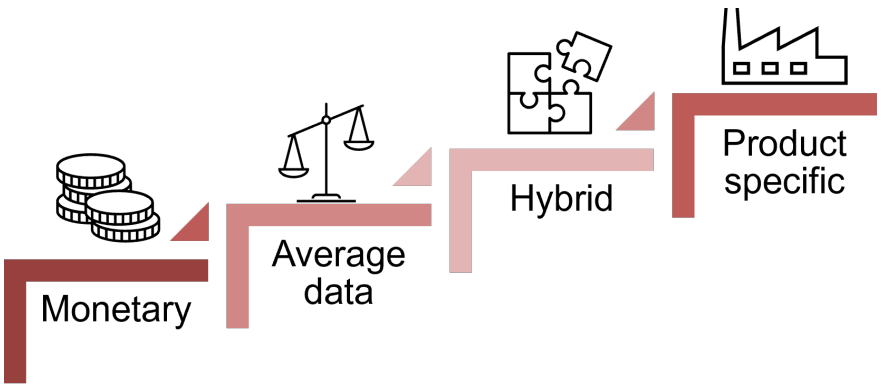
Sources for activity data are CWT, zExpense, Energinet, KMD Procurement

Analysis, invoice data on water and heating for some of the campuses and previous accounts (data for 2018 and 2019 cannot be obtained, e.g. TEM)
Data sources for Emission Factors are GOV UK and suppliers such as CWT and Energinet. The majority of the emission factors come from a GOV UK document calculated for the UK. Therefore, not all values are necessarily correct for Denmark. However, these are the best available data sources currently available for some of the categories.

05.05 Calculation methods

As already mentioned, there are many different types of activity data at SDU. To calculate CO_2e emissions, activity data should be multiplied by the correct emission factor for each category.

There are three levels for calculating a climate account. The first, and the one SDU strive for, is the product-specific factor. Here, the emissions for the product is directly from the supplier, who has calculated CO_2e per product. It can also be calculated by a third party. An example of this is emissions from air travel, for which SDU gets data directly from CWT.
If the specific emission factor for a product is not available, the average data method is used. Here, the emission factors for an entire category are multiplied by a quantity (hours, kg, etc.). This means that similar products from different suppliers will be the same. Finally, there is the monetary method. Here, an emission factor is multiplied by the price of the product. However, this means that discounts and offers yield a lower CO_2e for the same product.



SDU uses a hybrid approach, which consists of utilising supplier-specific data whenever possible. If this is not possible, average data are used and the last option is the monetary method. Large parts of the data are average data, for example, electricity or heating, where data of consumption is available in kWh.

Another example is data for taxi or train expenses, where only the amount spend is specified. This is then converted into kilometres. This is based on the monetary method.

The calculation looks like this:

$$Tons\ CO_2e\ for\ SDU = \sum_{i=1}^{N} (AD_i * EF_i)$$

$i = 1, \dots, N$ are the different categories. AD_i is the activity data either in terms of volumes or price, and EF_i is the $\mathrm{CO_2e}$ emissions per unit for the product.

06 Dictionary

Base Year: The base year that a company/organization uses as a reference for the percentage reduction in CO_2e equivalent emissions. SDU's 57% reduction by 2030 is calculated based on the premise that Denmark must reduce its CO_2e equivalent emissions by 70% in 2030 compared to the levels in 1990. Therefore, a reduction of 57% from 2018 to 2030 at SDU is equivalent to a 70% reduction from 1990 to 2030 in Denmark.

CO_2 equivalents (CO_2e): This is a collective term for the greenhouse gases: CO_2, CH_4, N_2O, HFCs, PFCs and SF_6.

Downstream activities: Activities in which SDU is the 'supplier'.

Greenhouse gases: Gases that rise into the atmosphere and contribute to the greenhouse effect.

ESG: Stands for "Environmental, Social, and Governance." It encompasses the environmental, social, and governance aspects of a company. It is often referred to as sustainability. ESG represents an organizational approach that can be used to measure and enhance a company's climate and environmental impact in relation to the United Nations Sustainable Development Goals.

Life Cycle Assessment (LCA): An inventory of CO_2e emitted for a product in its entire life cycle.

Radiative forcing (RF): Emissions of CO_2e gases are greater at altitude, where, for example, aeroplanes release a large proportion of their emissions.

Scopes: The GHG Protocol categorises emissions into three main categories: scopes 1, 2 and 3. Scope 1 is the direct emissions from company or organization. Scope 2 and 3 represent indirect emissions from a company or organization.

Upstream activities: Activities related to SDU's suppliers.

Well-to-tank: Emissions of CO_2e from the extraction and transport of fuel until it is used for refuelling.

07 Appendices

Category	Subcategory	Unit	S1 emissions	S2 emissions	S3 emissions	Source activity data	Source emission factor
Waste	Waste	Kg			11.51	Marius Pedersen	GOV UK*
Fuel	Petrol	Litres	43.69		12.41	Procurement analysis system	GOV UK*
Business travel	Fuel expenses	Litres (converted into DKK)			11.66	zExpense (travel expenses)	GOV UK*
Fuel	Diesel	Litres	77.19		18.39	Procurement analysis system	GOV UK*
Energy	Electricity	kWh		2,530.96	1,198.91	Energinet consumption, loss % from Energinet	Energinet**, GOV UK*
Business travel	Plane	CO_2e + km (converted into DKK)			2,529.41	CWT, zExpense	CWT
Business travel	Driving own car	Km			272.21	zExpense (travel expenses)	GOV UK*
Natural gases	Propane	Litres	4.58		0.54	Procurement analysis system	GOV UK*
Business travel	Taxi	£ (converted into km)			10.16	zExpense (travel expenses)	GOV UK*
Business travel	Train	CO_2e + km (converted into DKK)			79.12	CWT, zExpense, procurement analysis system	CWT, COWI
Water consumption	Water and wastewater	m^3			19.63	Consumption from energy consultant	GOV UK*
Energy	Heating	kWh		2,867.53	684.36	Consumption from energy consultant	Energinet**, GOV UK*
Total			**125**	**5,398**	**4,848**		

* GOV UK: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022
** Energinet emission factors per 5 min.: https://www.energidataservice.dk/tso-electricity/CO2Emis

The University of Southern Denmark

Phone: +45 6550 1000
sdu@sdu.dk
www.sdu.dk