OUR CLIMATE AMBITION

Roadmap towards 2030 and 2050

2022

Our Climate Ambition

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Our Climate Ambition

INTRODUCTION | WHERE WE ARE TODAY

At Arla, we strive to build a better future for generations to come. We believe that protecting the environment is essential to producing products that support a nutritious, sustainable diet. As one of the world's largest dairy companies, Arla has the size, strength and influence to make a significant impact when it comes to sustainability and protecting our planet. We take this responsibility very seriously, which is why we've committed to becoming carbon net zero by 2050.

In 2019, we committed via the Science-Based Target initiative (SBTi) to reducing absolute scope 1 and 2 greenhouse gas emissions from operations (i.e. production sites, own logistics and energy usage) by 30% from a 2015 base year*. In December 2021, we increased our target to 63%. The updated target has been validated by the SBTi as consistent with emission reductions required to keep global warming to 1.5ºC. We have also committed to reducing our relative scope 3 emissions from purchased goods and services – including raw milk from our farmer owners – by 30% per kg of standardized raw milk and whey intake by 2030 from a 2015 base year. Our scope 3 commitment meets the SBTi's criteria for ambitious value chain goals, meaning they are in line with current best practice.

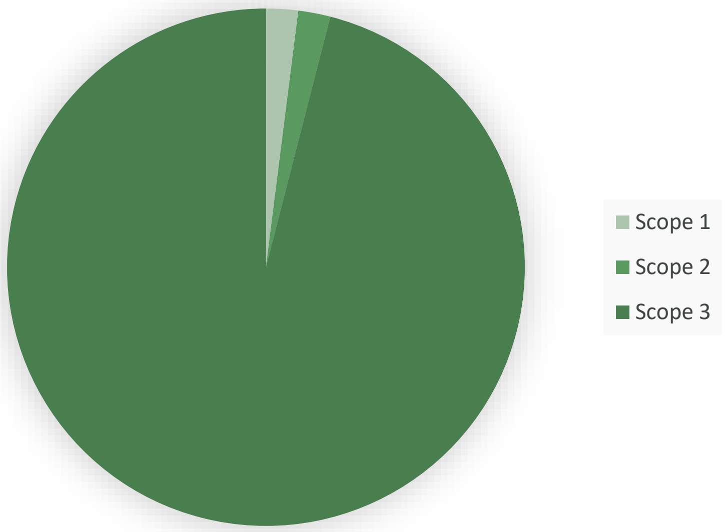
This roadmap sets out clear plans for how we'll reach our targets. Over the coming years, we will monitor our progress and share it openly, including disclosing how we are driving climate action on farms through our Climate Check programme; and publishing our yearly emissions data via our annual report and our sustainability report.

OUR EMISSION JOURNEY SO FAR

In 2021, our total scope 1, 2 and 3 greenhouse gas emissions footprint was 19,783 tonnes of CO2e. Scope 1 emissions are emissions within our direct control, such as emissions from our sites and internal transportation (Arla-owned trucks). Scope 2 is emissions coming from the energy we purchase (e.g., electricity) and scope 3 is all indirect emissions coming from the goods and services we purchase, such as packaging materials, extraction and production of fuels, external transport and treatment of waste from our sites. The main contribution to scope 3 in Arla, however, comes from our raw milk intake from Arla farmers, as the raw milk accounts for 83% of our total emissions in 2021: The breakdown of our CO2e emissions is:

- **Scope 1 (e.g. logistics):** 2%
- **Scope 2 (e.g. production sites and offices):** 2%
- **Scope 3:** 96% (Farm: 83%, Whey: 9%, Packaging: 2%, Transport and other: 2%)

Since 2015, we have reduced our emissions by 25% on scope 1 and 2 while scope 3 per kilo milk and whey has been reduced by 7%.



CO2e emissions by scope

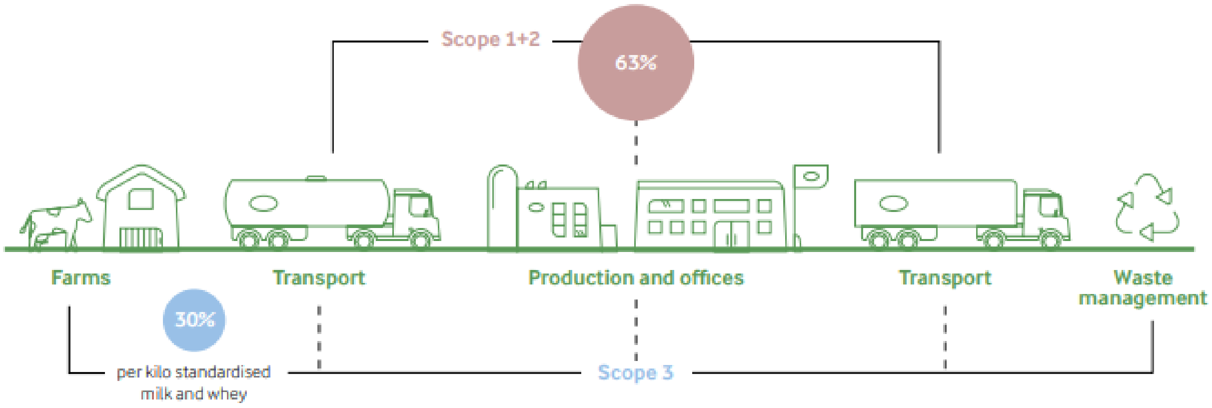
**The target boundary includes biogenic emissions and removals from bioenergy feedstocks. Methodology behind the base year calculations can be found here.*

INTRODUCTION | WHERE WE WANT TO BE

THE ROAD TO 2030

By 2030, we have committed to reducing our emissions for scope 1 and 2 by 63%. In scope 3, our target is to reduce emissions per kilo milk and whey by 30%. This is how we'll reach our targets:

- **Scope 1&2:** The main drivers for reducing emissions in logistics and production are energy and fuel efficiency, renewable electricity, alternative transportation fuels, route optimisation and circular packaging.
- **Scope 3:** Our key emission reduction areas on farm will be optimising milk yield per resource use, sustainable feed, renewable energy and green fertiliser as well as biogas, carbon farming and breeding.



2030 reduction targets

THE ROAD TO 2050

By 2050, we have committed to becoming carbon net zero by reducing greenhouse gas emissions as much as we can and compensating for the rest.

We are investing in research and innovation that we expect to unlock new ways to reduce on-farm greenhouse gas emissions. Feed additives and biochar represent two key research areas where we are encouraged by the initial findings. We will support the delivery of advanced agricultural techniques alongside efforts to accelerate towards zero emissions in logistics and production. We will continue to reduce our emissions as much as possible, but we are aware that the natural processes of dairy farming will always have emissions. These emissions that are not possible to eliminate will be counterbalanced and compensated for by investing in high quality solutions such as carbon sinks, carbon storage and/or solutions that reduce or avoid emissions.

Our roadmap towards 2030 and 2050 is described in greater detail on pages 5-23 and 24-29 respectively.


2030 AMBITION
Arla

Our 2030 Climate Ambition

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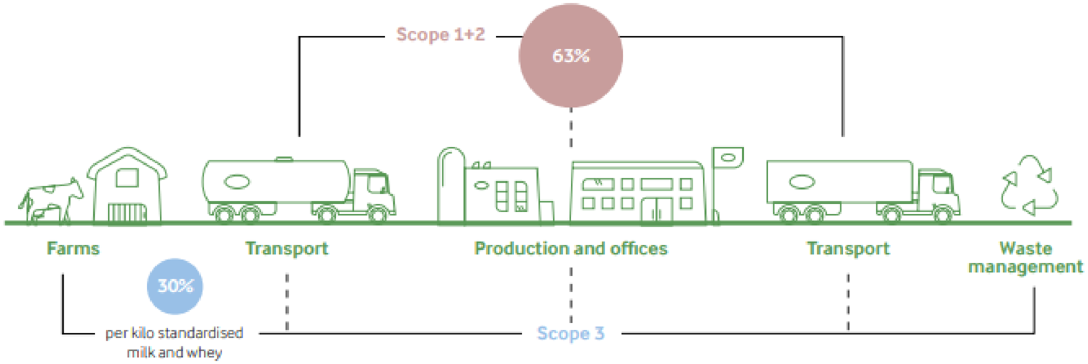


2030 reduction targets

Our 2030 Climate Ambition

REDUCING EMISSIONS ON FARM

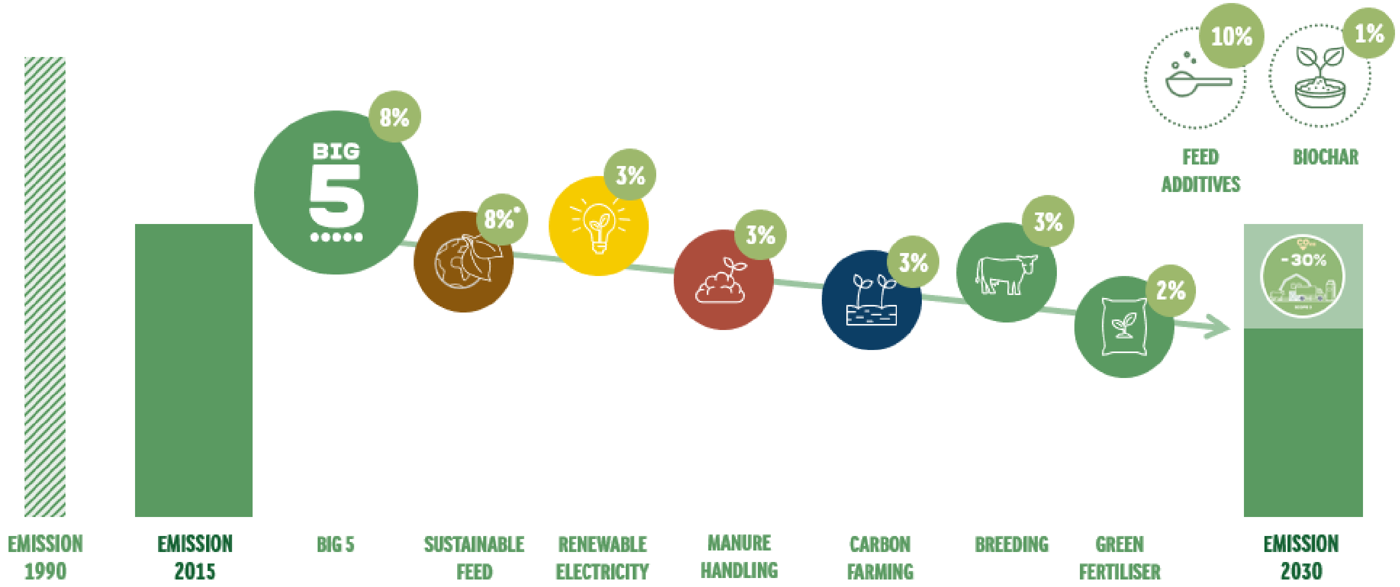
83% of the greenhouse gas emissions across our value chain happen on the farms (scope 3). That's why it's our most important focus area when we work on reducing our emissions. We are supporting Arla farmers to accelerate emissions reductions, while making sure that these reductions are financially affordable and do not affect the high animal welfare standards for Arla cows or the quality of our products.

Between 2015 and 2021, we reduced our total on-farm CO_2e emissions per kg raw milk and whey by 7%. In 2021, Arla farmers produced every kg of raw milk with 1.15 kg CO_2e on average. Our 2030 target is a 30% reduction of CO_2e emissions per kilo milk from the 2015 baseline.

HOW ARLA FARMERS REDUCE THEIR EMISSIONS

In Arla we have implemented a climate check tool, which sees the majority of Arla farmers, voluntarily, providing data on the operations on his/her farm on a yearly basis. This dataset is one of the **world's largest externally validated climate data sets** from dairy farms. In 2021, 94% of Arla farmers from seven European countries have assessed and submitted data to more than 200 questions about their herd, feed production and energy usage. The data is afterwards verified by an external climate advisor, who helps create a **personalized action plan** for the farmer to reduce his or her climate footprint based on their individual data. Dairy emissions vary from farm to farm, and what is particularly interesting to learn from is the farmers who have already shown exceptional performance leading to a low carbon footprint, inspiring and leading the way on how to reduce dairy's carbon footprint.

In 2022, our farmer owners agreed to including an incentive for climate activities in the milk price. Briefly put, this means that farmers who take action to reduce their farm's carbon footprint will be rewarded with a higher milk price.



Our way to reaching a 30% reduction of CO_2e emissions per kilo milk at farm level

Our 2030 Climate Ambition

REDUCING EMISSIONS ON FARM

'THE BIG 5': THE FIVE MOST EFFECTIVE CLIMATE ACTIONS ON FARM

Our Climate Check data has identified 5 big efficiency levers that have the greatest effect on carbon footprint at farm. Farmers can work on these within their farm management immediately without any external dependencies apart from support from the external climate advisor. Since 2021, we have run pilots together with Arla farmers to create an understanding of how we can work towards implementing these 5 big levers in the best possible way, to reduce the carbon footprint on farm.

8% BIG 5

FEED EFFICIENCY

More milk per feed input

PROTEIN EFFICIENCY

Reduce protein surplus in feed ration

ANIMAL ROBUSTNESS

Healthy cows

FERTILIZER USE

Reduce nitrogen surplus from feed production

LAND USE

Better crop yields

Our 2030 Climate Ambition

REDUCING EMISSIONS ON FARM

FEED EFFICIENCY

More milk per feed input

A cow's feed has a big influence on how much milk it produces. Feeding the cow with the right feed and in the right amount will optimize the amount of milk per greenhouse gas emissions, meaning more climate-efficient milk production. Optimizing feed efficiency requires a combination of smaller actions, rather than one clear strategy and will be individual from farm to farm. It is a constant balancing act of not feeding too much and not too little of the right blend of nutrients, to produce the best performance. Farmers can, for example, improve feed efficiency by focusing on diet composition (monitoring feed quality) as well as minimizing feed losses (from harvesting through storage and feeding).

PROTEIN EFFICIENCY

Reduce protein surplus in feed ration

Cows need protein to stay healthy and produce milk but, like humans, cows excrete unnecessary protein, causing unnecessary CO2e emissions. A cow can only eat a certain amount of forage in a day so homegrown protein and bought-in protein concentrates are efficient ways of delivering additional protein to a cow in a small package. Carefully balancing the right amount of protein that the cows need will, in most cases, limit the protein in the cows feed, resulting in a reduced climate impact, as protein often comes with a high carbon footprint. Farmers can, for example, improve protein efficiency by optimizing protein levels in the feed and optimizing feeding plans.

ANIMAL ROBUSTNESS

Healthy cows

Cows that live a long and healthy life will produce more milk over their lifetime. A longer lifespan means the cow produces milk for a larger part of her life, which improves climate efficiency. Farmers can improve animal robustness by maintaining barns, tracks and grazing areas to support good animal health as well as closely monitoring the cows' health.

FERTILIZER USE

Reduce nitrogen surplus from feed production

All Arla farms will generate manure and most of this will be applied back to the ground as fertilizer. The manure is an extremely valuable resource, but it also results in nitrogen emissions. The good news is that the amount of emissions depends on how the manure is stored and how it's applied to the fields. For example, the nutrient contents of the manure and when the manure is applied impacts the emissions. Where manure can't provide all of a crop's nutrient requirements, mineral (artificial) fertilizer is used to supplement the nitrogen and other nutrients that are required. Applying additional fertilizers to the soil also results in greenhouse gas emissions (nitrogen).

LAND USE

Better crop yields

Farmer owners utilize some of their land to produce feed for their cows. Optimizing and improving the crop yield used in cows' feed, will enable a more efficient use of land. This lever is highly connected with fertilizer use, as crops need nutrients to grow and if fertilization is not optimized, the crop yield will be affected, and thereby more land is needed to produce the same amount of feed. Farmers can improve land use via precision farming to make the most of productive soils and direct the fertiliser where it can achieve the most payback. Another possibility is to choose crop varieties that provide a higher nutritional yield.

Our 2030 Climate Ambition

REDUCING EMISSIONS ON FARM

SUSTAINABLE FEED

A cow's feed impacts the methane emissions from digestion. Science indicates that, for optimum health, milk production and climate impact, a cow has to eat the right amount of nutritious food, grown or sourced in the most climate-friendly way.

The majority of the average Arla cow's diets is made up of grass, but also includes grains and roots, concentrates and minerals, agricultural biproducts and other forages. Arla farmers continuously adjust the amount and quality of feed to support their cows need for nutrients which changes depending on age and milk yield.

To measure the true sustainability of the cows' feed, it's essential to consider not just what a cow eats, but the land used to grow the feed and where it is located, to ensure that the feed is sourced sustainably, e.g. from areas not linked to deforestation. Any feed brought onto an Arla farm comes with a carbon footprint from growing, processing and transporting the feed. For more on Arla's responsible sourcing policies, which covers soy and palm oil used in cow feed, click here.

As of now, we are not able to purchase certified sustainable soy and palm via physical segregation for organic or in the amounts needed for conventional. We therefore support the responsible production of soy through the purchase of RTRS and RSPO credits equivalent to all of the estimated soy and palm used in our cow feed. Read more about it here.

We are working towards a deforestation free commitment on feed and are currently involving the feed industry and NGOs in the process, to ensure we will be able to provide traceability and 100% deforestation-free feed for our cows in the future.

Our 2030 Climate Ambition

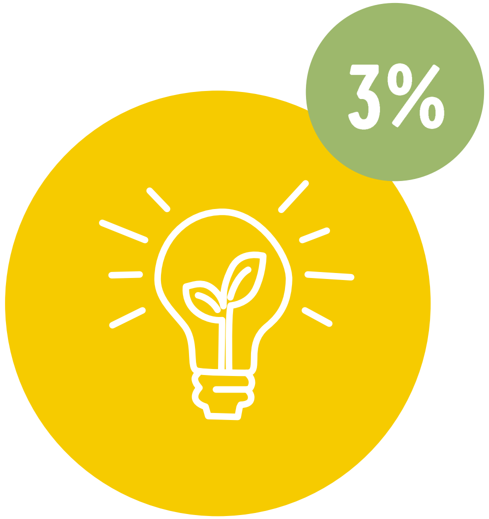
REDUCING EMISSIONS ON FARM

RENEWABLE ELECTRICITY

Today, Arla farmers use a mix of different electricity sources: many farmers get their electricity directly from the grid, whilst others produce electricity themselves, typically through on-farm biogas plants or solar panels.

Today, electricity from all sources get mixed up in the electricity grid, and all electricity from the electricity grid is considered 'black' unless you prove otherwise. In order to be able to 'prove otherwise' and classify electricity as being renewable, a Guarantee of Origin (GO) is needed.

Arla farmers can achieve 100% renewable electricity on their farms via their power company, which ensures that the electricity they are consuming is certified as renewable. This is done by the power company, which buys Guarantee of Origin (GO's) that certify that the amount of electricity used by an Arla farmer is generated from renewable energy sources. Arla farmers can also achieve 100% renewable electricity by producing their own renewable electricity via the most commonly used technologies mentioned above, which will then issue a 'GO' to certify that their own production and consumption of electricity is renewable.



REDUCING EMISSIONS ON FARM

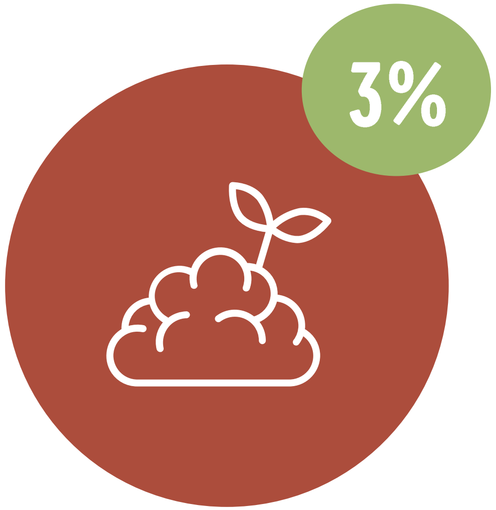
MANURE HANDLING AND BIOGAS PRODUCTION

The manure from dairy cows is a source of methane emissions during storage and application as fertilizer on the land and contributes to approximately 5-10% of the carbon footprint on farm.

Using manure to produce biogas is a truly circular process. If the manure is processed in a biogas facility, this will reduce the greenhouse gas emissions from storage of the manure on farm. Furthermore, the manure can be utilized to produce biogas or biomethane, used as heat and electricity in production, utilized in the gas grid or used as a fossil-free fuel in trucks. The remaining processed biomass can be circulated back to the farms afterwards as a higher value fertilizer, because it's more nutrient-dense and odourless than the original manure.

Some biogas is produced on large scale facilities while other biogas is produced on smaller on-farm plants.

In 2021, 17% of Arla farmers delivered manure to a biogas facility. We are working towards creating a roadmap together with Arla farmers and external partners to enable more farmers to be able to send their manure to be processed at current or new biogas plants.



Our 2030 Climate Ambition

REDUCING EMISSIONS ON FARM

CARBON FARMING

Carbon sequestration

Grasslands do not only provide nutritious feed for the dairy cows and benefit a fertile soil but are also considered to have the potential to play a key role in greenhouse gas mitigation, particularly in terms of carbon sequestration. Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide (CO2) in the soil and Arla farmers already sequester a lot of carbon in their soils today. However, by changing farming practices, the farmers can increase the amount of carbon that is stored in the soils and hence not released into the atmosphere.

Increasing carbon sequestration can be done both through a change in land management practices so that less carbon is emitted, e.g. low tillage practices, and through shifting to crops with deeper roots that can store more carbon than other crops.

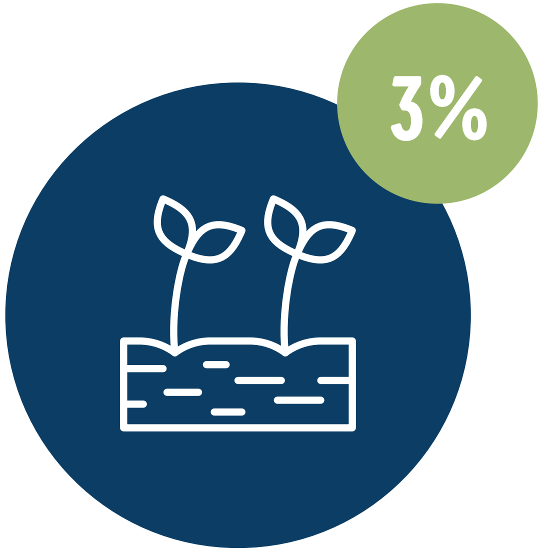
Carbon sequestration is not yet included in Arla's Climate Check tool, as methods for calculating carbon sequestration are still under development, with the first guidelines launched in September 2022 by the C-Sequ initiative (which Arla Foods is a part of) collaborating with two knowledge partners; the International Dairy Federation and the Global Round Table for Sustainable Beef. We are working towards including carbon sequestration in our Climate Check tool during 2023, so we can actively measure Arla farmers' progress.

Peat soil

Peat soil is a type of wetland and functions as the largest natural terrestrial carbon store. This soil stores more carbon than all other vegetation types in the world combined. Historically, a lot of peat soil has been drained to create more land for agricultural production. These drained areas emit considerably more CO2e compared to regular agricultural land and therefore has a negative climate impact on Arla farms that own peat land.

By restoring water levels or transforming the peat soil areas into permanent grassland these emissions can be either removed or significantly reduced while biodiversity and drinking water quality is significantly improved. Removing peat soil from agricultural production requires the farmer to either find new productive land or reduce production.

We are currently working on creating and implementing a peat soil strategy to address this, in order to preserve or restore peat soil areas to reduce the carbon emissions on farm.



REDUCING EMISSIONS ON FARM

BREEDING

Dairy cows and other livestock contribute directly to climate change through their methane emissions from enteric fermentation as well as indirectly through e.g. feed and manure. Today, there are considerable differences in the emissions produced by different types of dairy breed, e.g., due to differences in yield but also in methane emissions from enteric fermentation.

Genetics companies have been very successful in using breeding to increase yield efficiency, reduce health incidences, improve fertility and longevity. Recently, researchers have discovered that there is a genetic component to feed efficiency and methane emissions meaning that in the future, farmers can select animals with better feed efficiency (e.g. Nordic Cattle Genetic evaluation, 2019; Lassen and Dilford 2020) and lower methane emissions from enteric fermentation (Lassen & Løvendahl, 2016; Coralia et al.,2022).

To further develop this area, the relevant action for Arla is to engage in a breeding programs with leading breeding companies to establish breeding values for climate efficiency. These genetics will then be available for Arla farmers, for them to be able to reduce their methane emissions over time.

REDUCING EMISSIONS ON FARM

GREEN FERTILISER

Manure is the primary fertilizer source on Arla farms today, but mineral (artificial) fertilizers are used as a supplement (See page 9). The most common fertilizer used is nitrogen. Nitrogen is a primary nutrient for plants and plays a vital role in food production and feeding the fast-growing global population. The primary feedstock for mineral fertilizers is ammonia.

To produce ammonia a lot of fossil energy, like coal or natural gas, is needed, leading to significant greenhouse gas emissions. So, by producing the ammonia without the use of fossil fuels (e.g. running on renewable sources), the negative climate impact of the fertilizer can be significantly reduced.

We are following this development closely and staying in close dialogue with the industry. Fertiliser produced via renewable sources is not yet readily available on the market, but it is expected to become available in 2023 or 2024.

In Denmark, we are already collaborating with three large farmer-owned cooperatives through a joint company. The company will investigate the possibilities for establishing Danish production of commercial fertilizer that is made using ammonia produced though the use of wind energy.

Our 2030 Climate Ambition

REDUCING EMISSIONS IN OPERATIONS

Emissions from our production sites and offices account for 89% of our emissions in scope 1 and 2 (2021), and are emissions that we are in direct control of. These emissions occur as a result of the work that we do to process raw milk collected from our farms and produce dairy products that are sold to customers and consumers, as well as the energy that we use in our offices.

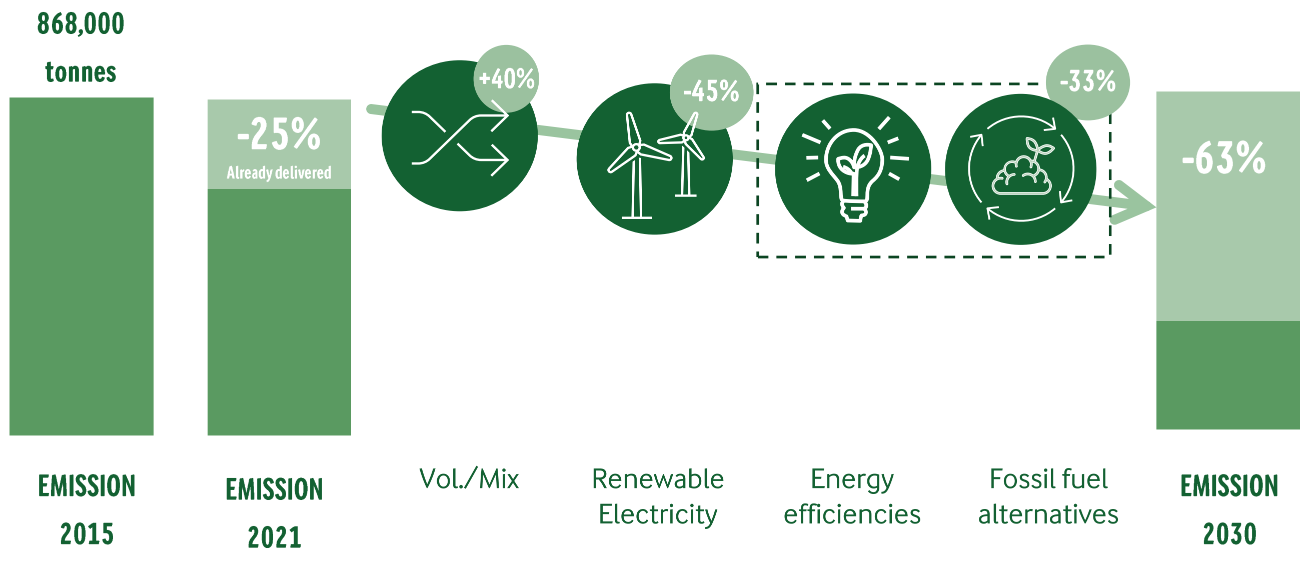
Between 2015 and 2021, we reduced our CO_2 emissions from production sites by 25%. This has been achieved through optimisations and green electricity projects such as the use of biogas in Denmark to generate green electricity at several of our sites. To reach our 2030 reduction target, we are also considering the effects of potential increased volume and changes in product mix that we expect to increase our emissions related to our operations. These impacts will be counterbalanced by further reduction actions.

Our targets

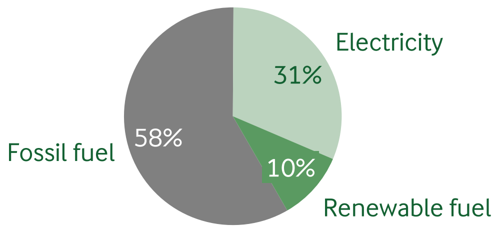
- 63% CO2e reduction in our operations by 2030 (2015 baseline)
- 100% renewable electricity in Europe by end of 2025

Our targets in scope 1 and 2 are consistent with the greenhouse gas reduction required to limit global warming to 1.5 degrees Celsius (approved by SBTi).

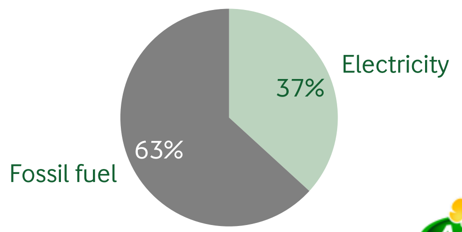
Our way to reaching a 63% reduction of CO2e emissions in operations by 2030



Energy consumption in operations (Mwh), 2021



Co2 split by energy types, 2021



REDUCING EMISSIONS IN OPERATIONS

SWITCHING TO RENEWABLE ELECTRICITY

In 2021, 25% of our electricity came from renewable energy sources (market-based), but we're planning on increasing that figure drastically in the coming years to meet our ambition of switching to 100% renewable electricity in Europe by 2025.

To achieve 100% renewable electricity in Europe, we are investing in four routes:

1. **Entering power purchase agreements (PPAs) with renewable electricity suppliers**, which typically cover a 10-15 year period and enable suppliers to invest in new projects, meaning that the renewable electricity supplied to Arla is 'additional' to what would have otherwise existed on the market, had Arla not invested in PPAs. We are aiming for 70% of our renewable electricity purchases to result in 'additional' renewable generation capacity in order to ensure that we leverage our procurement practices to deliver as much impact as possible.
2. **Buying and owning our own renewable energy projects**, e.g. solar panel on the roof top on our sites, which also enable us to ensure that the renewable electricity we receive is 'additional' to what would have otherwise been supplied to the grid, had we not invested directly. In 2022 we have started a solar project in Tychowo in Poland, which will deliver electricity directly to our site. This will reduce our CO_2 emission with ~1,750 tons pr. year. Outside Europe we are also working on renewable electricity initiatives, and in Bahrain we will install solar cells, which will reduce our CO_2 emissions by approx. 1,600 tonnes per year.
3. **Purchasing renewable electricity certificates**, to guarantee that the electricity that we buy from the grid comes from renewable electricity that is already in production (electricity bought from the grid is considered non-renewable unless proven otherwise). Since May 2021, Arla has furthermore offered farmers to buy their excess renewable electricity certificates from green electricity produced on their farm (e.g. from solar panels or wind turbines)
4. **Switching to renewable electricity and optimising energy use on-site through combined heat and power (CHP) plants.** By capturing excess heat that would normally be lost during the process of burning gas for thermal energy, CHP technologies have helped us to make our energy use more efficient. To further drive down emissions, we will ensure that our CHP plants run on green gas by switching directly from natural gas to biogas and/or buying biogas certificates to cover our energy use.

REDUCING EMISSIONS IN OPERATIONS

ENERGY EFFICIENCY

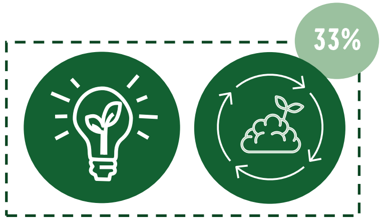
We are making investments across our dairy sites to optimise our processes, assets and equipment in order to reduce energy consumption, heat loss, waste and carbon emissions.

We are currently in the process from 2021 to 2025 of auditing all our 60 sites to identify strategic energy optimisation opportunities. By analysing and applying latest best practice and technologies to our dairy process engineering, we can reduce heat loss during milk pasteurisation and cooling, as well as increase our ability to capture and reuse heat. For example, by insulating coil and pipes; designing pipework to enable easy milk flow and reduce pumping needs; installing cutting-edge heat pumps; and monitoring milk flows to ensure optimal performance. We have already made strides to reduce emissions at several of our sites. For example:

- At our milk powder production plant AKAFA in Denmark, an evaluation of production flow resulted in an investment in a new powder transport line. The 150-metre installation connects the site's newest and most energy-efficient spray-drying. By allowing milk powder production to be transferred to a newer more energy efficient dryer, this optimisation of internal logistics has reduced scope 1 and 2 carbon emissions since 2021 by an annual 418 tonnes. This equals to a 1% reduction, excluding certificates.
- Our site at Nr. Vium in Denmark invested in a new distribution system for low-temperature hot water in 2021 to make better use of the heat from its biogas engines. The system produces hot water used for process heating, cleaning purposes and room heating, which reduces the need for fossil natural gas to produce steam, which is primarily produced by a natural gas-fuelled boiler. The investment reduces the dairy's carbon footprint by an annual 13% vs 2021 emission (~1.900 tons CO_2 every year). A further energy performance boost is scheduled.
- Similarly, Rødkærsbro dairy in Denmark will utilise heat from the site's existing refrigeration plant and biogas-fired combined heat and power plants (CHP) to heat water, simplifying the energy supply in preparation for increasing electrification of dairy processes. A 5% reduction in annual carbon emissions is expected (~1.200 tons CO_2 every year vs 2021).
- We also assess the condition and energy efficiency of all our assets and equipment at site on an ongoing basis to identify opportunities for replacement or modification. For example, in the UK, we have replaced approximately 85% of the light sources across all sites with energy-efficient LED solutions (approx. 50-70% CO2 saving per light switched per year) and we have plans to achieve 100% coverage on sites across Europe during 2022 & 2023.
- In April 2022, we also completed the process of installing new state-of-the art milk powder dryers at our Westbury site in the UK, which will enable reuse of excess heat and result in savings of 4,400 tCO_2 every year (approximately 8% of the site's total emissions). This equals a 13% reduction vs the site's 2021 emission.
- A new boiler was installed at the dairy in Visby in Sweden in 2021 and Jönköping dairy in Sweden will have a new boiler installed in 2022. Both boilers are replacing the last fossil energy consumption on site equal to 40 tonnes emission in 2021. In Visby, this reduced site emission by 700 tonnes equal to a 21% reduction vs the site's 2020 emission, excluding certificates.

Human behaviour also has a key role to play, and we are working hard to build an energy and carbon performance management culture so that our pursuit of efficiency and optimisation continues to be ingrained in our ways of working. For example, in 2022, we have been introducing energy saving 'champions' across all our sites to help us maintain a strong and standardised energy optimisation approach.

We are currently upgrading our carbon and energy data management systems to improve transparency around how we use energy on sites and for what purpose, with a view to increasing transparency, driving behavioural change and strengthening investment decisions.



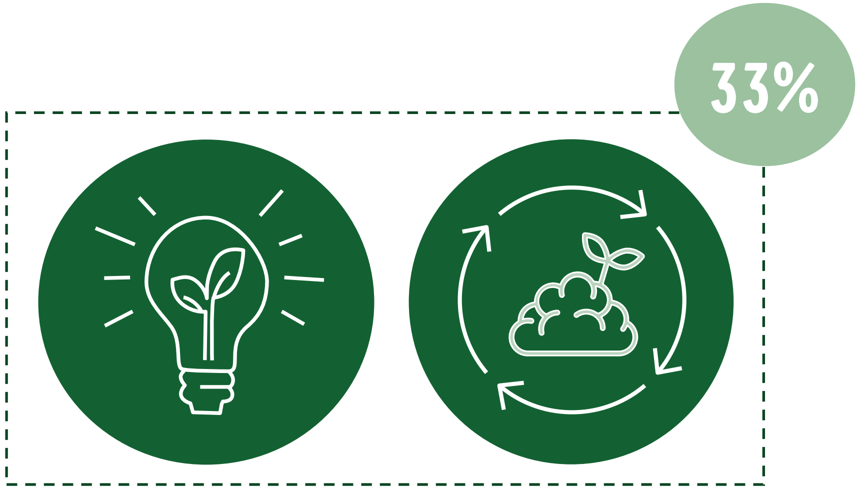
REDUCING EMISSIONS IN OPERATIONS

FOSSIL FUEL ALTERNATIVES

Arla is focusing on electrification as we have also committed to change to 100% renewable electricity by 2025 in Europe, but not all processes and equipment are possible to electrify. We are therefore also focusing on replacing the remaining fossil fuel with alternative energy sources such as biogas, biomass or district heating with zero or significantly reduced carbon impact.

Some examples of emission levers towards our 2030 commitment:

1. **Biogas**: Biogas is a mixture of gases produced from raw materials such as agricultural waste, farmers' manure and other organic waste. Biogas is a renewable energy source with zero carbon emission in scope 1+2 and therefore ideal to use instead of natural gas. In Arla we already use biogas at multiple sites e.g. Holstebro, Bislev, Danmark Protein and Rødkærsbro. For Danmark Protein, Arinco and Nr. Vium, the biogas comes from an Anaerobic Digestion (AD) plant in the neighborhood, but for example, Rødkærsbro is supplied with biogas that is produced by two local farmers and directly wired into the site.
2. **Biomass**: heat produced from forecast biomass is often used in Sweden as a renewable energy source. It is therefore also an energy source we are investigating, and it is already used at six sites in Sweden.
3. **District heating**: a lot of district heating is either 100% renewable energy source or with a very low carbon emission, why this is also believed to be a good alternative to natural gas. We are also currently developing a project to partly convert our heat demand at a Danish site through district heating.



Our 2030 Climate Ambition

REDUCING EMISSIONS IN LOGISTICS

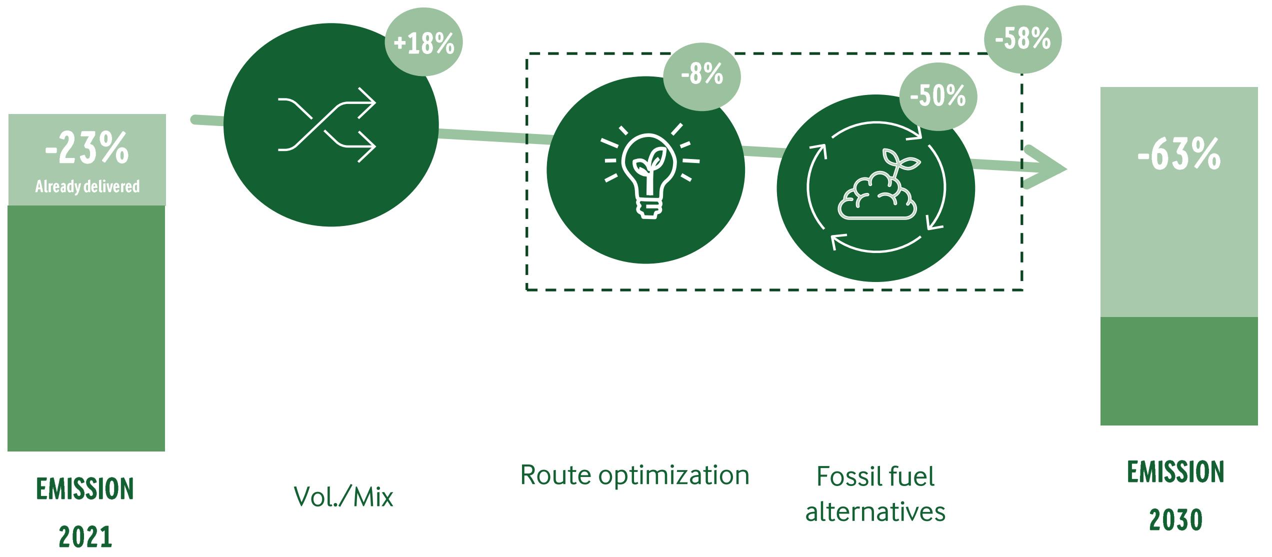
In Arla we have our own fleet of trucks in logistics, which means that their greenhouse gas emissions are in our direct control. However, we also have a part of our distribution done by third parties, which means we only have limited control over their emissions. In this section we'll describe how we'll reduce our own fleet's CO2 emissions, while we try to encourage our logistics partners to do the same.

Emissions from internal transport and logistics make up 11% of our scope 1 and 2 emission and if we include third-party logistics it accounts for 39%. This covers the collection of raw milk from our farmers and transporting it to our dairies as well as the delivery of finished goods to distribution centres and our customers. Between 2015 and 2021, we reduced our total logistics CO_2 emissions, including third-party logistics, by 4%, while we reduce our internal fleet's CO_2 emissions by 23%, via primarily route optimisation and switching to alternative fuels/trucks, e.g. from diesel to battery electric vehicles, biogas and biofuels. To reach our 2030 reduction target, we are also considering the effects of potential increased volume and changes in product mix that we expect to increase our emissions related to logistics. These will be counterbalanced by further route optimization and shifting to fossil fuel alternatives.

Our logistics targets

- 63% CO_2 reduction in our logistics fleet emissions by 2030 (2015 baseline)
- 30% CO_2 reduction in third party logistics provider fleet emissions by 2030 (2015 baseline)
- Fossil-free Arla fleet in core markets (Denmark, Sweden, Finland, Germany and United Kingdom) by 2030

Our way to reaching a 63% reduction of CO2e emissions in logistics by 2030



Our 2030 Climate Ambition

REDUCING EMISSIONS IN LOGISTICS

ROUTE OPTIMISATION

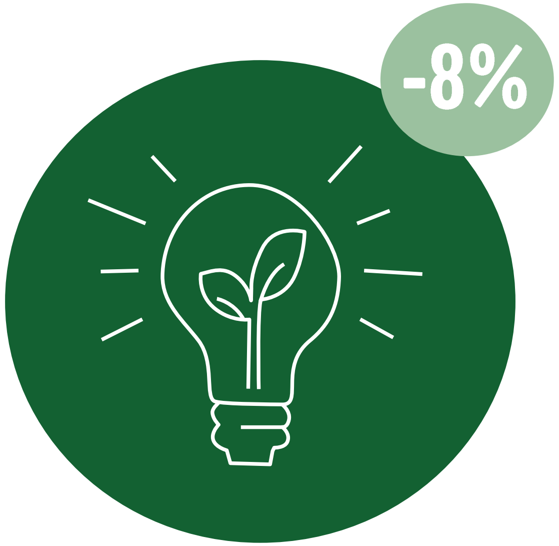
We are continuously working towards optimising our logistics operations to reduce road miles and improve efficiency to reduce our CO2 emissions.

We are actively working with customers, Arla farmers and suppliers, to decrease the distance that our milk tankers and trucks travel through network and route redesign to reduce fuel usage. Here are a couple of examples of how we have already reduced emissions in logistics:

- Minimising the frequency of milk collections from Arla farms and route optimization, which saved over 800 tonnes CO_2 in 2020 and 2021 alone compared to 2019 – equivalent to taking four Arla trucks off the road for a year.
- Simplifying our logistics network, optimising routes and delivery frequency to customers, which has saved over 1.200 tonnes of CO_2 per year since 2019 – equivalent to taking 15 Arla trucks off the road for a year.

We are also working on fuel optimization by:

- Educating our drivers to work towards the most efficient driving practices.
- Measuring and following up on driver behavior.
- Ensuring that we optimize our fill rate on our vehicles, which means that trucks are optimally loaded for each of our routes, to increase efficiency and reduce fuel consumption.



REDUCING EMISSIONS IN LOGISTICS

FOSSIL FUEL ALTERNATIVES

Today, most of our logistics fleet use fossil fuel (with B7 bio diesel) with the latest, most fuel-efficient euro 6 Technology vehicles and the fuel infrastructure is readily available everywhere. We're aiming towards a completely fossil-free internal logistics setup towards 2030 in order to reduce our carbon footprint. This means that we need to switch to fossil-free fuel types, e.g. increased bio content in Bio diesel, biofuel or biogas/biomethane with less CO2e emissions or exchange our trucks where possible to Battery Electric Vehicles or Hydrogen Vehicles.

Our logistics in Sweden have been frontrunners in transitioning to fossil free fuel. In 2018 they achieved the impressive milestone of converting every single truck to lower carbon energy sources like biodiesel and biogas.

CURRENT EMISSION LEVERS TOWARDS 2030

- **Biogas:** Where feasible, we will convert our heavy and long-distance fleet to biogas – a renewable fuel that is produced from organic matter like sewage, food waste, animal waste and agricultural materials. Powering logistics trucks with biogas instead of diesel can eliminate approximately 80% emissions that would otherwise have been generated.
- **Biodiesel:** While we have clear plans for converting our internal fleet to run on biogas, there are challenges – not least the varying availability of biogas for transportation. Diesel truck engines can, however, be converted to run on biodiesel with relatively minor modifications, making biodiesel a useful alternative until availability of biogas or Battery Electric/Hydrogen vehicles are available. Using biodiesel could reduce our Co2e emission by ~80%.
- **Electric/Hydrogen vehicles**: We will also continue to explore opportunities to transition to battery electric vehicles on our urban fleet, where we today have three in Sweden and one in Denmark. This is a technology in fast development currently, where the current challenge is to improve battery electric vehicles for long distance trips.

REDUCING EMISSIONS OF OUR PACKAGING

Packaging materials (for example, plastics, paper and board, metals, glass) play a critical role in ensuring the safety and quality of our products. Overall, in 2021 packaging accounts for 2% of our total carbon footprint in scope 3. When we decide which packaging to use for our products, we consider both the environmental impact of the chosen material as well food security and quality, amongst other aspects.

Our packaging ambition (for our own brands)

- 100% recyclable packaging by 2025
- 0% fossil-based virgin plastic in our packaging by 2030

TOWARDS FULLY CIRCULAR PACKAGING

We want to make sure that our packaging is produced with the lowest possible emissions while also ensuring that none of our packaging ends up in landfill or contributes to pollution or resource degradation of any kind. These are big ambitions and achieving them in a balanced way will be very challenging, but we believe that the best approach to doing so is to rollout a fully circular packaging approach, which will help reduce Co2 emissions from our use of packaging.

Three steps towards 2030 & more sustainable packaging

1) Designing for circularity: We design our packaging to be recyclable, reusable or compostable and help consumers to have the right information so they can dispose of it responsibly to keep it in the value chain. By the end of 2021, 90% of our packaging material was recyclable.

For us to achieve our commitment on recyclability, the packaging for our brands need to be able to be recycled in the country it is consumed. Because of that we are working to convert multi-material packaging to mono-material solutions to increase recyclability. Challenges still remain in some of our International markets where waste collection infrastructure is developing and not at the same level as in our core European markets. This challenge will continue to be worked on in our roadmaps alongside collaboration with external connections.

2) Responsible material: We use less and better materials with a high focus on responsible sourcing. We are working towards eliminating fossil-based virgin plastic by prioritising use of recycled plastic and renewable plastic, where our biggest challenge is to ensure availability. We are also working towards switching to non-plastic alternatives (e.g., cartons and other fibre-based materials) where feasible.

3) Collaborate for impact: We collaborate with local authorities to ensure that our packaging can be collected and recycled, that the right infrastructure exists to enable our consumers to easily sort and recycle our packaging. We collaborate with suppliers to accelerate the innovation required to unlock the circular packaging solutions of tomorrow.


2050 AMBITION
CARBON NET ZERO
Arla
2050
Arla

Our 2050 Climate Ambition

REACHING CARBON NET ZERO

When we have reached our targets for 2030, our attention will turn to our ultimate ambition, which is to reach carbon net zero by 2050. That means that we'll have reduced our emissions as much as we can and compensated for the remaining emissions.

Reaching carbon net zero will be a huge challenge, and we don't have all the answers to how we'll achieve it yet. That's why we are investing in research and innovation that we expect to unlock new ways to reduce on-farm greenhouse gas emissions, which account for 83% of our emissions currently (2021). Feed additives and biochar represent two key research areas where we are encouraged by initial findings. We will support the delivery of advanced agricultural techniques alongside efforts to accelerate towards zero emissions for our logistics and production operations. To mention a few of the emerging technologies, 'Power-to-X' and hydrogen are areas we are looking into as a potential future energy source, alongside biogene pyrolysis carbon capture (thermal processing of waste) to utilize surplus heat, AI machine learning and battery for electricity storage.

We will continue to reduce our emissions as much as possible, but we are aware that the natural processes of dairy farming will always have emissions. These emissions that are not possible to eliminate will be counterbalanced and compensated for by investing in high quality solutions such as carbon sinks, carbon storage and/or solutions that reduce or avoid emissions.

In the following pages we will describe which activities and developing technologies will help us reduce our CO_2e emissions on farm as well as in operations and logistics beyond 2030 towards 2050.

Our 2050 Climate Ambition

REDUCING EMISSIONS ON FARM

We expect the following research projects to play an important role in reducing CO2e emissions at dairy farms towards 2050.

Feed additives: We are already supporting research to develop new and broadly applicable feed additive products like seaweed and chemical products. The target is efficient, safe, long-lasting, environmentally friendly products for grazing animals as well as conventional and organic dairy production that will significantly reduce methane emissions from cows' digestion. We are furthermore exploring technologies like phages and lactic acid bacteria (LAB) to indirectly inhibit the methane producing organism, Archea, from producing methane.

Reduce N_2O emissions: We're also working on developing a protocol for eco-tox risk assessment including ground water protection of nitrification inhibitors and metabolites as a climate mitigation tool to reduce emissions of green house gasses like nitrous oxide from crops and pasture systems. The synthetical products that are currently being developed effectively reduce emissions from manure and mineral fertilizer use. Different crop rotation systems including new species, species combinations and natural nitrification inhibitors are investigated for efficacy of reducing GHG emission from the fields.

Carbon sequestration: Various projects are running to quantify capturing and storing of atmospheric carbon dioxide in carbon pools. The purpose is to balance GHG emissions with carbon removals to reach carbon net zero. We're mainly exploring biological carbon sequestering by storing carbon in soils and vegetation e.g. perennial pasture management, no tilling practices to increase root biomass content, exploring how to increase photosynthesis by grasses and herbal species. We're also exploring techniques to physically capture carbon by use of pyrolysis technology to produce biochar and store carbon in the soil.

Hardware equipment to dairy farms: We're also supporting research looking into physical methane filters that will eradicate low-concentration methane. This can be done either by using filters or photochemical systems that are installed in the barn where the cows are or in slurry tanks.

Breeding/genetics: Projects are being conducted to use selective breeding as a tool to breed cows that emit less methane when they digest their feed. The idea is that climate efficiency is considered, when cows are bred, to a larger extent than it currently is.

Sustainable feed: This project looks at developing alternatives to traditional cow feed by supporting research within biorefining of grass proteins for livestock. This project also explores growing seaweed in the ocean or inner fjords to produce feed proteins and biomass as animal feed to avoid competition with humans for crops as well as excess nutrients from harvesting leaking to the sea. This project also investigates the use of alternative protein sources like rape seeds, genetically modified beets and new processing technologies like fermentation inoculums to increase feed utilization in dairy cows.

Data driven development: We are supporting research into predicting the impact on agriculture under future scenarios of climate change. The model is optimised on for example land use, hydrology and soil quality. These elements will contribute to the overarching aim: to characterise potential trade-offs and synergies of innovations and identify sustainable transitions. This will derive credible, relevant and effective pathways for sustainable development in the livestock sector to inform policy and business strategies.

Our 2050 Climate Ambition

REDUCING EMISSIONS IN OPERATIONS

We are investing and forming partnerships with suppliers to identify and explore emerging technologies in order to unlock new ways of reducing CO2 emission from our sites. Emerging technologies and new fuel types are also expected to a play an important role in us reaching carbon net zero by 2050. The main areas for reducing CO2 emissions in operations are:

Power-to-X (PtX) and hydrogen: We are currently engaged in a PtX feasibility study for our German site in Pronsfeld to investigate whether hydrogen can be a renewable energy source for milk powder production instead of natural gas. The CHP (combined-heat and power) plant is already setup to be able to run on 25% hydrogen. We are in dialogue with a Danish PtX developer to utilise green hydrogen for heating purposes at Danish sites. We are in dialogue with a Danish PtX developer to utilise high temperature surplus heat from green ammonia production at one of our dairies.

Carbon capture and storage: We are investigating and monitoring the development in the area to identify possibilities to do pilots or utilise upcoming solutions.

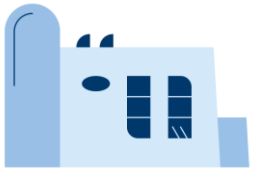
Low-carbon technology: We're exploring, reviewing and piloting new/emerging low-carbon technologies for high temperature heating (for example, spray driers and high temperature heat pumps). The ability to produce from heat pumps is still under development, especially for higher temperaturs (+140 degree celsius), but we are exploring it through, for example, a pilot project with an external research institute on a high temperature heat pump in one of our sites in Denmark.

Battery for electricity storage: At our Polish Tychowo site, we're testing a setup where surplus electricity generated from solar panels can be stored in a battery and used on site in periods without solar production.

Exploring AI machine learning: We're also exploring sophisticated energy and plant monitoring software to learn the optimum energy and operating profile for a plant under a range of operations and products. The machine learning software is currently being trialled at Settle dairy in the United Kingdom.

Demand-side response: We increase or reduce energy consumption to better absorb renewable energy or build storage/buffer capacity to enable better balancing and utilization of renewable energy. This means we avoid consumption to reduce peak demand and shift between energy sources according to what is in abundant supply at a particular point in time.

R&D demonstration for biogene pyrolysis: We're partnering in a Research & Development project about biogene pyrolysis carbon capture (thermal processing of waste) to utilise surplus heat from the process to one of our sites.



REDUCING EMISSIONS IN LOGISTICS

We are making partnerships with truck suppliers to identify and explore emerging technologies to find new ways of reducing CO2 emissions from our logistics setup. Emerging technologies and new fuel types will play a key part in us reaching carbon net zero by 2050.

Digital solutions: We are following the development of digital solutions that can optimize how well we utilise our fleet, creating visibility to improve our planning and execution of our routes to save fuel and reduce emissions.

Electric Vehicles: We are currently deploying Battery Electric Vehicles and following the development closely. Hopefully, this technology will have matured considerably towards 2030.

Hydrogen Fuel Vehicles: Similarly, we are following the development of Hydrogen Fuel Cell Electric Vehicles, powered by hydrogen, as a solution for our long-distance, heavy-weight operating fleet towards 2050. We are engaged in trial project discussions In Germany and the United Kingdom to explore the use of Hydrogen trucks and the development of green Hydrogen fuel infrastructure for transportation.

Ancillary equipment: We are exploring new ways to power our milk collection equipment and transport refrigeration cooling units with electricity rather than fossil fuel.


Arla