Environmental Defense Fund

DAIRY METHANE ACTION ALLIANCE DMAA

DAIRY METHANE STAKEHOLDER ENGAGEMENT

A guide for engaging stakeholders on dairy methane emissions mitigation

Environmental Defense Fund
Pure Strategies Inc.


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With more than 3 million members, Environmental Defense Fund creates transformational solutions to the most serious environmental problems. To do so, EDF links science, economics, law, and innovative private-sector partnerships to turn solutions into action.

Dairy Methane Action Alliance

The Dairy Methane Action Alliance (DMAA) is a global initiative to accelerate action and transparency on methane across the dairy sector. By joining this groundbreaking initiative, signatory companies commit to account for and publicly disclose methane emissions within their dairy supply chains and to publish and implement a comprehensive methane action plan. Environmental Defense Fund and the sustainability nonprofit Ceres will help to ensure companies are making progress against key milestones.

At the time of printing this guide in May 2025, DMAA signatories include: Agropur, Bel Group, Clover Sonoma, Danone, General Mills, Idaho Milk Products, Kraft Heinz, Lactalis USA, Nestlé, Savencia Fromage & Dairy, and Starbucks.

Pure Strategies Inc.

Pure Strategies is a sustainability consulting firm that empowers brands, retailers, and NGOs to realize meaningful environmental and social improvement. Founded in 1998, Pure Strategies helps companies on their sustainability journey with a focus on goal setting, effective management strategies, and redesigning products and supply chains that deliver value to the business and society.

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Report design: C.G. Coleman

The complete report is available online at https://business.edf.org/insights/dairy-stakeholder-engagement.

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EXECUTIVE SUMMARY

Reducing methane emissions, particularly from dairy cattle, is a critical opportunity to slow the rate of global warming in the near term, given methane's high potency and short-lived nature in the atmosphere compared with carbon dioxide (CO_2). With the intensifying risks that climate change poses to companies, especially those in the food sector, methane action offers a powerful opportunity to drive innovation and enhance resilience throughout supply chains. Dairy value chain actors are increasingly aware of the critical role they can play in driving methane reductions, and as a result, are prioritizing methane mitigation by measuring and disclosing their methane emissions, setting emissions reduction targets, assessing their impacts, and engaging on farm to drive reductions. The Dairy Methane Action Alliance (DMAA) and Environmental Defense Fund (EDF) have developed guidance to help companies eager to take a leadership position on dairy methane work through every stage of this process.

Targeted dairy methane action plans (DMAPs) to address emissions hotspots can help companies articulate and disclose programs and projects to reduce dairy methane emissions in the near term. To implement their DMAPs and reduce methane across the value chain, companies must engage diverse stakeholders across the strategic areas of farmer and supplier engagement, innovation, and public policy and advocacy. Collaboration between farmers, cooperatives (co-ops), processors, consumer packaged goods brands (CPGs), retailers, researchers, policymakers, financial institutions, civil society, and other stakeholders is vital to developing and sharing the networks, knowledge, resources, technology, and financing needed to reduce dairy methane and drive industry-wide change.

This guide outlines ways companies can engage both internal and external stakeholders to help support their methane reduction journeys. This guide also includes industry examples of successful stakeholder engagement, existing stakeholder initiatives that continue to catalyze dairy methane work, and key questions to consider as companies work to implement their DMAPs with stakeholders.

TABLE 1

Stakeholder engagement on dairy methane mitigation: Benefits, challenges, and modes of engagement by strategy

	Farmer and supplier engagement	Innovation	Public policy and advocacy
Benefits	✓ Improved relationships, increased trust and visibility in the supply chain ✓ Value chain decarbonization ✓ Supply chain and operational risk mitigation ✓ Increased shared value ✓ Environmental, social, and governance (ESG) improvements ✓ Improved products and materials ✓ Regulatory compliance ✓ Reputational benefits	✓ Opportunity to gain competitive advantage ✓ Unlocks new solutions and bolsters existing solutions for methane reductions ✓ Ability to implement solely with internal stakeholders ✓ Generation of additional revenue streams through product development ✓ Potential to unlock sector-wide insetting and co investment opportunities and collaboration	✓ Catalyzes action across the dairy industry ✓ Demonstrates leadership ✓ Contributes to long-term viability of solutions
Challenges	✓ Complex supply chains limit transparency between upstream suppliers and downstream customers ✓ Risk-aversion among suppliers ✓ Trust building between customers and farmers ✓ Limited availability of mitigation solutions on dairy farms ✓ Dairy company purchasing power and partnership opportunities can be limited under certain circumstances ✓ Time, resource, and financial constraints of practice and technology adoption ✓ Distribution of responsibilities, cost, income, and risk across supply chain actors implementing emission reduction initiatives	✓ Long-term strategy without immediate methane reductions ✓ Emissions reductions not yet demonstrated for certain technologies ✓ Some solutions and technologies can be financially unviable for farm-level implementation ✓ New technology can be cumbersome and often have a lengthy approval processes ✓ Consumer understanding and acceptance of new technologies	✓ Long-term strategy without immediate methane reductions ✓ Regulatory complexity ✓ Gaining internal (dairy company) alignment on policy positions ✓ Conflicting interests of different internal and external stakeholders
Modes of engagement	**Capacity building and technical support** ✓ Technical assistance ✓ Training programs and courses ✓ Trialing/piloting sustainable practices **Financial investments and incentives** ✓ Loans and grants ✓ Discounts/subsidies ✓ Pay for performance/financial rewards **Data gathering and networking** ✓ Simplifying data collection ✓ Setting up measurement, monitoring, reporting, and verification (MMRV) systems for long-term engagement ✓ Peer-to-peer learning ✓ Networking opportunities ✓ Knowledge sharing	**External innovation** ✓ Methane-abatement research groups ✓ Funding novel solutions ✓ Pilot testing with suppliers ✓ Expansion of innovative business practices across supply chain **Internal business and product innovation** ✓ Innovation on insetting and other types of novel financing ✓ Increasing dairy product shelf life ✓ Reformulated and diverse products	**Policy advocacy** ✓ Public support of legislation/ policies ✓ Engagement with politicians/ political groups **Stakeholder alignment** ✓ Disclose industry trade group membership ✓ Audit trade groups to ensure alignment **Spend allocation** ✓ Disclose spending on political groups ✓ Fund groups supporting methane abatement

INTRODUCTION

INTRODUCTION

Background

As climate change accelerates, companies with dairy in their supply chains—from co-ops and processors to CPGs and even retailers—face rising financial risks, including supply chain disruptions, declining productivity and yields, and mounting regulatory pressures. By addressing methane emissions, these stakeholders can increase resilience in their operations and supply chains, help achieve greenhouse gas (GHG) reduction targets and other climate-related goals, get ahead of existing and emerging regulations, reduce the systemic risk of climate change, and demonstrate leadership across the livestock sector. Focusing on methane can create many beneficial outcomes for dairy companies—not only is it a crucial climate strategy, but it can also enhance economic gains and business value. Due to methane's high 20- and 100-year global warming potentials (GWPs), unabated methane emissions will continue to have an outsized impact on global climate change during this critical decade for the climate. Stakeholders with varying interests, including investors, governments, and civil society, will expect significant reductions in methane emissions as they evaluate the levers available to reduce planetary warming.

Strategies and actions to mitigate dairy methane are complex and nuanced and thus require cross-value chain and sector-wide collaboration. By collectively working together, farmers, co-ops, processors, CPGs, retailers, researchers, policymakers, and other external stakeholders can share knowledge and create a network of support and resources focused on strategies for methane reduction. Joining such collaborative groups can also help build trust with downstream customers and create alignment on various measurement, monitoring, reporting, and verification (MMRV) approaches. Encouraging dairy companies to work collaboratively with value chain partners and peers on methane reduction initiatives rather than in silos helps facilitate the progress needed to drive industry-wide change.

Engaging diverse stakeholders throughout the dairy sector is critical to effectively reducing dairy methane across each of the strategies that drive dairy methane reductions: farmer and supplier engagement, innovation, and public policy and advocacy. Direct engagement with farmers and suppliers is necessary to promote on-farm adoption of ready-to-deploy methane solutions. Research and innovation will help improve upon existing solutions and accelerate the development of emerging ones. Beneficial public policies and programs bolster both approaches by developing the regulatory framework to address methane, providing additional financial support for adopting low-methane solutions, and complementing private-sector actions, research, and innovation activities. Companies can work on projects across different strategies in tandem to ensure they are not only acting on methane now but also investing in future, more substantial methane mitigation technologies, projects, and policies.

Climate transition action plans (CTAPs) are critical tools for disclosing emissions and reduction goals and defining the strategies and action items needed to address the business risks of climate change. Targeted plans to address emissions hotspots, such as dairy methane action plans, should support broader climate strategies and CTAPs.

The Dairy Methane Action Alliance Dairy Methane Action Plan (DMAP): A guide to planning and disclosing actions to reduce dairy methane emissions details best practices for how companies can develop DMAPs to articulate and disclose programs and projects to reduce dairy methane emissions in the near term. DMAPs provide a comprehensive and transparent view of climate actions, thus

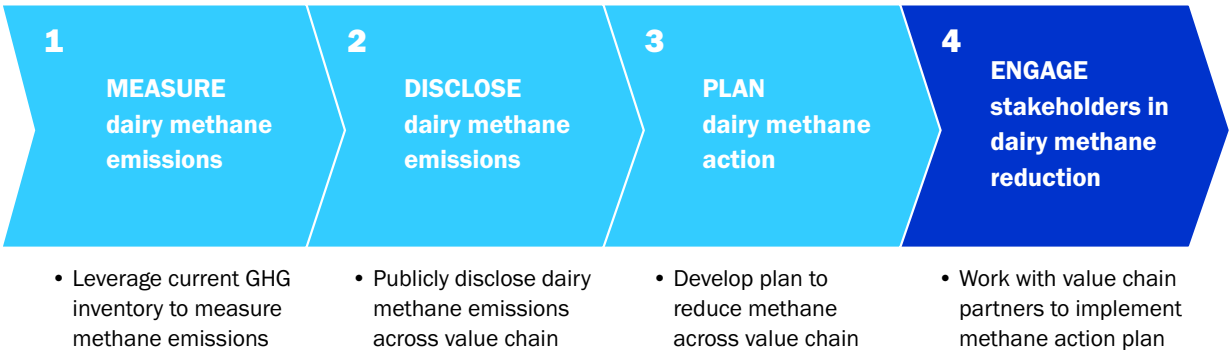
underscoring methane mitigation as an industry priority. Publicly disclosing plans to reduce dairy methane also sends signals in the marketplace that this is a priority across the dairy landscape. Since there are many potential ways for a dairy company to operationalize a DMAP, this guide outlines best practices for advancing meaningful action through stakeholder engagement.

Purpose of the guide

This guide aims to assist dairy sector companies in operationalizing the work outlined in their DMAPs by translating key milestones into specific types of engagements with suppliers and other stakeholders. This stakeholder engagement guide includes the following:

- An overview of key stakeholders and engagement activities by strategy:
  - Farmer and supplier engagement
  - Innovation
  - Public policy and advocacy
- Industry case studies that highlight successful stakeholder engagement and collaboration
- A discussion of how companies can work to collaborate on dairy methane and a list of existing dairy methane stakeholder engagement initiatives, resources, and tools that can support this work
- A list of key considerations companies can reflect on when engaging stakeholders across each of the three strategies highlighted in this guide

FIGURE 1
Dairy Methane Action Alliance (DMAA) initiative trajectory



Stage 1 of the DMAA initiative outlines how dairy sector companies can measure their methane emissions and Stage 2 identifies best practices for publicly disclosing these emissions. Stage 3 provides a framework for developing a DMAP that outlines the steps a company will take to achieve methane emissions reductions and make progress in the near term (five to 10 years). This fourth and final stage of the DMAA initiative aims to help companies implement the actions published in their DMAPs by engaging stakeholders across the value chain on dairy methane reduction efforts.

STAKEHOLDER ENGAGEMENT

STAKEHOLDER ENGAGEMENT

Collaboration is essential to tackling dairy methane emissions head-on. Companies must engage with and seek the support of internal and external stakeholders to implement the plans outlined in their DMAPs and reduce methane emissions across the dairy sector. The subsequent sections of the guide highlight different mechanisms companies can use to inform and educate stakeholders about methane mitigation, build supplier capability and capacity, develop procurement strategies, implement a product innovation pipeline, spur innovation across the industry, and align on and implement advocacy activities. Importantly, the engagement opportunities and examples presented are meant to inform possible programs, projects, and initiatives rather than prescribe specific actions. Stakeholder engagement across the three strategies of farmer and supplier engagement, innovation, and public policy advocacy will look different for each company based on position in the value chain, structure, geography, size, and other factors.

Farmer and supplier engagement

Engaging across the dairy value chain

Effective farmer and supplier engagement often requires engaging a host of stakeholders beyond just upstream producers. Therefore, while this strategy is labeled as "Farmer and supplier engagement," the actions outlined in this section involve stakeholders throughout the value chain, beyond just at the farm level. This includes retailer customers, partner organizations, and other downstream or external stakeholders, as collaboration and co-investment across the value chain is essential for spurring farm-level action.

Before engaging with upstream actors, companies can work to understand their methane hotspots by farm activity (e.g., enteric emissions, manure management), geography, business unit, supplier, products, or other segmentations. Understanding methane hotspots across the business, as well as supplier willingness to participate, will help determine where to focus efforts and which suppliers to prioritize with this work. The previous guides developed as part of the DMAA initiative outline how to account for and disclose company-wide methane emissions and plan reductions for dairy methane hotspots.

Since dairy methane is mainly emitted at the farm level from enteric fermentation and manure management, engaging dairy farmers is critical to companies achieving their methane reduction targets.

Dairy-sourcing companies can engage directly with farmers or through value chain partners such as co-ops, processors, or other suppliers.

In some limited cases, companies purchase milk from a segregated or direct supply chain where they work directly with farmers. More often, companies purchase dairy from a pooled milk supply through dairy co-ops that, in turn, work more directly with dairy farmers. As such, many CPGs or other downstream actors do not have the ability or capacity to work directly with dairy farmers to support or implement methane reduction. Instead, these companies may leverage dairy co-ops to reach farmers at scale. While the types of farmer engagements remain relatively consistent regardless of which stakeholder administers them, how programs and projects are structured may look different based on how milk is sourced.

Dairy value chain partnerships to achieve farm-level GHG reductions

Dairy co-ops represent the interests of farmer member-owners and provide services such as price negotiation, transport, processing, and marketing of milk and dairy products. Given the role of co-ops as centralized hubs to reach many dairy farmers, co-ops may be well-suited to help milk buyers (i.e., food and beverage companies and other downstream actors) administer farmer programs, including capacity building and technical support, financial investment and incentive, and data gathering and networking programs. Co-ops can also drive collective action and scale methane solutions across many dairy farms, such as implementing local manure management solutions like anaerobic digestors or solid-liquid separators. Serving as an intermediary between farmers and downstream customers can allow co-ops to more fairly select program participants and distribute program benefits. Programs managed by co-ops can help ensure all farmers have equal access to incentives, regardless of size or GHG footprint. Dairy co-ops can also support the development of next-generation methane-abating technologies and advocate for climate action at the policy level.

In addition to working with co-ops to support farm-level methane-reduction programs, CPG companies can partner with other milk buyers and downstream customers, including retailers and restaurants, to advance practice and technology adoption on farms. Specifically, companies with shared suppliers can collaborate to finance these on-farm programs and practices. Co-investing in methane reduction projects not only distributes the financial investment across multiple companies but can also allow downstream companies to share the upstream GHG reductions that result from their investment. Other stakeholders, such as NGOs, MMRV providers, and farmer organizations, can help implement and validate these projects to ensure efficacy, equity, and impact.

Because partnerships and collaboration can take many forms, companies can explore how, when, and with whom to partner to help ensure methane reduction initiatives reach farmers, achieve desired outcomes, and are cost-effective.

BOX 1

Stakeholder partnerships to drive farm-level climate action and methane reduction

Partnerships between dairy sector stakeholders and value chain actors are essential to reducing methane at the farm level. The examples below highlight different types of partnerships between diverse stakeholder groups that focus on increasing the adoption of on-farm methane reduction programs.

Co-op, downstream customer, and nonprofit partnerships: Maryland and Virginia Milk Producers Cooperative Association, a milk co-op based in the mid-Atlantic and Southeastern U.S., worked with the nonprofit Alliance for the Chesapeake Bay to develop partnerships with customers across the dairy value chain. Partnerships with ice cream and beverage manufacturer Turkey Hill, grocery chain Giant Food Stores, and coffee shop chain Starbucks promote on-farm sustainability best practices to reduce the carbon footprint of milk production and improve water quality. These partnerships provide co-op member farms access to cost-sharing opportunities, direct funding, and government grant programs.

Food manufacturer, retailer, and nonprofit partnership: Grocery chain parent company Ahold Delhaize USA and food manufacturer General Mills have co-invested in a project to accelerate regenerative agriculture practices across 70,000 acres of farmland in Kansas, United States, and Saskatchewan, Canada. The scale of this project represents the approximate area of land needed to produce all General Mills products sold in Ahold Delhaize USA stores. The project locations were chosen because Kansas and Saskatchewan are important supply sheds where General Mills sources key commodities. The Ecosystem Services Market Consortium, a nonprofit that connects farmers with companies to invest in sustainable agriculture, will facilitate the program and oversee impact measurement.

Though this partnership is not dairy-specific, it showcases an innovative partnership model where downstream CPG companies and retailers can co-invest in on-farm practices and co-claim GHG reductions, even when directly engaging with upstream farmers can be challenging.

Solutions provider and co-op partnerships: dsm-firmenich, a company active in nutrition and health, has partnered with many global dairy co-ops and agricultural companies to pilot Bovaer®, an enteric methane-reducing feed additive. Partnerships included on-farm testing to gain practical experience using Bovaer® with FrieslandCampina and Arla in Europe and Fonterra in New Zealand. dsm-firmenich estimates that over 280,000 tons of CO_2e have already been avoided through the use of Bovaer®.

Opportunities and challenges with farmer and supplier engagement

Farmer and supplier engagement on dairy methane can provide many benefits in addition to emissions reductions. Since farmers are often far upstream on the dairy value chain, engaging with farmers, co-ops, and suppliers can help build long-term business relationships and mitigate supply chain risks for all parties. Investing in and working with dairy farmers and suppliers on climate actions also demonstrates industry leadership and sends the market signals that collaborating and progressing on this work is a top business priority. Additionally, engaging suppliers in collecting farm-level data and implementing decarbonization solutions can help dairy-sourcing companies comply with applicable regulations, such as the European Regulation on Deforestation-Free Products.

Farmers also benefit from collaborating on climate mitigation activities with their downstream customers. Working on methane mitigation initiatives such as farm-level data collection, regulatory compliance, on-farm practice adoption, and other actions can help dairy value chain actors meet their targets, putting farmers in

good standing with downstream customers for future business opportunities. Farmers can also earn financial support and build environmental resilience by implementing methane mitigation practices on their farms.

While engaging with upstream dairy farmers on methane provides many opportunities, doing so also comes with its own set of challenges for downstream processors, distributors, and retailers. These challenges include managing business relationships between distant nodes of the dairy value chain, addressing and mitigating farmer risks, and building trust between producers and customers.

Multiple intermediaries may exist between a dairy farmer and a downstream dairy manufacturer or retailer, such as co-ops, distributors, or other processors. These complex supply chains create distance between producer and customer, limiting traceability and hindering downstream actors from reaching and collaborating with their upstream producers. Companies can bridge this distance by engaging with farmers, co-ops, and other customers along the value chain on methane reduction. Encouraging intermediaries to commit to GHG reduction targets can create a trickle-down effect where all upstream value chain actors are mutually interested in decarbonizing their dairy operations.

Many dairy farms are family-owned, meaning the farm is a source of income for multiple members of a single family. Dairy farming is also a relatively low-margin and time-consuming business that leaves farmers with little capacity to learn about, develop, and implement other work not directly related to the financial success of their farms. For these reasons, many farmers can be risk-averse to changing management practices or implementing new technologies. Dairy farmers may only have the cash flow to adopt new technology or practices once they have been proven to be successful. When engaging farmers in methane reduction initiatives, it is crucial that companies and intermediaries structure programs and projects to address and mitigate farmer risks by providing them with adequate technical and financial support based on their specific circumstances. Because farm-level data is needed to implement many methane reduction initiatives, it is also important to ensure that the systems and tools used are user-friendly and minimize any administrative burdens on the farmer.

Building trust between a dairy farmer and a downstream customer is essential to gaining farmer buy-in for on-farm initiatives. Since farmers regularly engage with trusted technical advisors, peers, and groups to share knowledge, companies looking to engage with their suppliers on dairy methane can work through these existing channels to establish trust. Working with co-ops, processors, or industry organizations to unite around a common "ask" can help dairy-sourcing companies gain credibility with their upstream farmers. Working towards long-term support and solutions are helpful for trust building, as annual contracts often hinder the lasting adoption of reduction initiatives, particularly during a transition period. Companies can establish trust by implementing well-designed programs that adequately consider farmer risk, incentivize practice adoption, and focus on long-term partnerships to effectively address methane emissions.

Modes of farm-level engagement

This section outlines three ways downstream dairy buyers can break down these barriers and work collaboratively with their upstream dairy suppliers. While this guide presents each engagement category separately, these farmer and supplier engagement and incentive opportunities are most successful when bundled through ongoing farmer support programs or initiatives that integrate many elements of these engagement opportunities. They do not need to be siloed by an individual intervention. Further, because stakeholders must operate within the ever-evolving landscape of solutions that are currently available in the marketplace, companies should aim to roll out available solutions while still supporting the development of nascent ones and the capacity to integrate them down the road.

- **Capacity building and technical support** include utilizing pilot and demonstration farms to showcase best practices, providing access to or offering technical assistance via technical advisors, conducting group workshops, providing one-on-one mentorship, and distributing educational materials such as fact sheets, webinars, and online courses. This work not only includes offering farmers direct support but also investing in building capacity for local or regional groups, such as farmer and technical advisor groups and co-op field staff, to provide this support.

- **Financial investments and incentives** provide direct financial support through premiums, future business, loans, grants, subsidies, and rewards. Companies may also indirectly invest in this work by funding projects via nonprofits, academic institutions, or even their own foundations. Co-investing in projects with peers or value chain partners can also help scale this work across many farms.

- **Data gathering and networking** include using streamlined platforms for data collection, benchmarking, and sharing best practices as well as facilitating networking events and discussion groups for peer learning among farmers.

Though the DMAA initiative is focused on dairy methane, these three modes of engagement can be used to collaborate with suppliers on different sustainable agriculture practices across many supply chains. Most of the case studies presented in this guide demonstrate successful collaboration on dairy methane, and some examples showcase emissions reductions for other commodities or sustainability actions.

Capacity building and technical support

Helping farmers develop the technical know-how to implement methane-reducing practices is essential to getting these projects off the ground. Specific activities include offering farmers technical assistance and training programs and courses and trialing/piloting sustainable farming practices.

Farm-level climate plans

Just like companies should use CTAPs and DMAPs to plan their climate change and methane-specific mitigation activities, dairy farmers should be supported to develop comprehensive climate plans before adopting new practices or technology. Climate farm plans are whole-farm approaches to reducing GHG emissions and increasing soil carbon sequestration on working lands.[7] Data-driven, context-specific climate plans can enable farmers to invest in strategic whole-farm practices that consider their overarching farm goals. One example of a tool that helps farmers to develop farm-level climate plans is FARM ES 3.0, which transitioned to a whole-farm approach using the process-based RuFaS model in 2024. Comprehensive carbon plans can:

- ✓ Identify holistic short- and long-term actions, including programs, projects, and practices, to implement on the farm.
- ✓ Assess and acknowledge possible tradeoffs with other environmental resources and impacts (e.g., water consumption, eutrophication, biodiversity).
- ✓ Balance or limit contradictory advice (e.g., conflicting guidance on nutrient management plans).
- ✓ Address local environmental regulations.
- ✓ Assess farmer goals and economics.
- ✓ Adaptively manage the farm over time.

Technical assistance

Offering or connecting farmers to existing technical assistance programs includes providing access to direct support, knowledge, and tools they need to implement methane-reducing projects across their dairy farms. Examples of technical assistance include providing agronomic support via technical experts and helping farmers develop tailored plans and approaches to methane reduction activities based on their farm characteristics (e.g., geography, farm size, farm type).

Bringing technical advisors who work with farmers (e.g., nutritionists, feed advisers, co-op field staff, veterinarians, agronomists) on board with methane-mitigating practices is vital to gaining farmer buy-in and ensuring practices are implemented correctly. In addition to farmer training, companies can support the development and/or dissemination of technical resources or offer "train-the-trainer" programs to ensure advisors are up-to-speed on these practices. Dairy Management Inc.'s (DMI) Dairy Conservation Navigator provides key information on a range of conservation practices and technologies, geared specifically toward farmer and farmer advisor audiences. Bringing trusted advisors into this work can help scale technical support networks and technology and practice adoption, as well as ensure program longevity within farming communities.

Companies can consider the following when offering or connecting farmers to existing technical assistance and support:

- Technical assistance is only useful when tailored to the local geography, farmer needs, and farm type and size. Since manure separators, for example, are most applicable to medium- and large-sized farms, providing smallholder farmers technical assistance on this type of manure management system would not be particularly useful.
- Farmers need time to adapt to new management practices, such as manure management or ration optimization, before full implementation since new farming techniques often take time to perfect.
- Sharing lessons with farmers from previous efforts or other farmers can increase project uptake.
- Companies should consider what makes partner organizations well suited to provide farmers with technical assistance.

Training programs and courses

Training programs and courses are the more generalized educational resources that help farmers adopt sustainability practices and often go hand-in-hand with technical assistance. Training programs and courses provide context, which can help increase farmer adoption of methane reduction projects. Dairy-sourcing companies can offer or provide access to training programs and courses via company-developed online platforms or through existing academic institutions, government agencies, or other organizations. Examples of training programs and courses ranging in topic, comprehensiveness, format, and cost, include Ireland's Agriculture and Food Development Authority (Teagasc) Dairy Herd Management courses, Agriculture and Horticulture Development Board EuroDairy resource efficiency webinars, Agriculture and Rural Advisory System Vocational Education and Training In Agriculture courses, National Dairy FARM Program resource library, and Cornell College of Agriculture and Life Sciences PRO-DAIRY courses.

Companies can consider the following when offering farmer training programs and courses:

- Publicly available or open-source training courses (on corporate websites or sustainability pages) benefit both company suppliers and other farmers in the dairy sector who are working to reduce methane emissions.

- Choosing the right partners to deliver training courses is also critical to the success of programs. Farmers often get information from trusted sources, including veterinarians, feed suppliers, co-ops, extension agents, land grant academic institutions, and government agencies. Engaging the right partners to reach farmers can go a long way in establishing trust, building the business case for this work, and funding or subsidizing educational courses.
- Training opportunities can also include companies helping farmer partners learn to identify and secure funding opportunities. For example, companies can help farmers access government and other types of funding, such as EU innovation funding through the Common Agricultural Policy (CAP) Network and EIT Food, U.S. Farm Bill conservation funding via EQIP and CSP, and other programs or sources.
- Companies can collaborate with value chain partners to provide large-scale training for shared suppliers.

BOX 2

Smallholder farmer training

Smallholder dairy farmers play a critical role in supporting rural communities through financial and food and nutrition security.[1] However, they often face challenges such as low productivity and thus low milk prices; lack of access to quality feed and forage, adequate rural infrastructure, and institutional financing; and poor animal genetics, care facilities, and extension services.[2]

To address some of these challenges, food and beverage companies can develop training programs that cater to smallholder dairy farmers. Holistic programs that cover social, economic, and environmental training can help improve livelihoods, build local markets, secure supply for future generations, reduce the environmental impact of local dairy farming, and support more equitable and resilient dairy farming.

The Danone Ecosystem Fund works with the business across various geographies that include smallholder farmers. Launched in 2011, the Margarita project, for example, has helped smallholder dairy farmers in Mexico overcome challenges such as insufficient access to markets, poor milk quality, inadequate infrastructure and financing, challenges keeping up with best practices, and lack of business training. After enrolling in the program, farmers received comprehensive support, including:

- ✓ Training on animal care and regenerative agricultural practices
- ✓ Financing from government sources, credit services, and for supplies and procurement
- ✓ Technical support, including a monitoring system and connected cow collars
- ✓ Access to milk collection, transportation and distribution, processing, and markets

Program participation offered farmers enhanced growth, greater autonomy, increased productivity and financial security, and improved business skills, which enabled them to reinvest back into the farm to further improve their livelihoods. As of 2024, the Margarita project achieved the following impacts, according to Danone:

- ✓ €16.17 million in funding
- ✓ 13% reduction in participant GHG emissions from 2018 to 2020
- ✓ 100% of farms assessed for animal welfare
- ✓ +1,000 small-scale producers empowered

Pilot projects

Trialing different farm management practices and technologies includes selecting the appropriate region, farm, and supplier; collecting data; implementing the project; reviewing results; and sharing lessons learned to effectively scale the solution(s) across the value chain. Pilot projects can help companies learn about the viability, effectiveness, and reception of specific mitigation practices, guide how to best engage with farmers in this work, and understand which financial incentives are most efficient. When implementing pilots, it is important for companies to listen to farmers about what is working and what is not working, not only to best implement this work, but also to continue to build trust.

Piloting methane interventions on working farms can provide many benefits, which include:

- Using successes and failures from the pilot to scale the solution across other farms
- Lowering farmers' perceived risk of implementing methane mitigation practices and catalyzing other climate-smart agricultural practices
- Motivating neighboring farms to implement similar practices (e.g., via demonstration farm open days)
- Building and strengthening relationships between companies and the farmers from which they source
- Learning context-specific modes of farmer engagement
- Gaining insight on more than just environmental outcomes, including technical implementation, animal welfare, productivity, timing, and other factors
- Understanding the financial bottlenecks preventing farmers from measuring adoption

BOX 3

Case study: Kerry Group's Evolve Dairy Sustainability Programme

Launched in 2022, Kerry Group's Evolve Dairy Sustainability Programme is a science-backed program that incentivizes dairy farmers to reduce emissions and ammonia, improve grazing practices and water quality, increase biodiversity, and enhance animal welfare. As part of Evolve, farmers receive resources, training, and cost-sharing incentives to implement specific on-farm actions to progress these environmental and animal welfare aims. Farmers are provided educational resources such as a booklet and resources on biodiversity, soil management, herd production, animal health, and knowledge transfer. Kerry Group offers milk suppliers outcomes-based cost-sharing incentives for specific actions and flexible and competitively priced loan funding based on accelerated adoption of science-based sustainable actions and best practices.

A specific pillar of Evolve includes grazing management. Since higher-quality diets reduce enteric methane and improve milk yields, Kerry Group offers farmers €173 for every extra tonne of grass dry matter grown and utilized. Key actions required from farmers include conducting weekly pasture assessments to support decision-making, improving grazing infrastructure, and implementing a robust reseeding policy.

The Evolve program is underpinned by the Teagasc Marginal Abatement Cost Curve, which is geographically specific to Irish Agriculture, demonstrating Kerry Group's geography-tailored and context-specific intervention planning. Additionally, Evolve combines elements of farmer technical support, training, and financial incentives into a holistic farmer engagement program.

Financial investments and incentives

Even with robust training and technical assistance, financing can be a significant obstacle for farmers in adopting sustainable solutions to meet customer demands. Offering farmers financial support through loans and grants, discounts and subsidies, premiums, future business, favorable contracts, and procurement policies can narrow the gap and make these practices more feasible. Many interventions, such as changes in feed (including additives) or manure management improvements (e.g., anaerobic digesters), require upfront capital expenses, long-term operating expenses, or both. The upfront and ongoing costs can make these solutions cost-prohibitive and may discourage farmer adoption. By collaborating with food and beverage companies, dairy farmers can access favorable financing options, such as low-interest loans and grants, leading to climate benefits, risk mitigation, and future business opportunities for farmers and food and beverage companies. Companies can also combine financial assistance with training to further empower farmers to embrace methane-reducing practices.

The financing mechanisms presented in this guide are needed to stimulate the adoption of practices and technologies in the near term. While some of these mechanisms may be geared toward short term implementation or tied to specific projects, in the long term, the dairy industry has the opportunity to develop system-wide financing solutions for this work. Additional innovation is still needed to create more systemic solutions in the marketplace to ensure the longevity of methane action.

Loans and grants

Farmers may hesitate to invest in methane-reducing projects due to high upfront costs. Downstream companies may offer loans or grants to their upstream dairy farmers to alleviate these costs and encourage investment in long-term methane projects. Loans or grants may cover expenses related to equipment, feed, seed, and other supplies or improvements. Loans, grants, and capital investments can take many forms. Companies can partner with banks, offer preferential borrowing rates, cover administrative costs, allow borrowing without guarantees, provide grants for products and technical services, require action plans for loan or grant eligibility, and offer loan guarantees to farmers for implementing methane-abating technology. While companies may be the source of this financial support, they may also help their suppliers access opportunities offered by non-profits, NGOs, and governments.

BOX 4

Case study: Public-private partnerships to leverage US public resources

In the U.S., Danone has built public-private partnerships that allow for co-funding projects at scale. These projects will direct funding to dairies to reduce methane emissions through improved manure management practices, such as liquid-solid separators, which can reduce methane emissions by 25-35%. For the initiative, Danone will be directly engaging dairy farmers in its supply chain across various regions of the U.S.

Discounts and subsidies

With discounts and subsidies, companies provide reduced-cost inputs and technology or initial funding to farmers to demonstrate the benefits of adopting methane-reducing practices. Examples include providing discounted forage for diet optimization, offering technical assistance, and subsidizing the cost of other ongoing projects. Discounts and subsidies can lead to ongoing methane reduction projects beyond just initial investments, helping to scale this work.

Premiums and future business

Any new practice is a risk to a farmer when implementing it for the first time. New farming techniques may take time to perfect, initially affect yields, or require more time and labor. Companies can offer their suppliers price supports, premiums, favorable contracts, or other business incentives for adopting new interventions, which can help derisk new practices. Different types of premiums include companies investing in projects that train farmers cost-free, providing "pay for performance" incentives for outcomes-based results, supporting farmers testing and trialing new practices, and guaranteeing future contracts or business for implementing practices. Companies committing to source a certain amount of dairy across a certain period can help derisk practice implementation. Bundling financial premiums with free training can help flatten the learning curve and accelerate environmental benefits.

Carbon insetting

Carbon insetting is a mechanism that aims to reduce emissions within a company's supply chain. Insetting engages farmers and pays them to implement sustainable practices and validates climate- and nature-related outcomes like reductions and sequestration via MMRV. Payments can include premiums, discounts, or other types of financing. By insetting, companies can claim these carbon reductions within their corporate GHG emissions inventories to achieve their near- and long-term targets. This collective financing strategy allows downstream companies to finance farm-level practice and technology adoption, even if the companies do not engage directly with farmers. Scope 3 GHG accounting rules require that all downstream customers account for the emissions from producing the raw agricultural commodities they source. These rules enable multiple downstream customers, such as food manufacturers and retailers, to co-invest in on-farm projects and share reduction claims. Carbon insetting has the potential to provide a robust financing structure for methane reduction practices.

Additional resources on carbon insetting and accounting and claiming rules:

- ✓ International Platform for Insetting (IPI)
- ✓ Gold Standard Value Change Initiative (VCI)
- ✓ Science Based Targets initiative Forest, Land and Agriculture Guidance (SBTi FLAG)
- ✓ GHG Protocol Land Sector and Removals guidance (GHG LSRG)

BOX 5

Case study: Arla's FarmAhead™ Incentive program

Arla's FarmAhead™ Incentive is designed to support and reward dairy farmers for implementing climate and other environmental sustainability programs and projects. The points-based system rewards farmers for implementing actions in the areas of efficiency, input use, land use, animal health, feed monitoring, sustainable feed, biodiversity and carbon farming, manure handling, renewable energy, knowledge building, and farm planning. Points are distributed relative to the potential impact of the activity and validated using Arla's FarmAhead™ Check tool. Arla then pays farmers €0.03 per kilo of milk purchased for each point earned, plus an additional €0.01 per kilo for participating in the annual climate check. Farmers can currently earn up to 80 points, but as farm-level innovation evolves, Arla plans to update the model.

Data gathering and networking

Sharing information with and collecting data from farmers, implementing robust MMRV systems, and tracking and validating on-farm methane reductions are essential to engaging farmers in on-farm practice adoption. Online portals and platforms can facilitate virtual information sharing and offer numerous benefits, mirroring the advantages of face-to-face networking and peer learning. These platforms facilitate the exchange of techniques and practices and serve as a channel for companies to

disseminate information to many farmers. Additionally, they can enable data logging, return on investment calculation, real-time data sharing with customer companies, and the MMRV of climate and other environmental benefits.

Enabling farmers to engage with and educate one another can further amplify the impact of training, financial support, and other incentive programs. Farmer networks can unlock the opportunity to transform the knowledge of individual farmers into a valuable resource for the larger farming community. Collaborative regional discussion groups and cohorts can create a robust environment for sharing ideas and skills.

Data collection and analysis

Farmers and downstream dairy companies need accurate and comprehensive data to evaluate the success of on-farm programs, help with decision-making, optimize farming practices for methane reduction, and track emissions impact. High-quality data can help scale successful pilots with few farmers to larger areas and a broader supply base, as well as enable companies to track their own GHG impact at the farm, sourcing region, or supply shed level. Leveraging and sharing data insights through demonstration farms and workshops can promote peer-to-peer learning, accelerate the adoption of best practices across the wider farming community, and further connect customers to their farmers and suppliers.

Peer-to-peer learning

When designing a farmer engagement program, companies and their on-the-ground technical partners can explore opportunities to embed peer-to-peer learning and networking. Farmer training and practice- and outcome-tracking programs that include peer-to-peer learning and networking opportunities can often be more successful because farmers can collaborate to solve problems and learn from program successes and challenges. Peer networks and cohorts add a social dimension to sustainability programs, making them more appealing to farmers and encouraging discussions that can result in innovative ideas, learning opportunities, and utilization of networks to spread and troubleshoot new practices.

Shared networks and support

Networking opportunities are another way farmers can learn about how others have implemented methane-reducing practices and how they can implement them on their own farms. Dairy companies can incentivize peer-to-peer farmer learning by building networking into their farmer engagement programs. This can include rewarding farmers via subsidies or other benefits for attending events and conferences to encourage participation. Offsetting some of the costs of attending these events can encourage farmers to participate, bring new techniques back to their farms and ranches, and share information with their farming communities.

BOX 6

Case study: The U.S. Dairy Sustainability Alliance

The U.S. Dairy Sustainability Alliance, founded by the Innovation Center for U.S. Dairy, is a multi-stakeholder group developed to share knowledge, collaborate on issues affecting the industry at large, accelerate progress toward common sustainability goals, and contribute to the long-term viability of the U.S. dairy industry. The Alliance hosts in-person meetings, virtual webinars, events, and working groups, and produces newsletters and other member resources that elevate farmer voices, facilitate knowledge sharing, and connect farmers to peers and other value chain partners. Members represent actors from across the dairy value chain including farmers, cooperatives, processors, industry suppliers, food service and retail, government, dairy checkoff, civil society, agricultural groups, and others.

Innovation

Given the current gap in commercially available methane abatement solutions, supplier and farmer engagement alone cannot meet the emissions reductions needed to minimize the impacts of climate change. Existing methane mitigation solutions must become more widely available and affordable, and new technologies and solutions must be developed to increase the scale and scope of methane reductions. At the same time, the MMRV systems for both existing and novel solutions must be able to validate and track methane reductions. Through innovation, dairy sector stakeholders can facilitate wider adoption of existing solutions and unlock novel and emerging solutions that companies can, eventually, integrate within their supplier engagement programs.

Dairy-sourcing companies have two distinct pathways to drive methane reductions through innovation:

- **External innovation** to support the adoption, development, and MMRV of existing and next-generation methane-abating technologies
- **Internal business innovation** to adopt business policies, practices, and partnerships that prioritize methane reduction and develop products with a lower methane impact

A company's stakeholder engagement work will differ depending on whether the innovation strategy is focused internally and/or externally.

External innovation

Companies can engage with external stakeholders in many ways to propel the development and use of both existing and novel methane reduction solutions. The DMAA DMAP guide identifies methane mitigation solutions that are either not yet commercially available or are emerging technologies currently in early research stages. The type of engagement required for each solution will depend on where it stands on research and development (R&D) progress. Novel solutions that have recently become commercially available, such as certain feed additivies, may still require on-farm pilots to assess feasibility, validate reductions, and understand implementation best practices prior to deployment across a company's wider supply chain. In contrast, early-stage solutions that are still under scrutiny for animal and product/consumer safety (e.g., feed additives such as seaweed) or that have yet to be tested for efficacy (e.g., some manure additives) may be best supported through funding.

Methane abatement research groups, private companies developing novel technologies, and key suppliers for piloting and implementing solutions are all critical stakeholders for companies to engage when working toward external innovation. While external innovation is a long-term strategy, a commitment to innovation shows leadership in the dairy industry, paving the way for future technologies to scale methane reductions.

Methane-abatement research groups

Methane-abatement research groups help fund novel methane research and bring together like-minded stakeholders, keeping them informed on the latest methane-abatement technologies in the dairy

industry. Groups such as the Global Methane Hub (GMH) and the Global Methane Initiative (GMI) focus more broadly on global methane reductions, with a targeted sectoral focus on agricultural methane. The GMH Enteric Fermentation R&D Accelerator is an example of a targeted agricultural methane program. The Greener Cattle Initiative, established by the Foundation for Food & Agriculture Research (FFAR) and the Innovation Center for U.S. Dairy, in collaboration with eight other organizations, focuses their research on emissions reduction strategies within the beef and dairy industries. Companies can also explore partnerships with extension programs and university research groups. The University of Wisconsin's Dairy Innovation Hub, research groups under Cornell's College of Agriculture and Life Sciences, and Wageningen University & Research (WUR) Low Carbon Dairy public-private partnership in the Netherlands are just a few examples of different academic research groups focused on dairy emissions. Based on the research group's organizational structure, companies can engage with these groups through membership, funding, or knowledge sharing. Further information on these methane-abatement research groups and others can be found in the cross-sector and value chain collaboration section.

BOX 7

Case study: Wageningen University & Research Low Carbon Dairy public and private partnership

Companies have recognized university research groups as important partners in developing and testing methane-abatement solutions. Unilever and Nestlé have partnered with WUR in the Netherlands to develop a Low Carbon Dairy program aimed to reduce emissions 50% by 2030. The primary research activities in this program include:

- ✓ Developing reduction plans for individual dairy farms
- ✓ Analyzing the costs, benefits, and trade-offs of a 50% reduction in emissions
- ✓ Developing tools for creating appropriate emissions reduction plans and MMRV solutions for farmers
- ✓ Compiling learnings from partner farms on emissions reduction solutions, implementation, and MMRV
- ✓ International exchange of knowledge and results

Through this program, WUR is also partnering with dairy compound feed companies Agrifirm, ForFarmers, and De Heus; agricultural suppliers Duynie and Lely; and financial institution Rabobank.

Private companies

Dairy-sourcing companies can also directly invest in or partner with private companies developing technologies for methane reduction. By investing in solutions prioritized in their DMAPs, dairy-sourcing companies and those developing next-generation methane-reducing solutions can form strategic partnerships to accelerate progress at the company level and across the dairy industry. The DMAA DMAP guide outlines a list of emerging technologies and companies working in this space for companies to explore.[a] Many private companies are working toward enteric emissions reductions via feed additives and supplements, breeding and genetics, methane capture, and vaccines, as well as alternative manure management structures, devices, and additives. In addition to investing or partnering with companies developing more novel solutions, it is also important to bolster existing technologies to increase availability and lower development costs for these technologies.

BOX 8

Supplier engagement on innovation

A company's methane mitigation actions may not fall squarely into one of the three strategies outlined in this guide — farmer and supplier engagement, innovation, or public policy. Many actions will likely cross one or more of these strategies. For example, engaging with suppliers is critical to facilitating the adoption of innovative methane-mitigating solutions.

Once solutions become commercially available, companies must test these on working farms to ensure they are feasible and scalable before integrating them across their supply chains. The local regulatory body must first approve these technologies before commercial use. Developing the MMRV structure of existing and new solutions is also important to confirm reductions are effective and verifiable over time. Once commercially available, testing solutions can help ease the implementation burden and prepare suppliers based on the successes and challenges learned during the pilot phase. While a company may want to prioritize working with existing or new suppliers already focused on methane reduction, this may not always be possible due to the geographic location of farms and supply chains, supplier relationships, or other constraints. To help increase the supply base of farmers engaged in methane mitigation, downstream dairy actors can encourage and incentivize farmers—existing suppliers or otherwise—still early in their methane-reduction journeys to adopt methane-reducing practices. Engaging with suppliers on sourcing commitments both during and after implementing innovative practices can be used to lower the adoption risk. See the farmer and supplier engagement section for additional information on implementing pilot projects.

[a] EDF does not endorse specific solutions or the research associated with each solution. These are included in the DMAA DMAP guide to demonstrate the breadth of solutions in development.

BOX 9

Case study: Danone's work on external innovation

Danone has a robust external innovation strategy that focusses on all three stakeholder engagement activities:

Methane abatement research groups: Global Methane Hub (GMH) launched its Enteric Fermentation R&D Accelerator at COP28. Danone was the first corporation that committed to funding the accelerator, demonstrating its leadership and commitment to prioritizing dairy methane reductions. The Accelerator has pledged to invest at least $200 million in developing and implementing practical solutions aimed at reducing methane emissions by 30% by 2030. This commitment aims to foster new, scalable, and practical solutions to help dairy farmers significantly reduce methane emissions.

In August of 2024, GMH released the Accelerator's research strategy to advance breakthroughs in livestock methane mitigation by 2030. The research strategy identifies key areas that have the greatest potential to accelerate progress in methane abatement, including genetics, vaccines, and anti-methanogenic feedstuffs. Research areas are classified by their technology readiness level and aimed at progressing research concepts into proven solutions. Components of GMH's research strategy are also focused on developing accessible and affordable methane measurement tools to progress MMRV.

Capital investments: Danone Ventures invests early in innovative companies that are bringing methane reduction solutions to the market. In 2021, it invested in ZELP (Zero Emissions Livestock Project), a novel methane capture headpiece for cattle. In 2022 Danone Ventures led the Series A funding round of Symbrosia, a startup developing a red seaweed-based feed additive, SeaGraze®.

Pilot studies: In January of 2024, Danone partnered with Cornell University and Symbrosia to demonstrate the effectiveness of SeaGraze® oil for enteric methane reduction. Symbrosia's newly developed oil extract is less resource intensive to produce and retains bioactive compounds better than its current freeze-dried SeaGraze® product. Partnerships with universities and the private companies developing methane solutions can help bring innovative solutions to market.

Internal business and product innovation

Dairy-sourcing companies can also focus their innovation strategies internally on business and product innovation. Many existing financing mechanisms presented in the farmer and supplier engagement section of this guide are meant to spur near-term adoption of on-farm methane-mitigating practices. Companies can develop and contribute to innovative financing to make methane mitigation more economically viable for dairy farmers and companies in the long term. Extending dairy product shelf life and responding to consumer demand for innovative products are also approaches companies can take to reduce their corporate GHG emissions. While DMAA focuses on reducing methane from companies' dairy value chains and existing dairy portfolios, innovating new products to meet consumer demand has the potential to reduce corporate methane footprints.

Business innovation

Internal innovation on methane is not only limited to product development but can also include novel business solutions, processes, financing, and platforms. Such practices can help bolster the business case for investing in methane-abating programs and projects to deploy solutions on a broader scale. Using an internal price on carbon or GHG emissions can help companies consider environmental outcomes in corporate decision-making. Platforms that connect companies to farmers implementing sustainability practices can help create new market opportunities for upstream suppliers while enabling downstream customers to track progress against their targets. Market instruments, such as value chain insetting, allow multiple value chain actors to share the costs and methane reductions associated with a given investment. Innovative financing models can help provide farmers with the much-needed funding to implement dairy methane solutions. Cross-sector collaboration on innovation can help drive action on dairy methane across the dairy value chain, financial institutions, governments, and NGOs.

BOX 10

Innovative business solutions to promote action on methane

Internal price on carbon/GHG emissions: Many companies have developed internal policies to assign monetary value to their GHG emissions, allowing GHGs to be factored into their internal policies and decision-making. Setting an internal price on carbon or GHG emissions incentivizes companies to reduce emissions by choosing lower impact options. In the past, Danone has instituted an internal carbon price to understand the cost of carbon emissions and help drive progress toward its GHG reduction target. It has since used various external prices of GHG emissions to consider how to prioritize investments in its agricultural supply chain.

Partnering on ecosystem services: In 2016, Land O'Lakes developed Truterra, a sustainability arm of its business that provides tools that help farmers estimate, evaluate, and develop ecosystem service credits for sale in a rapidly emerging marketplace. In 2024 Truterra launched its Dairy Soils Carbon Program that rewards dairy farmers for adopting sustainable cropping practices for dairy feed commodities. Bel Brands has partnered with Truterra Insights Engine to track crop system changes on one of their supplier's farms. This will allow farms to capture actionable data about sustainable agriculture practices and the economic impacts, helping companies meet their sustainability goals while providing market opportunities to suppliers.

Collaborative financing solutions: EDF's Financing Dairy Climate Solutions guide outlines eight different financing mechanisms for collaboration between the dairy and financial sectors to reduce GHG emissions and improve sustainability outcomes. The financing mechanisms presented in the guide include sustainability-linked loans with and without blended finance, green loans, impact funds, program-scale bridge funding, equity investment, loan guarantees, and financial solutions for enteric emission reductions.

BOX 11

Methane's wider impact on nature

While DMAA's focus is on reducing methane emissions to mitigate climate change and increase resiliency across the dairy sector, it is important to recognize the tangential impacts methane has on the wider ecosystem and the impact that nature can play in reducing a company's climate risk. Increased flooding, damaging storms, wildfires, drought, and temperature extremes negatively impact dairy farmers and companies not only in terms of financial costs, milk yields, and feed quality but also in terms of biodiversity, water availability, and other nature-related impacts.[3] Addressing climate and nature holistically can be an innovative way for companies to tackle multiple on-farm environmental impacts. Targeting methane reduction can help companies progress on emerging nature-related topics, such as science-based targets for nature, which cover water, biodiversity, and land use.

Due to methane's outsized impact on warming in the near term, prioritizing methane reductions can lower risks in dairy supply chains and increase pathways for restoring nature. In particular, sustainable manure management plays a critical role in reducing methane emissions and protecting water quality, freshwater, and marine ecosystems.[4]

Given that climate change will likely become the dominant cause of biodiversity loss in the coming decades, reducing methane both mitigates climate change as well as protects nature.[5] Innovative solutions that focus on methane reduction and conserving nature can play a key role in a company's present and future climate and nature strategies.

Product innovation

Companies must use a systems approach to understand tradeoffs between different processing methods and ingredients when reformulating or developing new products to meet consumer demand. When assessing these tradeoffs, companies should consider products' holistic social and environmental impacts rather than just using GHG emissions as an indicator. Companies should consider factors such as energy consumption, transportation distances, water consumption, deforestation, and others.

Company-wide collaboration across numerous internal stakeholders is needed to develop a methane reduction strategy around product innovation. Coordinating internal business teams, such as strategy, legal, risk management, sustainability, R&D, finance, procurement, environmental health and safety, and marketing and communications, is vital to generating new product ideas, converting them into viable products accepted by consumers, and seeing the product through to market. While different internal stakeholders will play various roles based on the company's innovation approach, product innovation often involves the following key stakeholders:

- **Strategy** leads the development of the overall vision and long-term plan for innovative products' role in the overall business strategy.
- **Sustainability** works internally or with outside partners to assess the GHG emissions impact of the company's product portfolio to understand the potential for methane reduction. In addition to ensuring that new formulations have a lower methane impact, the sustainability team should also ensure that new formulations do not have other social and environmental trade-offs.
- **R&D** drives concept development, prototyping, and testing of new product formulas for shelf life, taste, quality, and other factors.

- **Finance** develops the budget and cost analysis for product innovation and portfolio diversification.
- **Procurement** coordinates with existing or new suppliers to source and manage the raw materials needed for new or reformulated products. With the sustainability team, procurement should ensure new ingredients are screened for supply chain risks to avoid negative social or environmental impacts or other unintended consequences.
- **Marketing and communications** develop the communications and branding strategy for the launch of new, more sustainable, products so that they are attractive to consumers in the marketplace.

While the stakeholders listed above are critical to implementing product innovation in dairy-sourcing companies, other internal teams, such as regulatory affairs, engineering, packaging, quality assurance, and sales, also play a role in product innovation. Companies' business or product innovation strategies may vary depending on overarching business goals, implementation feasibility, consumer trends, and market dynamics. Companies must engage with internal stakeholders to determine the best approach for an internal innovation strategy, which could involve many different actions.

Extending dairy product shelf life

Often used in the apparel and consumer goods sectors, product lifespan extension is a common practice to minimize product environmental impact and improve sustainability. For a dairy company, this means extending the shelf life of dairy products. Developing shelf-stable dairy products or using ultra-pasteurization and other techniques can increase shelf life. The U.S. Department of Agriculture (USDA) estimates that dairy products comprise 17% of all food waste in the U.S.[6] By extending shelf life, companies can reduce dairy spoilage and waste throughout the value chain, thereby requiring less milk production to meet consumer needs and minimizing emissions from disposing of dairy products and packaging in landfills. However, for shelf-stable products and ultra-pasteurization to minimize food waste in practice, retailers must align their product shelf-life policies to accommodate these innovative products rather than treating them like those with shorter shelf lives and disposing of them before they actually expire. In addition to combatting waste, extending shelf life could also be used to address surplus milk production in fluctuating consumer demand. Further, industry-wide innovation and policy advocacy on labeling and sell-by-date laws could also help reduce dairy waste and, thus, methane throughout the value chain. As with engaging farmers and suppliers in testing methane mitigation technologies, sell-by-date laws are an area where two strategies—product innovation and policy advocacy—can be employed together to address dairy methane emissions.

Product reformulation and diversification

Some companies are responding to changing consumer preferences by reformulating products and diversifying their product portfolios. While DMAA focuses on reducing methane from a company's dairy value chain and existing dairy portfolio, integrating new products and ingredients may consequently require less milk and thus reduce a company's corporate GHG footprint. R&D, food science, and engineering teams are typically heavily involved in product reformulation. The development and success of new and reformulated products are predicated on consumer demand. Products must undergo rigorous R&D testing to ensure that they are palatable, marketable, and sustainable. Part of this R&D process includes holistically assessing different social and environmental tradeoffs when reformulating or diversifying products or ingredients. Factors such as labor practices, energy consumption, transportation distances, water consumption, and deforestation should all be weighed. For example, companies have been experimenting with blended products. Blended or hybrid dairy uses both dairy and plant-based ingredients to provide a product with a lower GHG footprint while retaining some of dairy's nutritional value, flavor, and consistency. In 2024, Kerry Group launched Smug Dairy, a product line that offers milk, cheese, and butter dairy products blended with oat milk and other plant-based ingredients.

Public policy advocacy

While voluntary action by companies has laid the groundwork for reducing corporate emissions, public policy is another critical mechanism to deliver methane reductions at the scale needed to minimize the worst impacts of climate change. Corporate engagement on climate policy is a crucial lever companies can employ to achieve these broader climate goals and advance their own methane reduction strategies. This proactive approach to methane reduction will contribute to the dairy industry's long-term viability by minimizing the future risks of climate change.

Advocating for policy changes goes beyond corporate membership in groups and organizations focused on climate policy and can involve direct public support for specific policies and engagement at the local, regional (e.g., state, province), and federal levels. By engaging in policy and advocacy efforts, companies can support initiatives that accelerate the innovation, regulatory approval, and implementation of methane-abating solutions. Climate policy is a critical lever in corporate sustainability leadership, which can be divided into three actions, as outlined in the AAA framework for climate policy leadership:

As companies advocate for policy, align with industry trade groups, and allocate advocacy spending to support methane abatement solutions, it is important to consider both the internal and external stakeholders to engage in each action. Alignment across the organization, including trade association relationships and philanthropic giving, can help create a robust public policy advocacy strategy.

Advocate for legislation and policy

Advocating for legislation and policy that advances methane abatement can be as simple as publicly supporting key pieces of legislation or as involved as engaging with local, regional, and federal politicians and participating in the public comment period for proposed legislation.

A company must first decide which policies and legislation are most critical to driving its methane agenda forward. Dairy industry trade associations and climate-oriented NGOs can help keep companies informed. Policies that support and advance methane reductions can generally be categorized into one of the following focus areas:

1. **Farmer support:** Legislation that provides financial and technical support to farmers implementing methane solutions and lays the groundwork to advance methane MMRV. Examples include the U.S. Farm Bill and the EU CAP.

2. **Removes roadblocks:** Legislation that streamlines the approval process for methane solutions, such as feed additives and other novel technologies like vaccines and improved genetics. One example of a roadblock-removing policy is the Innovative Feed Enhancement and Economic Development Act (Innovative FEED Act), which is intended to expedite the approval process for methane-reducing feed products. Though not yet passed as of spring 2025, the legislation has bipartisan sponsors in the U.S. House of Representatives and Senate.

3. **Unlocks new solutions:** Legislation that increases public R&D funding to support early-stage methane innovation and provides production-linked incentives for start-ups to scale solutions. Several policies are working towards this, including New Zealand's Agricultural Greenhouse Gas Research Centre's Innovation Fund and the Enteric Methane Innovation Tools for Lower Emissions and Sustainable Stock Act (EMIT LESS Act) in the U.S.

4. **Innovative funding or financial solutions:** Legislation that incentivizes farmers to adopt methane abatement practices. This could involve developing novel frameworks for certifying carbon removals or policies to subsidize low-methane dairy production. The EU Carbon Removals and Carbon Farming regulation is one example of such a policy.

As companies advocate for legislation and policy changes, internal and external stakeholders must understand the "what" and the "why": what the company supports and advocates for and why this is important to the company's broader sustainability goals. Internal collaboration between the sustainability team, corporate affairs, c-suite, and marketing and communications can help companies deliver a cohesive message and strategy to advocate for climate policy. The EDF Net Zero Action Accelerator Assess Your Trade Associations guide outlines how companies can evaluate whether their trade associations support their climate objectives and initiate dialogues to address any misalignment.

Align with trade groups

Aligning with dairy industry trade groups that support methane reduction goals is another lever companies can employ to engage with stakeholders on public policy and advocacy. Trade groups within the dairy industry can help influence public policy in their jurisdiction. Their collective voice represents and advocates for their members' needs through lobbying, drafting support for legislative agendas, and collectively calling members to political action.

The trade groups representing companies should advocate for broader business needs and policies that support a robust dairy sustainability agenda and methane reduction goals. In the report, Responsible Policy Engagement, Ceres found that the lobbying actions of industry trade associations often conflict with what companies publicly communicate as their stance on climate change. This research found that 94% of Standard and Poor's (S&P) 100 companies publicly affirmed the science of climate change and 50% lobbied directly to support climate policy. However, only 8% of companies have publicly assessed their trade organizations' stance on climate policies for any misalignment. This indicates an opportunity for companies to ensure that their trade groups are equally aligned with their company positions on climate policy.

In addition to lobbying for or against climate policies, trade organizations can indirectly impact climate by lobbying for more flexible milk pricing. In the U.S., milk pricing is set through Federal Milk Marketing Orders (FMMOs) overseen by the USDA. When milk prices are low and margins are thin, farmers have a limited ability to invest in innovation and implement methane reduction projects. For this reason, International Dairy Foods Association (IDFA) is working to change how milk pricing is set by urging USDA to make FMMOs more flexible and dynamic to encourage more significant investment and spur innovation.

Companies' relationships with trade groups represent a key opportunity for advancing climate action. Companies should assess the alignment of their trade groups' lobbying activities with their corporate climate and methane goals and advocate for a greater focus on climate policy where necessary.If a company is not currently a member of a dairy trade association, it may consider joining one that aligns with methane reduction plans. Their collective influence can often have a more significant impact than any single company's advocacy actions.

Allocate advocacy spending

Political spending can be critical to a company's overall climate agenda. A company can aim to allocate advocacy spending to organizations working to strengthen climate policies and advance methane reduction policies. Companies can send a strong message about their climate agenda through political giving. By publicly disclosing donations to political groups and organizations, companies can give verbal and financial support to organizations working to advance their climate and methane agendas. This action can be as simple as continuing to contribute to organizations that advance the company's climate agenda and stop giving to those that are hindering it.

BOX 12

Case study: National Milk Producers Federation support for the Innovative FEED Act

The National Milk Producers Federation (NMPF) has demonstrated strong public support for the Innovative FEED Act. This act would remove bureaucratic barriers in the federal review process of feed additives, allowing them to be reviewed through a more expedited process. NMPF recognizes the benefits this can bring to both companies and producers looking to reduce methane emissions and speed up the process of making feed additives more accessible to farmers in the U.S. NMPF put out a call to action, asking that its dairy allies write to members of congress to become sponsors for the Innovative FEED Act. Their call to action contains pre-drafted messages that companies can use to urge their congress members to endorse this piece of legislation. This is one example of a trade organization actively supporting methane abatement policies. Companies looking to use feed additives as a methane reduction strategy can align themselves with the NMPF and actively advocate for policies that remove approval roadblocks.

CROSS-SECTOR AND VALUE CHAIN COLLABORATION

CROSS-SECTOR AND VALUE CHAIN COLLABORATION

To advance methane mitigation efforts in the dairy sector, companies and other industry stakeholders can and must partner to address systemic barriers through farmer and supplier engagement, innovation, and public policy and advocacy. While DMAA is working to organize leading food and agriculture companies to pave the way for dairy methane reductions, many other organizations and initiatives are catalyzing this work and driving collaboration across the dairy industry.

Below is a non-exhaustive list of organizations, initiatives, resources, and tools aiming to accelerate dairy climate and methane action. This list is meant to showcase different opportunities for dairy-sourcing companies to work collaboratively with value chain partners and peers on methane reduction initiatives rather than in silos.

KEY

- FARMER AND SUPPLIER ENGAGEMENT
- INNOVATION
- PUBLIC POLICY AND ADVOCACY

TABLE 2

Existing dairy methane organizations, initiatives, resources, and tools

Initiatives	
	AgriZero NZ is a partnership between the New Zealand government and agribusinesses that helps farmers access affordable and effective tools to reduce methane and nitrous oxide emissions while maintaining productivity and profitability.
	The Clarity and Leadership for Environmental Awareness and Research (CLEAR Center) at the University of California, Davis (UC Davis) leverages university research and agricultural extension to drive efficiency and reduce environmental and climate impact across the animal agriculture sector. Key research topics include quantifying and mitigating GHG emissions from livestock.
	Launched in 2021 by the Innovation Center for U.S. Dairy, Syngenta and The Nature Conservancy, the Dairy Feed in Focus program is an industry-led effort to help improve feed production and feed efficiency on U.S. dairy farms, while reducing GHG emissions and contributing to improved water quality and soil health.
	The Dairy Methane Action Alliance (DMAA) is a global initiative to accelerate action and transparency on methane across the dairy sector. By joining this groundbreaking initiative, signatory companies commit to account for and publicly disclose methane emissions within their dairy supply chains and to publish and implement a comprehensive methane action plan. Environmental Defense Fund and the sustainability nonprofit Ceres will help to ensure companies are making progress against key milestones.
	The Dairy Sustainability Framework (DSF) is a global collaborative project developed to connect members of the dairy value chain facing similar sustainability challenges around the dairy world. The DSF is focused on 11 key sustainability criteria across the areas of economic, environmental, and social sustainability.
	A four-year programme between DairyNZ and Ireland's Agriculture and Food Development Authority (Teagasc), University College Cork and Irish Cattle Breeding Federation will see researchers, students, professors and database technology experts work together to quantify methane emissions from dairy cows in pasture-based systems.
	DataGene is an initiative of Dairy Australia that's driving genetic gain and herd improvement in the country's dairy industry. DataGene publishes three indices that track desirable genetic traits among Australia's 1.4 million cattle: A Balanced Performance Index, for traits that affect their lifetime contribution to the farm business; a Health Weighted Index, which fast tracks genetic gain for fertility, feed efficiency, and disease resistance; and a Sustainability Index, which fast tracks genetic gain for reduced methane emissions intensity.
	Global Methane Hub Enteric Fermentation Research & Development Accelerator is the largest-ever globally coordinated investment in technologies to address and reduce methane emissions from livestock. The Accelerator was announced at the COP28 Business & Philanthropy Climate Forum and is a funding initiative between public, private, and philanthropic partners across the globe.
	The Global Methane Initiative (GMI) is an international public-private partnership focused on reducing barriers to the recovery and use of methane as a valuable energy source. GMI provides technical support to deploy methane-to-energy projects around the world that enable Partner Countries to launch methane recovery and use projects. GMI focuses on three key sectors: oil and gas, biogas, and coal mines.

	Greener Cattle Initiative showcases the consortium of stakeholders who share knowledge, leverage investments, and accelerate research to identify, develop, and/or validate scientifically sound, commercially feasible, and socially responsible practices and technologies that reduce enteric methane emissions from dairy and beef cattle to slow the effects of climate change.
	Methane 2030 is a French initiative led by APIS-GENE, a ruminant genomics company, that aims to identify and develop solutions to reduce enteric methane emissions from cattle through collective action.
	Pathways to Dairy Net Zero amplifies the work of existing efforts and initiatives to reduce global dairy GHG emissions over the next 30 years. The initiative engages dairy farms of all sizes and types as well as different organizations across the dairy supply chain.
	The Resilient Dairy Genome Project is an international large-scale applied research project that aims to generate genomic tools to breed more resilient dairy cows, with a focus on improving feed efficiency and reducing dairy GHGs.
	The U.S. Dairy Net Zero Initiative (NZI) is a collaboration of dairy organizations to advance research, on-farm pilots and new market development to make sustainability practices more accessible and affordable to farms of all sizes. NZI aims to make progress toward sustainability goals while improving U.S. dairy farmer livelihood.
Resources	
	Cultivating Climate-Smart Dairy is an EDF guide to help food companies engage farmers on dairy methane solutions. The guide walks readers through how to get started with new manure management systems, what manure management systems exist today, and how those systems fit different operations.
	Dairy Conservation Navigator is an online platform that consolidates and simplifies complex topics about dairy conservation by providing access to credible, science-based resources and building awareness of on-farm conservation and sustainability practices. It also provides resources on funding and financing opportunities that support dairy sustainability.
	Decode 6 Explainers provides short overviews of climate and environmental information. Through the Decode 6 Platform, DMI is currently supporting the American Society of Agronomy in developing carbon and ecosystem services and educational content specifically designed for in-field advisers, conservationists, agricultural retailers and other advisors serving dairy farmers.
	Financing Dairy Climate Solutions is an EDF guide that outlines eight innovative financing models that can help the dairy value chain and financial sector collaborate to reduce GHG emissions and generate other sustainability benefits from U.S. dairy.
	The International Dairy Federation global Carbon Footprint standard for the dairy sector outlines how different value chain actors can measure and manage the carbon footprints of their dairy production systems and products using a life cycle assessment (LCA) approach. This standard is a foundation for the DMAA Dairy Methane Accounting guide, which helps companies disaggregate methane emissions from their existing corporate GHG inventories.
	Newtrient Solutions Catalog provides all dairy farmers with information regarding additives, practices, services, and technologies that meet the farm's manure and nutrient management goals and their business goals at the same time. Each solution highlighted is scored based on specific criteria to help farmers assess what is right for them.
	Strategic Roadmaps for SBTi Forest, Land, & Agriculture Targets is an EDF guide that aims to equip food companies with actionable guidance to more strategically advance ambitious climate targets aligned with the Science Based Targets initiative's (SBTi) guidance. The guide defines potential decarbonization pathways for six agricultural commodities, including dairy.
Tools	
	Cool Farm Tool, developed by the Cool Farm Alliance, offers quantified, credible, and standardized metrics to measure on-farm GHG emissions, biodiversity, water use, and food loss and waste for a variety of crop and livestock systems. Personalized results allow users to analyze different scenarios and gap analyses, develop tailored reduction strategies, understand the benefits of regenerative practices, and report against reduction targets.
	Evaluation Tool for Enteric Methane Mitigation assists dairy farmers, their trusted advisors, and other dairy value chain stakeholders in asking the right questions to evaluate the use of feed additives for enteric methane mitigation.
	FARM Environmental Stewardship (FARM ES) is an online tool specifically designed for dairy farms, with a secure, confidential platform to help farmers understand their environmental footprint and set a path for continuous improvement that makes business sense. The tool is based on the whole-farm, process-based model, RuFaS, which focuses on GHG emissions, energy use and nutrient management plans across dairy farms.
	Feed Additive Evaluation Guidance for Enteric Methane Mitigation summarizes dialogues with U.S. dairy industry experts across the value chain to examine the desired attributes important to transform feed additives from proof-of-concept into marketable best practices for enteric methane emission reduction and highlights barriers to broad adoption, existing best practices and opportunities to develop new best practices.
	Sustainable Agriculture Initiative (SAI) Platform is a pre-competitive forum for companies to develop sustainable agriculture solutions across their global value chains via working groups, specific projects, trainings, and other programming. The SAI Farm Sustainability Assessment enables food and beverage businesses to assess, improve, and validate on-farm sustainability for any crop in their supply chain, regardless of geography and farm size.

CONCLUSION

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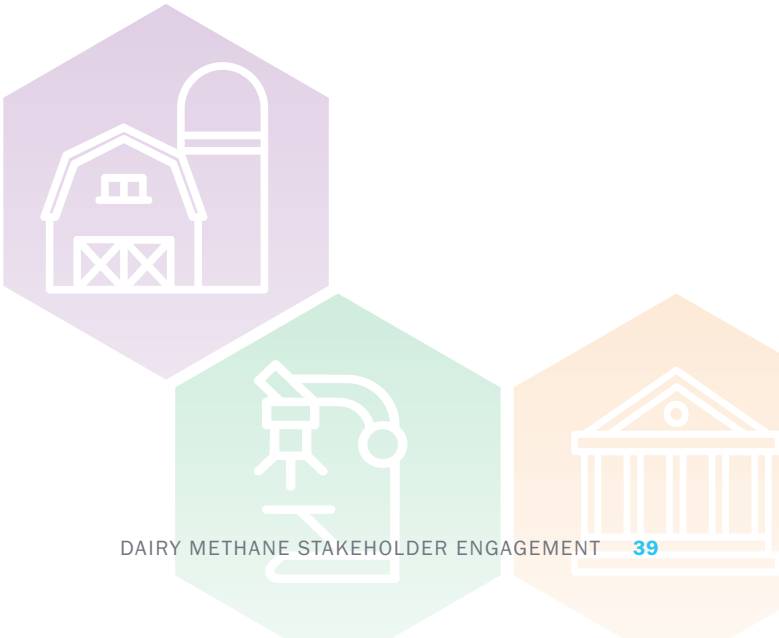
Engaging external and internal stakeholders across the dairy value chain is critical to implementing DMAPs and moving the needle on methane. Public stakeholder engagement also sends the market signal that methane reduction should be a global priority to ensure the resilience and long-term profitability of the dairy industry.

Working directly with farmers, co-ops, and other upstream dairy processors is the key to driving dairy methane reductions at the source. Supplier engagement can also help foster lasting business relationships and mitigate supply chain risks. Supporting farmers through thoughtful capacity building and technical support, financial investments and incentives, and data gathering and networking can help break down barriers and enable successful collaboration.

Dairy-sourcing companies can innovate externally by supporting methane abatement research groups, private companies developing novel technologies, and key suppliers for piloting solutions to develop next-generation methane-abating technologies. Companies can also innovate internally by developing low-methane products and adopting novel business policies, practices, and partnerships that prioritize methane reduction. Internal teams such as strategy, sustainability, R&D, finance, procurement, marketing and communications, and others must be involved to deploy this work across the organization.

Companies can support public policies that provide financial and technical support to farmers implementing methane solutions, streamline the approval process and remove roadblocks for methane solutions, and unlock novel solutions through increasing public R&D funding for methane solutions. Advocating for legislation and policy, aligning with industry trade groups, and allocating advocacy spending are the three main levers that can help companies support methane mitigation at the policy level.

While companies must tackle methane within their own operations and supply chains, collaboration is critical to scaling methane abatement solutions. Joining existing initiatives and working with peers, value chain partners, and other stakeholders to develop new programs and projects can help drive the immediate methane action required to minimize the worst impacts of climate change. Further, this type of collaboration can spur the long-term momentum needed to bend the curve on warming and future-proof the global dairy sector.



APPENDICES

APPENDICES

Appendix 1: Stakeholder engagement considerations by strategy

The following is a list of key considerations and questions companies can reflect on when determining how to engage stakeholders across farmer and supplier engagement, innovation, and policy and public advocacy strategies.

Farmer and supplier engagement

- Have you determined your methane hotspots by business unit, geography, product type, and/or supplier to tackle most material sources of methane?
- Have you chosen farmers and suppliers to engage in this work? How have they been chosen?
- What solutions, interventions, or engagements are available for farmers and suppliers to select? How were these options selected? Were farmers included in this process?
- How are you working to address and mitigate the risks farmers may encounter when changing management practices or implementing new technologies?
- How are you working to build trust with your suppliers?
- Farmers often get information from trusted advisors in their network. Which trusted advisors have you chosen to engage in this work to support farmers?
- Have you engaged trusted advisor networks to develop "train the trainer" programs for methane-mitigating initiatives? How do you plan to do so?
- Have you tailored your approach to technical assistance and training based on the farm type, geography, and scale? Just because a solution works in one region does not mean it will work in another.
- Have you allowed time for farmers to adapt to new management practices before full implementation? Incorporating new farming techniques requires local tailoring and often takes time to perfect.
- How are you promoting knowledge sharing and lessons learned among your farmer and supplier community to increase project uptake?
- What type of training programs and courses are you providing to your farmers and suppliers? Are they free of cost and/or open source?

- Who have you selected to administer these courses? Are they trusted advisors?
- How are you helping farmers and suppliers identify funding sources outside of your company?
- Have you set up formal channels to receive feedback from farmers on programs, projects, trainings, and pilots?
- How are you utilizing farmer networks to solicit feedback from the local farming community on pilots and other projects?
- How are you financially supporting farmer and supplier implementation of methane-reducing practices?

Innovation

(adapted from Transformation to Net Zero Innovating Net Zero Products and Services Transformation Guide)

- Have you gained internal alignment on an innovation strategy?

Externally focused innovation:

- Have you identified priority methane reduction solutions for your company?
- Have you identified which methane abatement research groups or private companies to partner with and support?
  - Have you disclosed these organizations?
- Have you engaged with partners and suppliers to design pilot projects (see farmers and stakeholder considerations)?

Internally focused innovation:

- Have you calculated the methane emissions profile of your current dairy products, identifying priority areas for innovation?
- Have you developed an internal, cross-functional team to prioritize, design, and deliver on product innovation?
- Have you conducted market research to ensure consumer acceptance and messaging of new products?
- Have you engaged with the marketing and communications team to develop a strategy for launching new products?

Public policy advocacy

(adapted from Transformation to Net Zero Innovating Net Zero Products and Services Transformation Guide)

- Have you determined policy positions on key climate topics that will enable the company and wider value chain to transform to net zero emissions?
- Have you gained internal alignment on policy positions from the c-suite and engaged internally on how public policy will help meet corporate sustainability goals?
- Have you identified an internal champion, armed with a clear business case for engaging in public policy advocacy, to help overcome internal review processes?
- Have you publicly disclosed all trade associations in which the company has a membership to meet investors' and stakeholders' interests in transparency?
- Have you audited trade associations' climate lobbying activities to ensure that the association's advocacy on climate policy continues to align with the organizational net zero vision?
- Have you joined or created climate-aligned taskforces committed to climate policy advocacy that are better aligned with corporate goals?
- Have you publicly disclosed spending on activities designed to influence climate policy, including all lobbying and political spending, direct and indirect?
- Have you disclosed policies and procedures for using corporate funds for lobbying or election-related activities?

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