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FINANCING DAIRY CLIMATE SOLUTIONS:

How the dairy value chain and financial sector can collaborate to reduce GHG emissions and generate other sustainability benefits from U.S. dairy

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One of the world's leading international nonprofit organizations, Environmental Defense Fund (EDF) creates transformational solutions to the most serious environmental problems. To do so, EDF links science, economics, law and innovative private sector partnerships. With more than 2.5 million members and offices in the United States, China, Mexico, Indonesia and the European Union, EDF's scientists, economists, attorneys and policy experts are working in 28 countries to turn our solutions into action.



Jacqi Coleman

Innovation Center for U.S. Dairy® was established in 2008 by farmers through the dairy checkoff to foster collaboration that progresses the industry's goal of building a healthy and sustainable future for the dairy community, the people it serves, and the planet we all share. The Innovation Center convenes diverse stakeholders and leaders to advance the U.S. dairy community's positive impact on shared social responsibility and sustainability priorities that include nutrition and health, food security, the environment, animal care, workforce and food safety. Through these efforts, the U.S. dairy community contributes to a more sustainable world for future generations. For more information, visit usdairy.com/about-us/innovation-center.



Laura Sands, Lisa Becker, Natalie Tinsen

Pinion is a leading food and agriculture advisory and accounting firm with roots dating back to 1932. The firm has expanded upon traditional tax and accounting services to deliver increased value and growth for clients through its specialized advisory in the areas of sustainability, government affairs, farm programs, land and water management, financial management, succession planning, and business strategy. Pinion serves domestic and international clientele from locations spanning the United States, Australia, and globally through its Pinion Global Network member firms.

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ABOUT THIS REPORT

This report was developed by Pinion, the Innovation Center for U.S. Dairy and Environmental Defense Fund, also known as EDF. It draws from a series of roundtable discussions convened in 2023 and 2024 by the Innovation Center and EDF that brought together dairy farmers, dairy cooperatives, processors, dairy buyers and financial institutions. The roundtables focused on the financial barriers to dairy sustainability and honed eight financial models that can foster collaboration and increase adoption of sustainable practices and technologies on U.S. dairy farms.



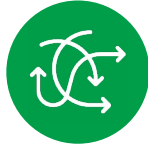
EXECUTIVE SUMMARY

The Environmental Defense Fund and the Innovation Center for U.S. Dairy partnered to create this report which outlines financial models designed to enable financial institutions to collaborate with the dairy sector in making economically viable climate mitigation investments on dairy farms.

The practice and technology changes that are the focus of this report were identified by scientists and the dairy sector as critical to achieve the U.S. dairy industry goal of greenhouse gas neutrality by 2050. They include alternative manure management strategies that reduce manure methane and feed additives that reduce enteric methane emissions. The report also identifies common financial barriers that dairy farmers encounter when securing the necessary funds for implementing sustainable practices.

Developing Farmer-Centric Financing Solutions

As the dairy value chain and financial sector collaborate to jointly explore innovative financial models, it is critical to consider the current financing landscape for dairy farmers and the changes necessary to activate widespread adoption of GHG reducing practices and technologies.



The current approach to financing dairy climate solutions is unscalable and cumbersome.



Financial models must be designed to overcome financial barriers to adoption that farmers face.



Collaboration is essential to finance dairy climate solutions at scale.

Collaboration is Essential to Design and Deploy Financing Solutions

Through ongoing collaboration between the dairy value chain and key financial institutions, eight financial models are identified as ready to be deployed in the U.S. dairy sector to support wider adoption of practices such as methane-reducing manure management practices and feed additives. Each financial model is assessed based on the financial barriers it addresses, its ability to scale and its applicability to farms of varying sizes. Each will require new kinds of collaboration from its participants but will generate benefits to all involved.

Financial Models:

1 Sustainability Linked Loan

2 Sustainability Linked Loan with Blended Finance

3 Green Loan

4 Impact Fund

5 Program-Scale Bridge Funding

6 Equity Investment

7 Loan Guarantee

8 Financial Solutions for Enteric Emission Reductions

The roundtable discussions and this resulting report show that the dairy value chain and financial institutions are ready to engage with each other, finding new ways to support dairy farmers in adopting farming practices and technologies that reduce greenhouse gas emissions. It is the authors' hope that this report serves as a launching point for additional collaboration and new financial opportunities for farmers who reduce methane emissions.

INTRODUCTION

In 2008, the Innovation Center for U.S. Dairy was founded by dairy farmers as a pre-competitive leadership forum for the U.S. dairy community to advance solutions for a more sustainable world and thriving U.S. dairy community. Since that time, the Innovation Center has engaged the U.S. dairy supply chain to work collaboratively on collective priorities to advance well-being, regenerate the environment and care for our animals and communities.

The U.S. dairy sector accounts for 11% of U.S. methane emissions.¹ Methane (CH₄) is a short-lived climate pollutant, having more than 80 times the warming power of carbon dioxide (CO₂) in the first 20 years. Even though CO₂ has a longer-lasting effect, methane sets the pace for warming in the near term. Reducing global methane emissions by at least 30% from 2020 levels by 2030 is one of the fastest ways to slow global warming by mid-century.² To reduce these emissions, the U.S. dairy sector is collaborating through existing industry organizations aimed at achieving sustainability-related objectives.

In 2020, the Innovation Center set industry environmental stewardship goals for 2050.³ These collective goals are to:

- Achieve greenhouse gas neutrality,
- Optimize water use while maximizing recycling and
- Improve water quality by optimizing utilization of manure and nutrients.

Dairy farms, cooperatives and processors across the industry are taking actions and leading innovations to contribute toward these goals. To build a pathway toward the 2050 goals, six national dairy organizations came together to make sustainable dairy production more accessible and economically viable for farms of varying scales and geographies.⁴ Not every company or farm will achieve each goal individually. U.S. dairy's success will come from the collective efforts of all, combined with other initiatives throughout the supply chain.

Today, many dairy farmers already employ technologies and practices that reduce emissions and improve resource use and productivity to drive meaningful progress. Emissions reductions can be made within any of the four main categories of emissions that make up a U.S. dairy farm's greenhouse gas footprint: enteric emissions, emissions from manure management, emissions from feed production and energy-based emissions.⁵

Due to innovative farming and feed production practices, the environmental impact of producing a gallon of milk in 2017 required 30% less water, 21% less land and a 19% smaller GHG footprint than it did in 2007.

Source: Judith L Capper, Roger A Cady, "The effects of improved performance in the U.S. dairy cattle industry on environmental impacts between 2007 and 2017" (2020). <https://doi.org/10.1093/jas/skz291>

1 EDF. "Methane Emissions in Animal Agriculture" (n.d.).

2 United Nations Environment Programme/Climate and Clean Air Coalition. "Global Methane Assessment: 2030 Baseline Report." (2022).

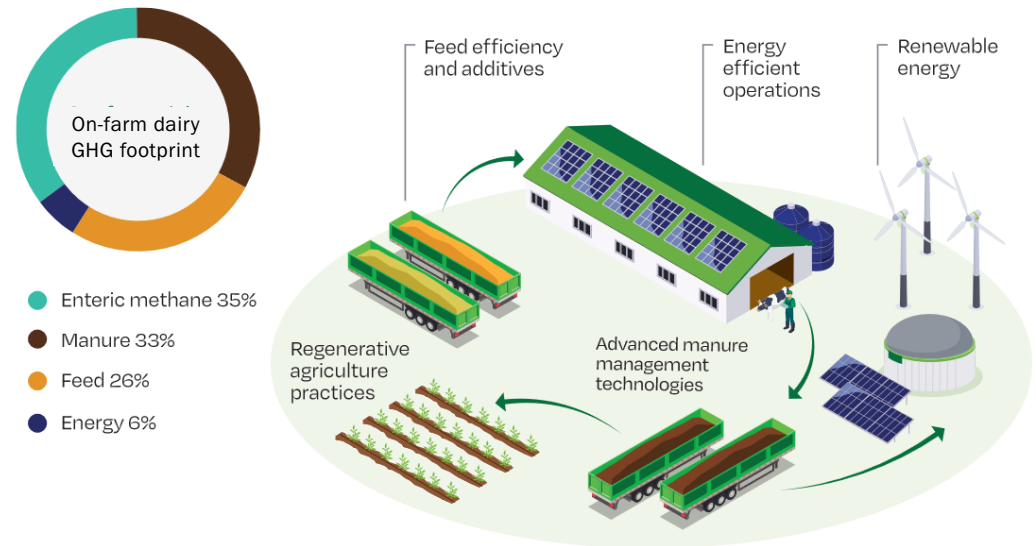
3 U.S. Dairy. "Dairy and the environment" (n.d.).

4 U.S. Dairy. "U.S. Dairy Net Zero Initiative" (n.d.).

5 U.S. Dairy. "2021-2022 U.S. Dairy Sustainability Report" (2024).

FIGURE 1

Key focus areas to reduce GHG footprint on farms



Source: U.S. Dairy Industry⁶

To reduce methane emissions, we are focused on two areas that need areas of the farm for additional attention and investment to scale. The first is manure management systems such as simpler, lower-cost digester systems (e.g., cap and flare) and non-digester manure management strategies to reduce or avoid methane emissions – including solid-liquid separation, composting and more. The second is feed additives that reduce enteric methane emissions.

The current approach to financing dairy climate solutions is unscalable and cumbersome.

For farmers who are currently interested in implementing a new practice or technology, the typical starting point is to engage a technical expert to assess the appropriateness of the practice or technology given the dairy's existing structure and operations.

Once viable mitigation practices and technology are selected, farmers, as business owners, consider the related capital expenses, operating expenses and return on investment. If a return on investment is not likely or is far off, farmers then are faced with identifying funding assistance, which, when available, can be obtained through government cost-share or grants, value chain incentives or philanthropic funds. Though there are funding programs that exist to support dairy farmers in adopting new practices, it can be challenging to determine eligibility and submit applications for these programs without additional guidance and assistance.

If the full cost of new practice adoption is not covered by existing funding pools or additional revenue, dairy farmers then need to consider how to pay for the remaining cost of implementation. Depending on the farm's cash flow, this may be paid out of pocket or would require the farmer to reach out to their lender to obtain financing.

⁶ U.S. Dairy. "2021-2022 U.S. Dairy Sustainability Report" (2024).

The evolution of incentives and finance for anaerobic digesters

With the advent of the inclusion of renewable natural gas (RNG) from dairy and other livestock digesters in California's Low Carbon Fuel Standard (LCFS) market, there has been substantial interest from the livestock and energy sectors in developing anaerobic digesters given the low carbon intensity score of bio-compressed natural gas and bio-liquefied natural gas produced from RNG.

LCFS credits can be generated and sold to meet compliance requirements within the transportation sector. This incentive led to the rapid implementation of anaerobic digesters on dairy farms. Dairy biogas has increased to represent half of all natural gas used for transportation in California today.

This is a valuable example of how the right combination of markets, policy and finance can lead to the rapid uptake of a sustainability practice. Due to the extensive focus on large digesters in other publications and resources, they are not included in this report, which focuses on manure management practices that may work on farms that are not a good fit for large digesters.

Source: <https://energyathaas.wordpress.com/2024/01/22/cow-poop-is-now-a-big-part-of-california-fuel-policy/>

The current approach is complex and inefficient for farmers to navigate, with the vast majority of the work to secure funding falling on the farmer. In addition, farmers have to figure out how different funding and financing pieces fit together. Dairy cooperatives and nonprofit farmer or conservation organizations are increasingly taking on the role of applying for funds and coordinating projects, but they too often face similar barriers in supplying the administrative capacity for this work and navigating a complex funding landscape. This leads to bespoke financing solutions for individual farms rather than replicable models that can scale.

While the current approach to financing dairy climate solutions has worked for some farmers, if the dairy sector is to support the adoption of climate solutions at a greater scale, the financing available must become more effective in meeting farmers' needs and reducing the burdens of applying for funding and navigating the compatibility of different sources of funds. New financial models are needed to overcome these barriers and effectively finance farmers' adoption of these technologies and practices.

Financial models must be designed to overcome the financial barriers to adoption that farmers face.

Dairy farmers are continuously looking for ways to improve the environmental impacts of their operations. Sustainable dairy farms seek to implement practices that make sense for the animals, the environment and their business. However, farmers face barriers to adopting new practices and technologies that can improve environmental outcomes. These barriers can include a lack of technical support and other operational difficulties. This report focuses on the financial barriers to new practices and technologies.

Financial Considerations

When first considering the voluntary adoption of new practices and technology, dairy farmers must take into account their current operational structure. Existing facilities significantly influence the choice, efficiency and cost of new manure management system upgrades. Older facilities may face higher renovation costs to integrate modern manure management technologies. The interconnectedness of manure management systems means that the introduction of a new practice or technology may require additional system changes, which can add cost and complexity that pose significant challenges to adopting more efficient and sustainable manure management practices.

The size of the farm amplifies the financial and infrastructural challenges associated with adopting sustainable practices. Larger farms often have the necessary infrastructure in place, allowing for more efficient and cost-effective adoption of advanced manure management systems. However, adjusted gross income (AGI) limitations set by Congress and USDA prevent some larger dairies from accessing cost-share programs. Smaller farms, in contrast, may struggle with the high costs and logistical demands of upgrading or installing new systems, hindering their ability to implement manure management upgrades effectively.⁷

Financial Barriers to Technology and Practice Implementation

Several financial barriers significantly impact the feasibility of dairy farmers' adoption of new manure management practices and feed additives. Financial barriers include:

- 1. Implementing new manure management practices often requires high upfront capital investments.** These costs may prevent farmers from installing new technologies, even when they have long-term economic and environmental benefits.⁸ Large capital investments often require financing, which adds interest expense payments to farms.
- 2. New manure management practices often necessitate ongoing operating expenses and additional labor requirements.** Feed additives also represent an ongoing, added cost to dairy production.
- 3. Farmers implementing new practices are often faced with gaps between expense payments and the receipt of funding to implement those changes,** especially in the case of government funding programs.
- 4. Some new practices and technologies bear additional risks associated with their implementation.** Farmers may be deterred from taking on that risk unless it is shared or transferred to another party.

As farmers consider the adoption of new practices and technologies, financial barriers must be addressed to make these opportunities viable. **Table 1**, on the following page, outlines some practices for reducing dairy methane emissions as well as associated costs, financial barriers and financial benefits associated with their adoption.

The costs associated with each practice are typically either capital expenditures (CapEx) or operating expenses (OpEx). Capital expenditures are the initial upfront investment that a dairy farmer would need to make when installing a large new piece of equipment or system, and these costs are typically only incurred one time (e.g., the purchase and installation of fixed assets). Operating expenses are ongoing costs associated with year-over-year use of the technologies listed below (e.g. maintenance, energy use and labor). Distinguishing between CapEx and OpEx is important to consider because it affects the timing of capital outlays for farmers and therefore the resulting financial barriers.

The benefits listed in Table 1 are those inherent to the implementation of the practice — whether that is cost savings or the generation of value-added products that can be sold. In addition to these financial benefits, cost-share funding or outcomes payments may be available from a variety of public and private sources. For example, as discussed in Model 8 it is unlikely that farmers will adopt enteric feed additives unless they are compensated for the cost of those additives.

⁷ Powell J.M., McCrory, D.F., Jackson-Smith, D.B. and Saam, H. "Manure collection and distribution on Wisconsin dairy farms" (2005). *J. Environ. Qual.* 34 2036-44

⁸ Niles, M. T., Horner, C., Chintala, R., & Tricarico, J. "A review of determinants for dairy farmer decision making on manure management strategies in high-income countries." (2019). *Environmental Research Letters*, 14(5), 1- 15

TABLE 1

Examples of dairy methane-reducing practices and technologies and associated financial barriers and benefits

Practice / Technology	Description	Associated Costs/Barriers	Financial Benefits
Cap and Flare	Capping the manure storage tank with a flexible cover and flaring (burning) the biogas that is produced.	Cap and flare system OpEx: Maintenance costs	Reduced manure handling costs due to reduced water in manure storage systems.
Solid-liquid separation	Separating manure solids from manure liquids using either mechanical or chemical means.	CapEx: Separation system (mechanical separation only) OpEx: Chemical separator (chemical separation only), energy and maintenance costs	Manure solids can replace purchased bedding material, saving bedding costs or they can be used to replace commercial fertilizers and reduce fertilizer costs.
Composting	Piling manure, often into windrows, and promoting aerobic decomposition by turning the piles, which produces a nutrient-rich soil amendment.	CapEx: Composting equipment, spreading equipment OpEx: Labor, maintenance and energy costs, bulking material	Reduced fertilizer costs if used on-farm, revenue from sale of compost.
Evaporation ⁹	Removing water from manure through mechanical vapor recompression (MVR), which heats the manure generated and allows the water to evaporate, resulting in two forms of fertilizers and reusable water.	CapEx: MVR equipment OpEx: Energy and maintenance costs	Reduced fertilizer costs if used on-farm, revenue from sale of phosphorus and nitrogen products.
Converting Flush to Scrape	Replacing flush systems, which use water to flush manure out of barns, with scrape systems, which use mechanical scrapers to remove manure.	Automatic scraping system OpEx: Energy and maintenance costs	Reduced water pump electricity costs.
Vermifiltration	Treating wastewater contaminated with manure by passing it through a bed of earthworms. The earthworms consume organic matter and produce nutrient-rich castings that can be used as fertilizer.	CapEx: Vermifiltration system OpEx: Maintenance and labor costs	Reduced fertilizer costs if used on-farm, revenue from sale of vermicompost.
Feed additives	Reducing enteric methane emissions from dairy cows and other ruminants by inhibiting or modifying microorganisms in the cows' rumen.	OpEx: Feed additive, labor and management costs	None.

⁹ See: https://www.newtrient.com/newtrient-solutions-catalog/?_sft_technology_type=evaporative-technologies; <https://www.newtrient.com/technology-type/evaporative-technologies/>

Why finance?

While the term “finance” is sometimes used very broadly to describe both sources of funding that expect a financial return and those that are purely grants, this report focuses on financial models that include some form of financial repayment. This is for several reasons. Many stakeholders are committed to reducing GHG emissions in agriculture, but they can't pay for these improvements on their own. Federal and state governments, food and agriculture companies and foundations are committed to contributing funds to farmers for these investments. Farmers can also benefit from these practices and technologies, but often not enough to justify paying for the improvements entirely by themselves. Many new practices and technologies require large amounts of financial capital that farmers do not have in reserve.

U.S. dairy will only unlock the power of commercial capital from agricultural finance institutions if viable models are identified that include loans that can be repaid. Financing models with low rates or flexible terms can distribute costs among stakeholders and across time to match farmers' cash flow. This report is intended to identify those models with the goal of bolstering collaboration between the dairy value chain and the agricultural finance sector to generate more flexible and fit-for-purpose finance for dairy climate solutions.

The exception to the report's focus on financial models that incorporate repayment is financial solutions for enteric emission reductions (Model 8). The report authors decided to incorporate this model because recently the U.S. FDA allowed for the use of a feed additive that reduces enteric emissions, thus creating a need to understand how it is currently being financed.¹⁰ While this financial model is nascent in the U.S., it is important for the report audience to understand the current approach of the dairy value chain to funding this climate solution.

Finally, though this report focuses on identifying financial models to support the implementation of methane-reducing practices and technologies, the models included in this report can be utilized to finance a wider range of projects focused on achieving broader environmental benefits such as water conservation, water quality improvements, regenerating soil health and promoting biodiversity, among many others.

Challenges with existing cost share programs

Though government cost share programs provide critical funding for dairy farmers to implement new practices, challenges exist. Due to adjusted gross income (AGI) and payment limitations set by Congress and USDA, many dairies are unable to access cost share programs. Additionally, for most programs, farmers are only reimbursed for expenses once they are incurred, creating a cash flow strain for farmers who not only pay for their portion of the cost but also front the reimbursable portion.

Given these strains, finance mechanisms can rapidly accelerate voluntary action as they provide an alternative solution to the program restrictions and timing constraints that exist for cost share programs.

10 EDF. “FDA Paves the Way for Reducing Methane Emissions From Livestock” (2024).

Collaboration is essential to finance dairy climate solutions at scale.

The development and deployment of financial models that advance dairy climate solutions will require substantial collaboration across a variety of partners, including dairy companies, financial institutions and government programs. Impact investors and/or philanthropic support can also be valuable in the initial stages of deployment. Each of these partners has different roles and objectives in collaborating.

Dairy companies

Major dairy companies are setting sustainability goals and developing programs and incentives to support reductions in their Scope 3 emissions. Announced at COP28 in 2023, the Dairy Methane Action Alliance is a global initiative that accelerates action and accountability to reduce methane across the dairy sector. Signatory companies commit to annually account for and publicly disclose methane emissions within their dairy supply chains and to publish and implement a comprehensive methane action plan.¹¹

Many dairy cooperatives, processors and downstream dairy customers have set GHG emission reduction goals, adhering to standards for target setting and accounting set by independent bodies such as the Science Based Targets initiative and the Greenhouse Gas Protocol, enabling them to make claims for environmental improvements associated with their emission reduction programs and investments. To support dairy farmers in adopting climate-smart practices, the dairy value chain has begun to offer financial support alongside government grants. Most programs currently take the form of cost-share payments, pay-by-practice or outcomes payments rather than product premiums or participation in financing.

The dairy industry has pursued sustainability objectives pre-competitively for decades, and it continues to work collaboratively at the national and global scale to advance U.S. dairy's progress and accelerate industry-wide support. Dairy companies can collaborate across the value chain and with partners outside of the dairy industry, such as financial institutions and non-government organizations, to identify new tools that can be deployed to finance various practices including manure management and enteric methane emission reduction strategies highlighted here.



Dairy Methane Action Alliance signatories include Danone, General Mills, Kraft Heinz, Lactalis USA, Nestlé, The Bel Group, Clover Sonoma, and Starbucks.

The Alliance is convened by EDF and supported by Ceres.



¹¹ Mannino, G. "Dairy Methane Action Alliance" (2024).

Financial institutions

Farmers rely on banks and credit cooperatives, collectively referred to as agricultural finance institutions, to purchase land, equipment, animals and inputs such as feed. These agricultural lenders are often farmers' closest financial partners and are seen as trusted advisors. In the U.S., the vast majority of agricultural finance comes from either Farm Credit cooperatives or banks. The Farm Credit system and banks have roughly equal shares of farm debt, both with approximately 40% of U.S. farm debt. The Farm Credit system is comprised of 58 independent cooperatives that directly finance farmers, and four regional banks that finance the Farm Credit cooperatives and other agricultural cooperatives. The bank sector includes both larger banks that have significant agricultural portfolios (e.g., Wells Fargo) and many smaller regional and community banks.

In 2022, EDF and Deloitte completed the first global survey of agricultural finance institutions on climate risks and opportunities. Of the respondents, 76 were from the U.S. and represented both Farm Credits and banks. In the U.S., 71% of agricultural finance institutions have not set climate change goals for agriculture and do not have plans to do so.¹² Large, multinational agricultural finance institutions have more established sustainability goals and staff, and several plan to set net-zero targets for their agriculture portfolios. This does not mean that the majority that do not plan to set such targets are not interested in engaging on sustainability topics. They are more often motivated by the financial health of their customers and the desire to keep up with customer and market trends. Several major U.S. agricultural finance institutions are taking important steps to develop their own sustainability capacity and programs. Within the past two years, several of the largest Farm Credit associations have hired their first sustainability officers and released their first sustainability plans. However, agricultural finance programs or products that explicitly support farmers and other agricultural businesses achieve their sustainability goals are nascent across the board.

Recognizing the goals and momentum of the dairy industry on its sustainability goals, agricultural finance institutions are interested in finding a role they can play in facilitating financial solutions that work for dairies and their industry partners.

Government programs

Public funding for climate-smart agriculture has increased significantly over the past five years. The dairy value chain is utilizing a range of United States Department of Agriculture (USDA) funding sources to catalyze methane reductions and other sustainability actions on farms. In many cases, this federal funding can fund at least a portion of the investments that farmers and their lenders may not be able to undertake alone. To encourage the adoption of sustainable practices and address the significant financial barriers that farmers face, USDA has committed to investing \$3.1 billion through the Partnerships for Climate-Smart Commodities (PCSC) program, which supports farmers across various agriculture sectors, focusing on delivering greenhouse gas reductions and providing meaningful benefits to agricultural production.¹³ Currently, the PCSC is funding 135 climate-smart projects consisting of seven projects that focus on dairy and another 16 projects that include opportunities for dairy farmers.¹⁴

12 Gauthier, V., Monast, M., Environmental Defense Fund, Watkins, S., Moik, K., Chen, T., & Deloitte Consulting LLP. "The impacts of climate change on agricultural finance" (2022).

13 USDA. "Partnerships for Climate-Smart Commodities" (n.d.).

14 USDA. "Partnerships for Climate-Smart Commodities" (n.d.).

Additionally, the Inflation Reduction Act (IRA) provides significant financial support to farmers by expanding funding pools for various USDA Natural Resources Conservation Service (NRCS) programs. The expanded programs include several that dairies regularly participate in. The Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program (CSP) both offer cost-share funding for conservation practices on dairies,^{15, 16} and the Regional Conservation Partnership Program (RCPP) enables private companies to match public funding and deploy conservation incentives in targeted ways to specific supply chains or using innovative incentive strategies.¹⁷ This support, totaling about \$19.5 billion for USDA conservation programs that will be spent through 2032, is designed to enable producers to implement expanded conservation practices that reduce greenhouse gas emissions and provide expanded funding for technical assistance.¹⁸

In addition to these opportunities for climate-smart agriculture primarily made available through the USDA, a new program established by IRA and administered by the U.S. Environmental Protection Agency (EPA) may also help catalyze financing for climate-smart agriculture. The Greenhouse Gas Reduction Fund (GGRF) is a \$27 billion investment to combat the climate crisis by mobilizing financing and private capital for greenhouse gas- and air pollution-reducing projects in communities across the country.¹⁹ A coalition of agricultural finance institutions and agriculture and environmental organizations came together to identify opportunities to participate in this program. The new Agriculture Finance Sustainability Coalition successfully joined the proposal led by Climate United, which was awarded nearly \$7 billion in GGRF funding in April of 2024.^{20, 21} Climate-smart agriculture is one of several sectors targeted by Climate United, which will also invest in renewable energy, clean housing and clean transportation. However, the unique nature of the GGRF funding makes this opportunity particularly attractive to financial institutions – it is low-cost, flexible, risk-tolerant funding that is meant to revolve, enabling new blended finance structures that can effectively meet the financial needs of farmers making the transition to climate-smart practices and technologies. The Agriculture Finance Sustainability Coalition will continue to collaborate with Climate United to make these financial opportunities a reality in agriculture.

Finally, there are also funding programs at the state level for dairy sustainability projects. These sources of public funding are valuable for many farmers to improve the financial viability of new practices or technologies.

Impact investors and philanthropy

Bringing together dairy value chain, financial institution and government finance is a substantial task that requires navigating an array of different priorities and restrictions. In this context, flexible finance from impact investors or philanthropic sources can play a critical role in filling gaps and supporting the initial stages of project deployment. In particular, there is a need for greater use of catalytic capital, such as low-cost revolving funds to enable financial institutions to adjust the interest rates, repayment schedule and required risk of financial products offered to dairy farmers, dairy cooperatives and/or processors.

15 USDA. “[Conservation Stewardship Program](#)” (2022).

16 USDA. “[Environmental Quality Incentives Program](#)” (n.d.).

17 USDA. “[Regional Conservation Partnership Program](#)” (n.d.).

18 “[IRA Investments in USDA Loan and Conservation Programs](#)” (n.d.).

19 U.S. EPA. “[About the Greenhouse Gas Reduction Fund | US EPA](#)” (2024).

20 EDF. “[New Agriculture Finance Sustainability Coalition Partners With Multi-billion Dollar Awardee of the EPA’s National Clean Investment Fund](#)” (2024).

21 The Agriculture Finance Sustainability Coalition includes members Akiptan, Compeer Financial, Couser Cattle Company, Environmental Defense Fund, Farmers Business Network, Farm Credit Council, Farmer Mac, Growers Edge, Intertribal Agriculture Council, National Council of Farmer Cooperatives, National Milk Producers Federation, Native Agriculture Financial Services and Soil and Water Outcomes Fund.

Impact investors and philanthropies interested in playing a catalytic role in agriculture must have a basic understanding of the existing forms of finance available in the agriculture sector. Often, investors may have return expectations that are unrealistic given the thin margins of farming, and their capital may not offer more favorable returns or risk requirements than the status quo financial products commonly available to farmers. To truly be catalytic, impact investors and philanthropy must offer capital that can unlock the ability of private finance to tailor their financial products to the needs of their customers as they implement climate-smart practices and technologies.

When done well, these catalytic capital investments can be a triple win. First, they can generate direct environmental benefits through the deployment of new financial models. Second, they can create a springboard for new financial models to be proven and access to larger sources of funding such as public-private partnerships. And third, they can enable systemic change in the dairy value chain and financial sectors by fostering collaboration and demonstrating new ways to do business proactively supportive of climate-smart agriculture.

“Catalytic capital describes equity investments, loans, and other financial instruments that are designed to stimulate impact and attract third party investment that would likely not be possible otherwise.

By accepting disproportionate risk and/or concessionary returns, and by attracting more mainstream investors into high-impact deals, catalytic impact investors can play an important role in tackling the formidable social and environmental challenges the world faces and in building the field of impact investing.”

- *Catalytic Capital in Impact Investing: Forms, Features, and Functions*

“Blended finance enables organizations with different objectives to invest alongside each other while achieving individual objectives, whether that is generating a financial return, driving social impact, improving environmental outcomes, or all of the above.”

- *The Rockefeller Foundation. “Financing for Regenerative Agriculture.” (2024).*

In sum, each of these sources of finance for dairy climate solutions — dairy companies, financial institutions, government programs, impact investors and philanthropists — has an important role to play in creating holistic solutions that work well for farmers. They can bring their funds together through blended finance, an approach to structuring in which catalytic capital helps to bring more private investment into a sustainable project. Many of the models in this report incorporate blended finance and will enable greater collaboration and contributions from multiple partners.

This report expands on the financing options that currently exist for the adoption of sustainable practices and technologies on U.S. dairy farms and some models from other agricultural sectors. It outlines eight financial models currently available or in development by agricultural finance institutions and dairy companies, including input from dairy farmers, dairy cooperatives and processors, dairy customers and others throughout the value chain. The goal of this report is to share this thinking broadly across the dairy and finance sectors to foster increased collaboration and deployment of financial solutions that support dairy farmers in adopting new practices and technologies that generate both environmental and economic benefits for their farms and communities.



MODELS FOR THE U.S. DAIRY SECTOR

The Innovation Center for U.S. Dairy and Environmental Defense Fund facilitated several roundtables that explored a range of potential financial models designed to address the financial barriers within the dairy sector. These models are tailored for both individual dairy farmers and dairy cooperatives with the intention of execution at scale. Each model outlines its functionality, identifies the financial barriers it aims to mitigate, explains the benefits to dairy farmers and others in the dairy value chain, expounds on the advantages for lenders, discusses the factors critical for ensuring success and presents current accessibility and potential for scaling.

Financial models	High upfront capital costs	Additional ongoing operating expenses	Gaps between expense payments and receipt of funding	Risk associated with a newer practice/technology
Sustainability-Linked Loan		✓		
Sustainability-Linked Loan with Blended Finance	✓	✓	✓	✓
Green Loan	✓		✓	
Impact Fund	✓	✓	✓	✓
Program-Scale Bridge Funding	✓		✓	
Equity Investment	✓	✓		
Loan Guarantee				✓
Financial Solutions for Enteric Emission Reductions		✓		

MODEL 1: Sustainability-Linked Loan

What is it?

Sustainability-linked loans (SLLs) provide financing at a reduced interest rate if specific sustainability key performance indicators (KPIs) or goals are achieved. These KPIs and associated sustainability performance targets (SPTs) are developed by the borrower and approved by the lender as a condition to receiving lower interest rates. If the SPTs are not achieved, the interest rate will revert to the original rate. Otherwise, a penalty may be charged in some cases.

How does it work?

This finance model can be launched at any level: farmer, dairy cooperative or processor. Sustainability-linked loans are recommended to follow the five sustainability-linked loan principles.

Sustainability KPIs that the borrower is measured against to obtain an SLL can be derived from any environmental sustainability focus area, such as the reduction of GHG emissions, water efficiency, reduced energy usage, reduced waste or others.

To assess the progress and achievement of the identified sustainability goals, the lender and borrower would determine specific sustainability key performance indicators, or KPIs, to measure against associated sustainability performance targets (SPTs). The SPTs must be on the same timeline as the loan agreement.

Because of the financial institution's reliance on the accuracy of the data provided, companies using sustainability-linked loans often have verification requirements for their sustainability KPIs. For loans where information relating to SPTs is not made publicly available or otherwise accompanied by an audit/assurance statement, it is strongly recommended that a borrower seek an external review of its performance against its SPTs.²²

Five Sustainability-Linked Loan Principles

- 1. Selection of KPIs:** KPIs must be material to borrower's core sustainability and business strategy.
- 2. Calibration of SPTs:** SPTs must be set in good faith, remaining relevant and ambitious throughout the life of the loan.
- 3. Loan Characteristics:** An economic outcome is linked to whether the selected predefined SPT(s) are met.
- 4. Reporting:** Borrowers should report annual information to monitor performance of the SPT to the lender.
- 5. Verification:** Borrowers must obtain independent and external verification of their performance level against each SPT for each KPI.

Principles developed by The Loan Syndications and Trading Association, Loan Market Association, and Asia Pacific Loan Market Association Principles developed by The Loan Syndications and Trading Association, Loan Market

²² Loan Market Association, Asia Pacific Loan Market Association, Loan Syndications & Trading Association. 2019. "Sustainability Linked Loan Principles."

This ensures that the data is subject to review and allows for the issuance of an opinion as to whether the targets are successfully met.

How would financial barriers be addressed by this finance mechanism?

Farmers, dairy cooperatives and processors can receive lower-cost financing, which helps with the overall cost of the sustainability initiative. If the borrower chooses to reinvest its interest savings in their sustainability efforts and the source of finance is consistent over time (e.g. an operating line of credit) then the sustainability-linked loan can provide a consistent source of savings that can be used to address ongoing costs such as staff capacity, annual operating costs and more. A sustainability-linked loan is unlikely to be a sole source of funding for any initiative, but rather an added incentive for achieving sustainability goals. Sustainability-linked loans can be augmented through blended finance, which will be discussed in the next model.

FIGURE 2

Sustainability-Linked Loan



How would farmers and others in the dairy value chain benefit?

Dairy farmers, dairy cooperatives or processors receiving the sustainability-linked loan benefit from lower-cost financing. For companies who already have sustainability commitments, this financial model may be even more attractive because they can add lower-cost financing to their plan to achieve their sustainability goals.

How do lenders benefit?

Sustainability-linked loans are well-known, standard products in the broader financial sector, so lenders who offer SLLs are able to provide their customers with a product likely offered by their competitors. SLLs also enable lenders to build stronger relationships with highly valued customers and potentially attract new customers. SLLs can provide a framework for lenders to gain a deeper understanding of the sustainability initiatives undertaken by their customers and track performance over time. Finally, many sustainability initiatives are associated with reduced business risk and increased market opportunities, which makes that customer a better borrower.

What considerations should be given to ensure this financial model can be successfully implemented?

Given that the reduced interest rate is contingent on achieving the mutually agreed upon sustainability objectives, there is a risk that the borrowers may not achieve their targets. In that case, the baseline interest rate or a higher interest rate would be assessed on the loan.

When developing sustainability-linked loans and determining ambitious yet achievable targets, borrowers should consider different scenarios that could make them more or less able to achieve their goals. When implemented at the farm scale, financial institutions may want to collaborate with farmer groups, dairy companies, non-government agencies and others to design a common set of KPIs that would work for multiple farmers with similar production systems and loans.

How available and scalable is this financial model currently?

Sustainability-linked loans have already been implemented across the financial sector and by some financial institutions within the food and agriculture industry. Sustainability-linked loans have primarily been offered to large food companies and not dairy cooperatives and farmers. These loans are ready to be scaled for broader implementation in the dairy sector.

Sustainability-Linked Loans in Action:

Cooperative scale – CoBank and Heartland Co-op

In October 2024, CoBank launched its first sustainability-linked loan in partnership with its customer, Heartland Co-op. CoBank is one of the largest private credit providers to the U.S. rural economy and a part of the Farm Credit system. Heartland Co-op is a farmer-owned cooperative serving the grain, agronomy, energy and feed needs of their growers in Iowa, Nebraska and Texas. Heartland's Conservation Agronomy team helps their farmer customers select the right conservation practices for their operations and provides year-round service and expertise on conservation agronomy. They also help connect farmers with a variety of programs and financial incentives that enable them to adopt conservation practices. Through this partnership, Heartland Co-op will receive an interest rate reduction on its operating line of credit with CoBank if it achieves ambitious goals of implementing agricultural water quality practices and farmer engagement.²³ If achieved, the annual targets would lead to a 33% increase in annual cover crop acres sold, totaling approximately 98,000 acres in the final year of the agreement, over 200 new edge-of-field saturated buffers and bioreactors installed filter water and prevent nutrients from reaching Iowa streams, and a 39% increase in farmer engagement by Heartland's conservation agronomy team by 2028.

Farmer scale – FBN's Regenerative Agriculture Financing program

In 2022, the global farmer-to-farmer network and ag tech company Farmers Business Network® launched a new incentive program for farm operating loans. The Regenerative Agriculture Financing program (RAF) includes a 0.5% interest rate rebate for farmers who achieve climate and water quality benchmarks established by Environmental Defense Fund. When launched, the RAF program was quickly oversubscribed and became FBN's fastest-selling financial product to date. Both farmers who are early adopters and new adopters of regenerative practices were eligible to participate. Data was collected from 42,000 acres, and RAF farmers achieved average crop yields equal to or greater than national averages for corn, soybeans and wheat. Of the participating farmers, 83% who completed program requirements met environmental standards for fertilizer efficiency and soil health practices. Farmers who secured the rebate demonstrated that they applied nitrogen at levels that minimized the risk of loss to the air and water and implemented soil health practices. The initial \$25 million pilot fund was expanded in 2023 and is continuing to grow.²⁴

Targeted barriers

- Additional ongoing operating expenses

Implementation level

- Entity-scale, either direct to farmer or dairy cooperative/processor

Applicability by practice and farm size

- Manure management systems and feed additives, as well as other practices
- Small- to large-sized farms

Partners involved

- Lender
- Borrower – dairies, dairy cooperatives or processors

23 EDF. "CoBank originates its first sustainability-linked loan with Heartland Co-op with support from EDF" (2024).

24 https://www.edf.org/sites/default/files/2023-07/EDF_FBN_RAF_report.pdf

MODEL 2:

Sustainability-Linked Loan with Blended Finance

What is it?

Blended finance is the use of catalytic capital from public or philanthropic sources to increase private sector investment in sustainable projects.²⁵ Blended finance offers a structuring approach that enables organizations with different objectives to invest alongside each other while achieving individual objectives, whether generating a financial return, driving social impact, improving environmental outcomes or all of the above.²⁶

An agricultural finance institution can offer more substantial interest rate reductions or modifications of terms such as repayment timelines and acceptable risk if it is able to blend its funds with an external source of catalytic capital. This model can take many different forms, as the source of catalytic capital, blended finance structure and financial product modifications will vary. This model focuses on a bilateral blended finance relationship between the agricultural finance institution and the catalytic capital source.

How does it work?

This model would be launched as a collaboration between an agricultural finance institution and an external source of catalytic capital. It could be used to finance at the dairy farm, dairy cooperative or processor levels.

An agricultural finance institution would identify a source of catalytic capital that has shared goals for the sustainability objectives to be achieved. This source of catalytic capital could be from a consumer-packaged goods (CPG) company, a public funding program or a philanthropic or impact investment source. Importantly, for the source of external capital to be catalytic, it must offer a lower interest rate, more flexible repayment schedule or higher risk appetite (or a combination of those attributes) than the agricultural finance institution's existing capital. The participation from these parties improves the risk/return profile of the transaction to attract participation from the private sector.²⁷

The financial institution and catalytic capital source would align on the desired outcomes of the financing, the terms and structure of the loans offered to borrowers, the eligibility requirements and environmental or other impact reporting requirements. The blended finance could be managed in a variety of ways. This will depend on the organizational structure and legal guardrails associated with both partners and the chosen structure.

If the catalytic capital is designed to be revolving, it can continue to have an impact into the future. If catalytic capital is blended into loans, borrowers would pay back loans to the lender, who in turn contributes those funds back to the catalytic capital source or recycles them into new loans to borrowers. If catalytic capital is provided alongside loans, the borrowers would pay back catalytic capital directly to the provider of those funds (if not given as a grant), and repaid funds could also be reissued to new borrowers. This enables the catalytic funds to continue to spur impact into the future.

25 [“Convergence - the Global Network for Blended Finance”](#) (n.d.).

26 The Rockefeller Foundation. [“Financing for Regenerative Agriculture,”](#) (2024).

27 [“Convergence - the Global Network for Blended Finance”](#) (n.d.).

How would financial barriers be addressed by this finance mechanism?

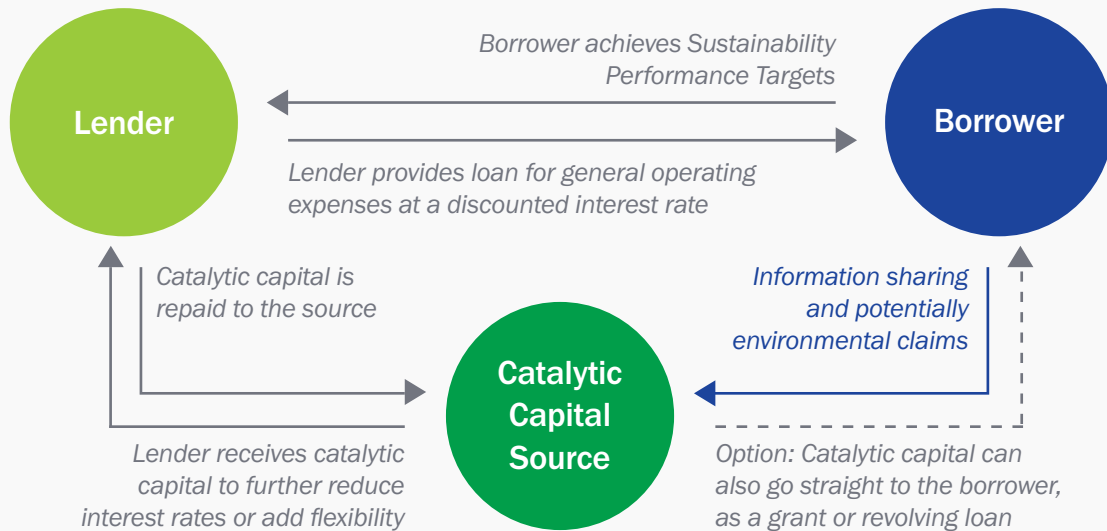
Blended finance is an approach to structuring, which means it can be designed to address a variety of financial barriers. For example, increased flexibility in the repayment schedule could alleviate the burden of high capital costs, additional operating costs, practices that are newer and have greater perceived risk or to provide gap funding for practice implementation. Lower-cost loans could support borrowers in managing ongoing expenses. Increased risk tolerance could enable the deployment of more innovative technologies and practices. However, this depends on the requirements and amount of catalytic capital that can be blended with the existing agricultural finance.

How would farmers and others in the dairy value chain benefit?

Dairy producers would benefit from having tailored financial products that meet their specific needs in adopting new practices and technologies. Downstream members of the value chain could be the source of the catalytic capital, enabling them to create a revolving pool of funds that can continuously generate positive benefits for farmers and the environment and make progress towards sustainable sourcing goals. Or, where there is a separate philanthropic, impact investment or government source of catalytic capital, the dairy value chain would benefit because they can connect producers with multiple sources of financial support.

FIGURE 3

Sustainability-Linked Loan with Blended Finance



How do lenders benefit?

Lenders benefit because they can tailor financial products to farmers' and other customers' needs beyond what is dictated by their existing capital requirements and risk tolerance. They can offer a lower interest rate, more flexible repayment terms or accept higher risk if the catalytic capital bears the cost and risk of doing so. This allows lenders to more proactively meet the needs of their customers. It can also enable them to try new financial products with minimal risk. They may discover those products can be scaled with less catalytic capital or in the absence of catalytic capital once they have established a track record with the new product.

Targeted barriers

- High upfront capital costs
- Additional ongoing operating expenses
- Gaps between expense payments and receipt of funding
- Risk associated with a newer practice/technology

Implementation level

- Entity-scale, either direct to farmer or dairy cooperative/processor

Applicability by practice and farm size

- Manure management systems and feed additives
- Small- to large-sized farms

Partners involved

- Lender
- Catalytic capital provider
- Borrower – dairies, dairy cooperatives or processors
- Third-party fund manager (if applicable/desired)

What considerations should be given to ensure this financial model can be successfully implemented?

There are several considerations for the successful deployment of this financial model. First, the blended finance product itself must be designed to meet the financial needs of farmers. This model offers high flexibility, which should be utilized to create financial products targeted to the barriers farmers face in adopting and maintaining climate-smart practices and technologies. Second, the source and amount of catalytic capital are likely to bring requirements for impact measurement or other criteria, which the financial institution and any other partner organizations must understand and evaluate whether they will be feasible to meet. Third, different financial institutions and catalytic capital sources will have different legal requirements and boundaries around how the blended finance is structured that must be navigated.

How available and scalable is this financial model currently?

The main barrier to this financial model is the availability of catalytic capital. Funding for climate-smart agriculture is typically delivered as cost-share or practice payments, rather than through financing – even though those funds could potentially deliver more impact as they continue to revolve through time. Dairy companies, philanthropies and government programs should all consider whether a portion of their investments in climate-smart agriculture might be more effective if deployed as low-cost revolving funds. Importantly, the EPA's Greenhouse Gas Reduction Fund offers a major source of such funding that could help to launch new blended finance models in agriculture.

Sustainable Loans with Blended Finance in Action: Starbucks Global Farmer Fund

The Starbucks Global Farmer Fund commits \$50 million to providing financial support to coffee farmers globally. To facilitate this financing, Starbucks collaborated with various lending partners located in thirteen countries in South America and Africa. These lending partnerships enabled Starbucks to expand the financial support provided to coffee producers by issuing loans designated for agronomy, restoration and infrastructure improvements. Farmers also received technical support through training on agronomy best practices, business planning and risk management. The Global Farmer Fund helps coffee farmers manage risk, strengthen their businesses and advance sustainability efforts within the coffee industry.²⁸

28 Starbucks. "Investing in sustainable coffee communities" (n.d.).

MODEL 3: Green Loan

At a glance / Brief overview

Green loans are any type of loan instrument made available exclusively to finance or re-finance, in whole or in part, new and/or existing eligible green projects. The fundamental determinant of a green loan is the use of the loan proceeds — in other words, the total amount of the loan — for the green project. This may include other related and supporting expenditures. The environmental benefits of the green project are assessed by the borrower.²⁹ Green loans may provide favorable financial terms, like an interest rate discount.

The core difference between a sustainability-linked loan (SLL) and a green loan is that the SLL is a general-purpose loan whose interest rate reduction is based on achievement of SPTs, whereas the green loan is more akin to project finance and is specifically designed to finance the green project.

How does it work?

Individual farmers, dairy cooperatives or processors could apply for green loans to finance projects with tangible environmental benefits.

A green loan is managed by financial institutions and is recommended to follow the four green loan principles.

To qualify for a green loan, the project must meet certain environmental criteria defined by the lender. This could include expenses associated with practices and technology that reduce dairy methane emissions.

Borrowers typically need to submit a detailed proposal outlining the project's environmental benefits, financial projections and how the funds will be used. Lenders could also compile information on the environmental benefits and associated financial projections for a selection of eligible green practices or technologies. This proposal would then be used to assess a project's viability and its alignment with green loan standards.

Four Green Loan Principles

- 1. Use of Proceeds:** Designated projects provide clear environmental benefits
- 2. Process for Project Evaluation and Selection:** Borrowers of green loan communicate how loan is organized and potential environmental and social risk of project
- 3. Management of Proceeds:** Proceeds should be tracked to maintain transparency
- 4. Reporting:** Report qualitative performance indicators and quantitative performance measures

Principles developed by The Loan Syndications and Trading Association, Loan Market Association, and Asia Pacific Loan Market Association.

²⁹ Loan Market Association, Asia Pacific Loan Market Association, and Loan Syndications & Trading Association. "[Green Loan Principles](#)." (2019).

The proposed projects are required to have demonstrated environmental advantages and commit to reporting qualitative and quantitative performance measures. Some lenders may require third-party verification to confirm the project meets the necessary environmental standards. This adds an extra layer of accountability and transparency.

Green loans can come with favorable terms to encourage sustainable investments. These terms might include lower interest rates, longer repayment periods or other incentives. The specific terms can vary depending on the lender and the nature of the project.

Similar to the discussion of the SLL in the previous two financial models, an agricultural finance institution can offer more substantial interest rate reductions or modifications of terms such as repayment timelines and acceptable risk for green loans if it is able to blend its funds with an external source of catalytic capital.

FIGURE 4

Green Loans



How would financial barriers be addressed by this finance mechanism?

Green loans can provide the necessary capital to cover the initial investment and/or ongoing operational costs required for sustainability projects and are particularly beneficial for projects that require high capital expenditures. This is because the loan is specifically for the costs of the green practice or technology, therefore it must be worth the farmers' time to get a separate loan for those costs. By offering lower interest rates and/or longer repayment terms, these loans make it more affordable for farmers to adopt new technologies and practices while distributing the investment cost over time. Additionally, some green loans may offer flexible repayment schedules that align with the farm's cash flow.

How would farmers and others in the dairy value chain benefit?

Dairy farmers, dairy cooperatives or processors can secure funding for climate-smart practices at reduced interest rates and other favorable financing terms, facilitating the adoption of methane-mitigating practices while avoiding excessive financial and reporting burdens.

How do lenders benefit?

Projects financed through green loans often involve sustainable practices that can reduce a variety of risks, from financial to reputational. Some practice and technology changes can lead to cost savings and efficiency gains, improving the financial performance of borrowers and reducing default risks. In addition, many sustainability initiatives are associated with reduced business risk and increased market opportunities, which makes that customer a better borrower.



Targeted barriers

- High upfront capital costs
- Gaps between expense payments and receipt of funding
- Risk associated with a newer practice/technology

Implementation level

- Entity-scale, either direct to farmer or dairy cooperative/processor

Applicability by practice and farm size

- Manure management systems and feed additives
- Small- to large-sized farms

Partners involved

- Lender
- Borrower – dairies, dairy cooperatives or processors

What considerations should be given to ensure this financial model can be successfully implemented?

Green loans require documentation and periodic reporting to review whether the project is on track to generate the planned environmental benefits. Borrowers or lending partners would need to possess the necessary resources to monitor, track and assess the environmental impacts of the project and subsequently provide this documentation to lenders. Project partners should also consider additional sources of funding that can augment the green loan. This could include traditional government cost-share payments to reduce the overall cost of the project, or it could be a blended finance arrangement with a catalytic capital provider to enable the lender to offer more favorable terms as part of the green loan itself.

How available and scalable is this financial model currently?

Green loans are currently available in financial markets, however, they have not yet been deployed widely in agricultural contexts. There is significant potential for scalability within the dairy sector.

MODEL 4: Impact Fund

What is it?

An impact fund is another blended finance approach, but one that facilitates collaboration among multiple parties. One or more catalytic capital providers contribute to a fund, which is managed by a fund manager or financial institution. Funds are then used as part of blended finance solutions with lending institutions to offer loans with favorable terms to farmers, cooperatives or processors. When loans are repaid, the catalytic capital portion can be recycled back into the fund to revolve into new loans. This model enables multiple catalytic capital sources, financial institutions and members of the dairy value chain to participate.

How does it work?

Catalytic capital is contributed to the fund by one or more dairy companies, government agencies or philanthropic sources. To be catalytic, the capital must be lower-cost and/or more flexible than current market rates for agricultural finance. This fund is either managed by the lender or a fund manager.

The source of catalytic capital directs what practice changes or environmental outcomes the funds can be used for, which could include various methane reduction practices that could be implemented by dairy farmers in their value chain.

The fund manager would support the administration of the fund. This function is particularly necessary when a variety of participants are involved with different requirements around financing structure and environmental reporting. Outcomes measurement and environmental reporting requirements would be determined by the catalytic capital source.

Eligible borrowers could consist of farmers, dairy cooperatives or processors, depending on the design and goals of the fund. The financial institution(s) and catalytic capital source(s) would align on the desired outcomes of the financing, the terms and structure of the loans offered to borrowers, the eligibility requirements and environmental or other reporting requirements, which would then be administered by the fund manager.

There are a variety of ways the fund and associated loans could be structured. For example, the catalytic capital source could deploy its funds to the financial institution to be directly managed, or the catalytic capital funds and commercial capital could be deployed alongside each other in tandem. This will depend on the organizational structure and legal guardrails associated with partners and the chosen structure and governance for both the fund and the associated loans. The fund would likely be designed to revolve, with borrowers paying back loans that replenish the impact fund, enabling additional lending to commence.

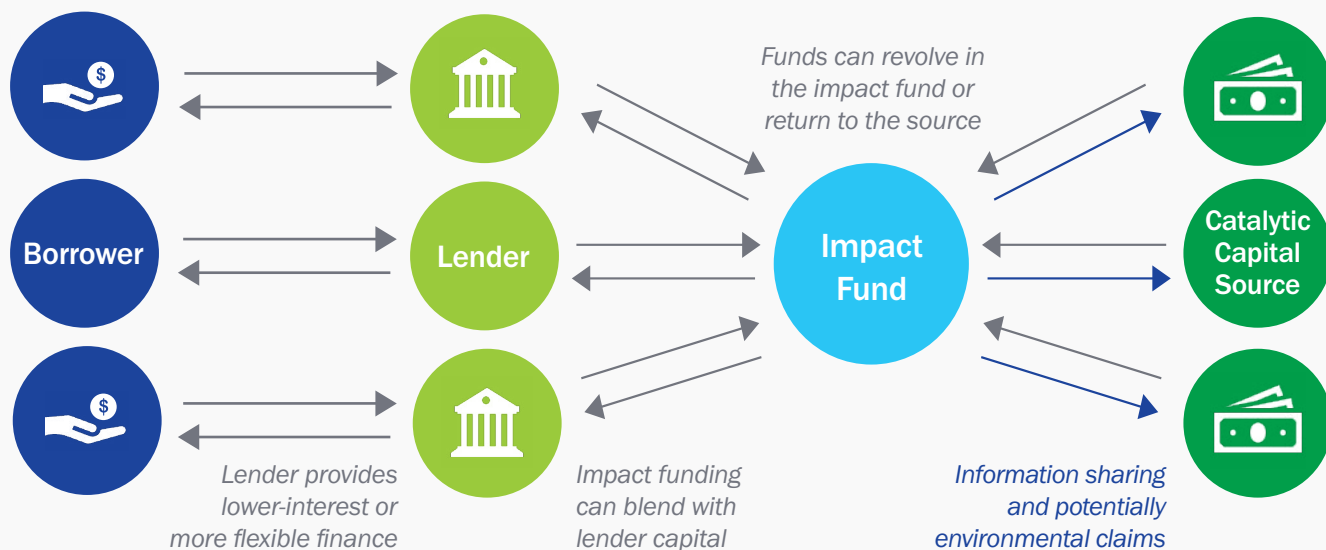
By combining sources of capital, the fund can allow financial institutions to deploy loans with lower interest rates and more flexible terms, enabling borrowers to adopt new practices or technologies at a much wider scale.

How would financial barriers be addressed by this finance mechanism?

Dairy farmers would be able to access capital with reduced interest rates and other favorable borrowing terms. These funds could be used for capital costs, operating costs or to provide gap funding for practice implementation, depending on the use specifications of the impact fund. Additionally, the introduction of catalytic capital can support risk reduction when implementing new practices and technology.

FIGURE 5

Impact Fund



How would farmers and others in the dairy value chain benefit?

Companies in the dairy value chain may be investors in the impact fund, and farmers, dairy cooperatives and processors could be recipients of financing from the fund. Dairies, dairy cooperatives and processors that are recipients of this financing would have access to tailored financing to overcome financial barriers to climate-smart practices and technologies. Companies in the dairy value chain that choose to invest would be leveraging additional private finance from agricultural finance institutions. They also may be able to make environmental claims for reductions achieved and can generate continuous progress through the revolving nature of the fund.

How do lenders benefit?

Lenders benefit because they can tailor financial products to farmers' and other customers' needs beyond what is dictated by their existing capital requirements and risk tolerance. They can offer a lower interest rate, more flexible repayment terms or accept higher risk if the catalytic capital bears the cost and risk of doing so. This allows lenders to more proactively meet the needs of their customers. It can also enable them to try new financial products with minimal risk. They may discover those products can be scaled with less catalytic capital or in the absence of catalytic capital once they have established a track record with the new product.

Lenders also benefit when there is an aggregated source of catalytic capital that they can access through the fund, rather than having to negotiate multiple smaller deals. When opportunities can be standardized and accessed efficiently, more lenders will be able to participate.

Targeted barriers

- High upfront capital costs
- Additional ongoing operating expenses
- Gaps between expense payments and receipt of funding
- Risk associated with a newer practice/technology

Implementation level

- Entity-scale, either direct to farmer or dairy cooperative/processor

Applicability by practice and farm size

- Manure management systems and feed additives, determined by investing organization
- Small- to large-sized farms

Partners involved

- Lender
- Investing company (dairy buyer)
- Borrower – dairies, dairy cooperatives or processors
- Third-party fund manager (if applicable/desired)

What considerations should be given to ensure this financial model can be successfully implemented?

There are several considerations for the successful deployment of this financial model. First, it is the most complex model included in this report, and while it has the potential to reach a much bigger scale than some of the other models, it will also require multiple catalytic capital sources and financial institutions to align the priorities and requirements of the fund. Second, it is essential that the designers of the fund remain grounded in how the ultimate financial products delivered to farmers will support them in overcoming financial barriers to new practice and technology implementation. Third, the source(s) and amount of catalytic capital is likely to bring requirements for impact measurement or other criteria, which the financial institution and any other partner organizations must understand and evaluate whether they will be feasible to meet. Finally, different financial institutions and catalytic capital sources will have different legal requirements and boundaries around how the blended finance is structured that must be navigated.

How available and scalable is this financial model currently?

This model is ready to be activated and would require the structure to be developed between the catalytic capital source(s) and lender(s). It could be scaled broadly, depending on the size of the impact fund and the ability of participants to align their expectations and conditions to effectively collaborate.

Impact Funds in Action: The AGR13 Fund

AGR13 is a blended finance fund that provides partial risk guarantees and credit enhancement instruments to partner banks to catalyze finance in sustainable land use projects. The mission of AGR13 Fund is to mobilize public and private capital at scale to support sustainable agriculture and avert deforestation. To do this, the fund partners with different types of financial institutions active in developing markets. The fund provides guarantees to financial institutions that provide credit to support eligible projects and businesses. A technical assistance facility has also been established to accelerate the development of investable opportunities and maximize their impact. The fund supports transactions actively preventing deforestation, stimulating reforestation, contributing to efficient sustainable agricultural production and value chains with reduced carbon emissions, and supporting rural livelihoods with improved income and employment opportunities.³⁰

30 [AGR13 Fund \(2023\)](#).

MODEL 5: Program-Scale Bridge Funding

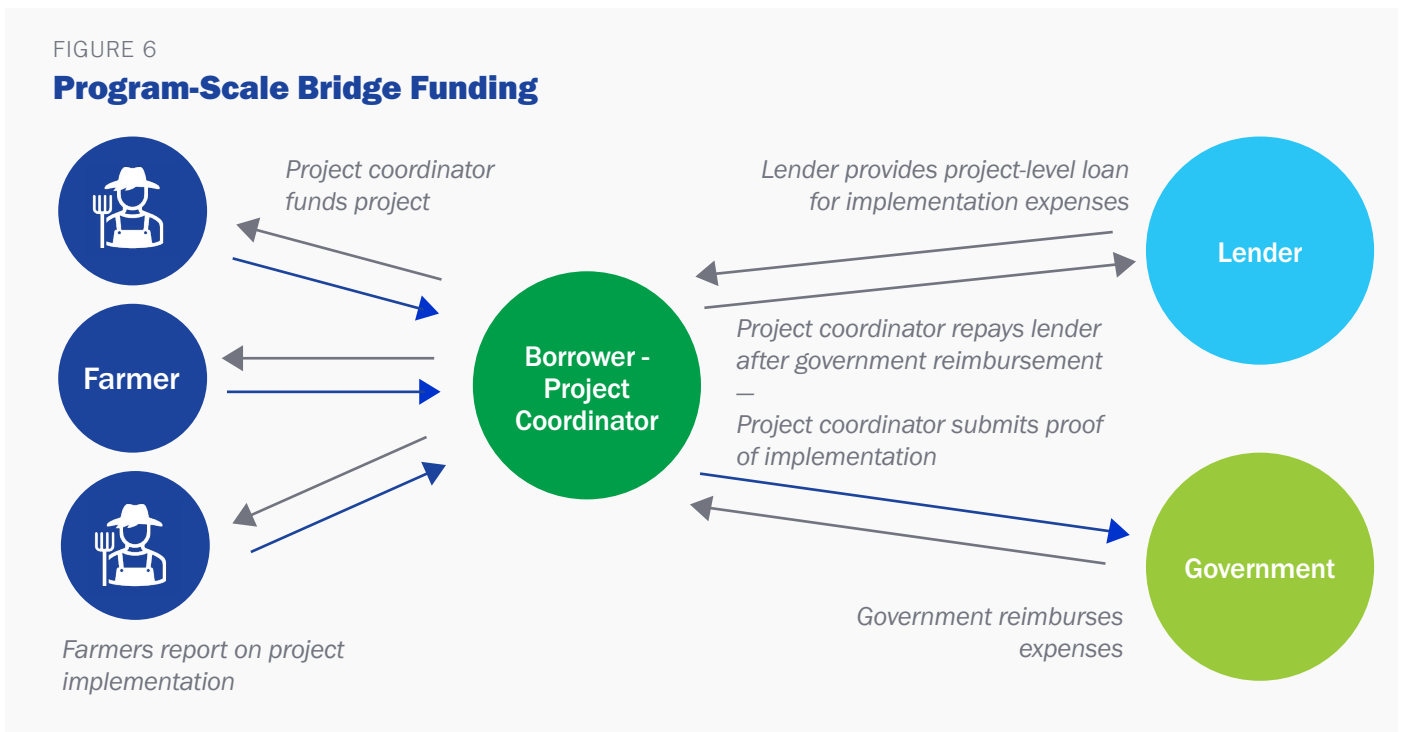
What is it?

Bridge funding is a type of short-term financing used to cover the costs associated with the implementation of new practices and technologies when funding is available on a reimbursement basis, which is particularly common with government funding sources. Many dairy farmers access bridge funding at an individual level from their own lender. However, this is inefficient when many farmers have the same financial need, and it also places the burden of acquiring the financing solely on the farmer. For larger projects involving many farmers, bridge funding could be provided at the program level instead of the individual farmer level. This would require a program coordinator to facilitate the bridge funding on behalf of participating farmers, enabling farmers to easily access funding for the new practice or technology at the time that their expenses occur.

How does it work?

This financial model is designed for farmers receiving grant or cost-share funding for implementation of a new practice or technology (e.g., funding from PCSC, RCPP, etc.). When implementing a new capital project a down payment is often required, and many farms need interim funding until they receive grant funds for these practice changes. Until the grant funds are disbursed, the finance sector often provides bridge financing to cover the interim period.

To streamline capital distribution, bridge funding could be implemented at the programmatic level either alongside program coordination partners or loaned directly to those partners. If implemented alongside those partners, lenders and grant implementation partners could collaborate to channel funding to farmers that need it. The lender and funding partner may choose to set up the loan directly with the implementation partner, who can disburse the funds to grant recipients or even purchase necessary equipment or supplies on their behalf and deliver it directly to them.



Targeted barriers

- High upfront capital costs
- Gaps between expense payments and receipt of funding

Implementation level

- Program-scale, either to grant administrators / implementation partners or direct to farmers

Applicability by practice and farm size

- Manure management systems and feed additives
- Small- to medium-sized farms

Partners involved

- Lender
- Grant funder
- Grant recipients — dairies, dairy cooperatives or processors

In either model, risk would likely be lowered for the lender with the implementation partners' involvement in identifying dairy farmers that will incur reimbursable project expenses. In the latter model, the lender's loan structure is simplified from many borrowers to one.

Outcomes measurement and environmental reporting requirements would be determined by the grant provider to meet governmental program eligibility.

How would financial barriers be addressed by this finance mechanism?

Receiving grant funds can be a protracted process. There is often a gap between the timing of funding and the implementation of the intervention. To facilitate progress and reduce the upfront capital cost burden on farmers, financial institutions can provide bridge funding while the grant disbursement is pending. This would eliminate the need for individual farmers to seek out lenders independently and reduce the farmers' need to provide their own capital, supporting small and medium-sized farmers that may have less capital available to support such expenses. Furthermore, government payments can be assigned to the lender, guaranteeing repayment.

How would farmers and others in the dairy value chain benefit?

This framework solves a cash flow problem inherent in paying for a practice or technology that will be reimbursed later and facilitates more rapid implementation. This model bridges implementation gaps, enabling farmers to initiate their practice changes more swiftly. Additionally, it reduces the risk of initial capital outlay being required from farmers while they await funding.

How do lenders benefit?

By providing program-level bridge funding in anticipation of grant disbursements, lenders can effectively reduce risk on their investment. Given that projects are being funded by grants, lenders are assured that their financial exposure is minimized. With the short-term nature of bridge financing, lenders benefit from a faster repayment process.

What considerations should be given to ensure this financial model can be successfully implemented?

This model is designed primarily for small to medium-sized farms who may lack the working capital to fund new practices or technologies prior to being reimbursed. An important consideration is the relationship between the farmers, the implementation partner, the finance provider and the grant or cost-share provider. The implementation partner could be a dairy cooperative, non-profit organization or other entity with relationships with farmers and the ability to administer a project with multiple farmer participants. One barrier is that government funding sources typically do not cover interest expenses, so the implementation partner and finance provider would need to find another way to cover that expense.

How available and scalable is this financial model currently?

This model is ready to scale. As grant funding continues to be disbursed, a pivotal opportunity is presented for the financial sector to engage with the dairy industry, promoting sustainability while ensuring a secure investment.

MODEL 6: Equity Investment

At a glance/ Brief overview

An equity investment enables investors to obtain a stake in companies (in this case, a farm business) by purchasing shares. While most farm-level finance takes the form of debt, there are some equity models that can be applicable to sustainability practices and technologies. An equity investment increases the amount of capital the farm has to work with and also improves their capacity to acquire debt, which can enable them to take on new practices or technologies more rapidly or at a larger scale.

How does it work?

Investors provide financial assistance in the form of equity to farmers, which is then recorded on farmers' balance sheets. The equity is issued with an agreement set forth among the farmer and investor on repayment options and timeframe. The farmer can then buy out the equity investors or roll the investment over into a term loan if it is not repaid within the specified time frame set forth in the investment agreement.

The farmer and equity investor would agree on the use of the equity investment and any environmental reporting required.

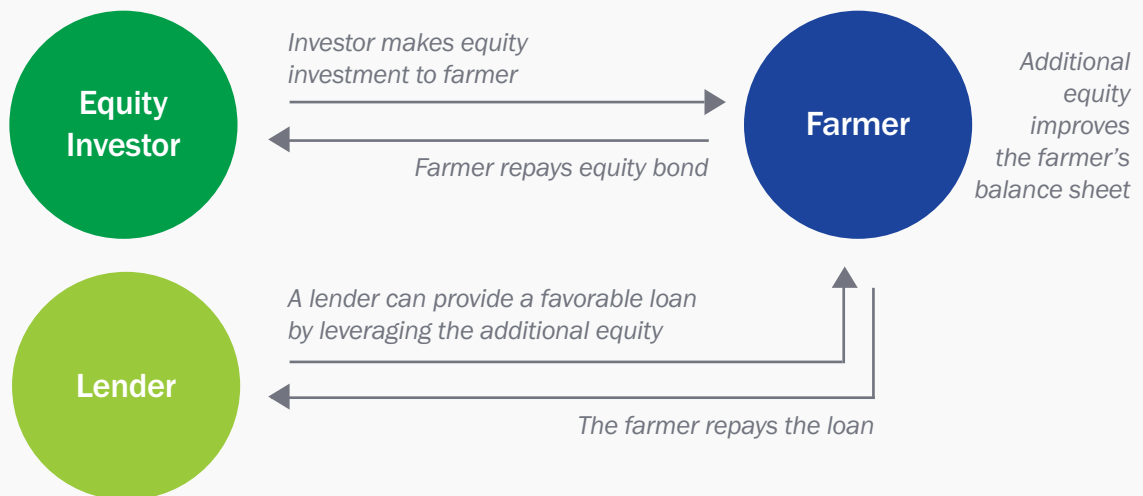
This model is applicable to the farmer level. Considering whether it could apply to the dairy cooperative or processor level was beyond the scope of this report.

In addition to being able to use the equity investment itself on sustainability practices or technologies, the equity boosts a farmer's financial ratios, and thus, a farmer can attract private lenders in securing more favorable loans because the injection of equity mitigates the lender's risk and improves the farmer's creditworthiness. The equity recorded on a farmer's balance sheet enables the farmer to take on more substantial projects and allows the lender to offer more favorable loan terms.

Once the farmer buys back the equity investor's share of the business, the equity can become available for revolving investments in other farmers and projects.

FIGURE 7

Revolving Equity



How would financial barriers be addressed by this finance mechanism?

This financial model increases a farmer's ability to fund larger projects with the equity investment and to obtain favorable debt financing at the same time. It may be particularly attractive for technologies with high up-front capital costs or for farms nearing their debt capacity limit and are unable to access additional finance. Of course, equity investments should be considered in the context of the farmers' overall financial picture and should not be extended in situations where a farm could become over leveraged and unable to repay debt.

How would farmers and others in the dairy value chain benefit?

Farmers and others in the dairy value chain benefit by adding another financial tool that can address the barriers described above.

How do lenders and investors benefit?

Investors

Equity offers an additional opportunity for investors to fund dairy practices and technologies. This type of investment would likely be of interest to a separate and additional set of investors, generating more capital overall for dairy sustainability initiatives.

Lenders

Lenders can mitigate the risk associated with their financing by securing it against the equity provided by the farmers. This additional equity acts as collateral to the lender which reduces the risk for lenders when issuing loans to farmers, enabling them to make loans they may not have otherwise.

What considerations should be given to ensure this financial model can be successfully implemented?

This financial model relies on investors committing to offering equity investments that align with farmers' needs and any return expectations associated with the new practices or technologies. In addition, this financial model requires farmers to repay both the equity investment and the loan provided by lenders. Although this arrangement reduces the initial capital burden for implementing sustainability measures, a farmer must generate additional revenue to fulfill their repayment obligations to both parties. This requires a thorough understanding of the farm's full financial situation and an accurate assessment of financial projections for the future. Farmers can capitalize on established, trusted relationships with current lenders to secure the necessary loans and navigate the different repayment requirements to ensure their financial security.

How available and scalable is this financial model currently?

This financial model is active in the agriculture sector. One current program, profiled below, supports beginning farmers by providing the essential capital needed to establish themselves. Additional models allow farmers to purchase farmland.³¹ However, there is potential to expand its application to include sustainability interventions within the dairy industry.

This model can have broader utilization because it leverages conventional underwriting standards. Equity is a prerequisite for lenders to issue loans; when equity is supplied through this financial model, lenders can maintain their existing underwriting criteria, while advancing sustainability efforts within the dairy industry.

³¹ [Fractal Agriculture](#) (n.d.).



Targeted barriers

- High upfront capital costs
- Additional ongoing operating expenses

Implementation level

- Entity-scale, direct to farmer

Applicability by practice and farm size

- Manure management systems
- Small- to large-sized farms

Partners involved

- Borrower — dairies
- Investors
- Lender

Revolving Equity Investments in Action: Farm Credit’s FarmStart Program

For over 15 years, Farm Credit’s FarmStart program has utilized private capital in the form of equity to enhance creditworthiness for hundreds of farmers, predominantly aiding new and small-scale farmers. This model is funded by investors who are interested in making equity investments in young farmers’ businesses as start-up capital. The investment model provides eligible farmers with up to \$75,000 on their balance sheet. The \$75,000 allows the financial institution to follow normal underwriting procedures to make a loan because the capital investment improves the farmer’s creditworthiness. In addition, the \$75,000 is a five-year bond that is non-recourse, subordinated debt. As nonrecourse, if the farmer faults on the loan, there is no collateral required to repay the loan. Repayment of these loans can replenish a revolving fund, perpetuating the capital investments in new farmers. The improved attractiveness to financial institutions aids farmers in securing more favorable and long-term loans while protecting the financial stability of new farmers.³²

32 Pike, D., Gauthier, V., Monast, M., Bloomgarden, E., Environmental Defense Fund, & Climate and Forest Capital, LLC.. “Catalytic capital and agriculture” (2020).

MODEL 7: Loan Guarantee

What is it?

Loan guarantees serve as a risk-reduction tool to attract market-rate lending. Guaranteed loans are backed by third parties that assume the responsibility to repay a portion of the loan on behalf of the borrower if the borrower defaults. This assurance significantly reduces the risk for lenders and even for guarantors with a portfolio of guarantees, as typically only a few loans default. Guarantees can enable finance to flow to borrowers or projects considered risky.

How does it work?

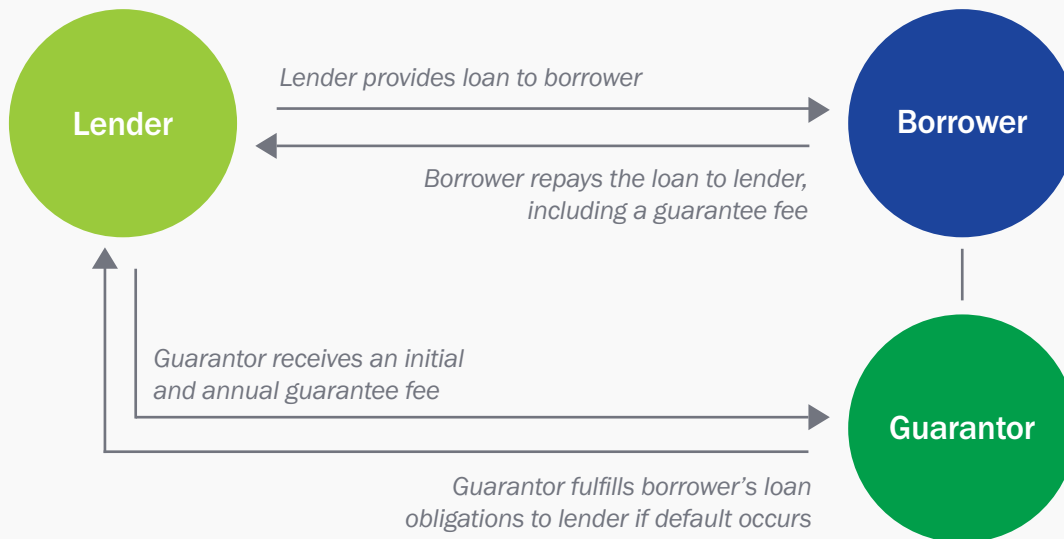
This financial model is implemented in collaboration with individual farmers, their lender and their guarantors.

A guarantee incorporates an additional layer of risk mitigation for a lender. This added layer involves a guarantor who assumes the debt in the case of a borrower defaulting on their loan to a lender. This financial mechanism enhances the confidence of financial institutions by ensuring that a portion of the loan will be repaid in case of default, either from the borrower or guarantor.

For example, the USDA Farm Service Agency (FSA) offers guarantees for operating loans, farm ownership loans and conservation loans up to \$2.2 million (adjusted annually based on inflation) and up to 95 percent against possible financial loss of principal and interest.³³ For FSA guarantees, a borrower is only eligible if they cannot receive a loan otherwise, except for the conservation loan guarantees which are eligible to any commercial borrower.

FIGURE 8

Guaranteed Loans



33 USDA. "Guaranteed farm loans" (n.d.).

This enables lenders to offer loans to farmers with poorer credit positions. USDA Rural Development also offers business and industry (B&I) loan guarantees to lenders for their loans to rural businesses. B&I loans approved in fiscal years 2024 and 2025 will receive an 80 percent guarantee.³⁴

Interest rates are typically negotiated between the lender and borrower, and rates may be fixed or variable. For FSA loan guarantees, interest rates are subject to FSA's interest rate caps.

A variation on these programs is to develop loan guarantees specifically for climate-smart agriculture. Such guarantees could have multiple benefits: they could enable farms with poorer credit positions to implement climate-smart practices or technologies, they could mitigate the risk of newer climate-smart practices or technologies and they could enable lenders to offer lower interest rates because of the reduced risk. Outcomes measurement and environmental reporting requirements would be determined by the guarantor.

The guarantor could be a government funding source or a private capital source. The guarantor typically charges a guarantee fee or guarantee commission which ranges from 0% to 3.75% of the guaranteed portion of the loan.

How would financial barriers be addressed by this finance mechanism?

Guarantees provide dairy farmers with enhanced opportunities to secure additional capital when risk is a barrier to finance. By involving a guarantor who pledges their assets as collateral, these agreements enable farmers to access necessary loans for implementing sustainable practices beyond what direct lenders may be able to offer. A farmer can utilize a guarantor to secure financing if the farmer requires a credit enhancement or if the sustainable practice is nascent and riskier from a financing perspective. In these situations, dairy farmers can more readily meet the substantial capital requirements associated with adopting new technologies.

How would farmers and others in the dairy value chain benefit?

Farmers and others in the dairy value chain benefit by increasing access to capital for farms and/or practices and technologies perceived as risky.

How do lenders benefit?

The premise of a guaranteed loan is to reduce the risk for the lender by having another party offer collateral. However, that risk often does not materialize, as guaranteed loans demonstrate more stable performances and lower delinquency rates. For the FSA loan guarantee program, guaranteed loans granted to farmers in Iowa revealed that only 0.24% of the loans were delinquent, or 0.01% of the value of the portfolio.³⁵ Overall, guaranteed loans provide a financial mechanism for lenders to mitigate potential losses, which enables them to extend their credit offerings for steadier financial performance.

What considerations should be given to ensure this financial model can be successfully implemented?

A guarantee mechanism is designed to distribute risk among various counterparties. For guarantees to be successful, external parties must be prepared to assume a share of the risk. An additional consideration in designing guarantees for climate-smart agriculture is to analyze the extent to which the guarantees will facilitate greater financing of projects and/or reduce interest rates and whether that will be sufficient to motivate farmer adoption. If risk is not the barrier to greater adoption, a guarantee is not the right financial tool to increase adoption.

34 USDA. "Business & Industry Loan Guarantees" (n.d.).

35 Murphy, D. "Young Farmer Finance Schemes" (2012).

Targeted barriers

- Risk associated with a newer practice/technology

Implementation level

- Entity-scale, direct to farmer

Applicability by practice and farm size

- Manure management systems
- Small- to medium-sized farms

Partners involved

- Borrower — dairies
- Guarantor
- Lender

How available and scalable is this financial model currently?

Guarantees are a widely implemented financial model and are currently scalable. Furthermore, new considerations for “sustainably focused” guarantee models are now arising. The Green Guarantee Company offers guarantees to companies in developing countries based on specific impact areas, including increased climate adaptation and mitigation projects.³⁶ Sustainability-linked guarantees, similar to sustainability-linked loans, have also emerged as Northern European finance group SEB began launching sustainability-linked guarantees with its customers, offering discounted guarantee fees if established sustainability targets are met.³⁷

36 The Green Guarantee Company. “Home” (n.d.).

37 SEB. “SEB broadens the range - Sweco first with sustainability-linked guarantee” (n.d.).

MODEL 8: Financial Solutions for Enteric Methane Emission Reductions

What is it?

Enteric methane emissions, which are released during the digestive process of ruminants, constitute the single largest source of agricultural methane emissions. This represents a significant opportunity for the dairy industry to implement targeted interventions to mitigate these emissions. Among the various strategies under development to reduce enteric emissions, the most prevalent interventions are feed additives. Feed additives, when consumed by ruminants, serve as a strategic method for reducing enteric emissions by inhibiting methane production.

Feed additives are still a relatively new technology and many are still under development. Although several companies produce feed additives, their market penetration remains low. A major barrier to broader adoption is the high cost of these additives and the ongoing debate regarding who should absorb this additional expense. This model presents the current emerging approaches to funding feed additives for enteric emissions reduction.

How does it work?

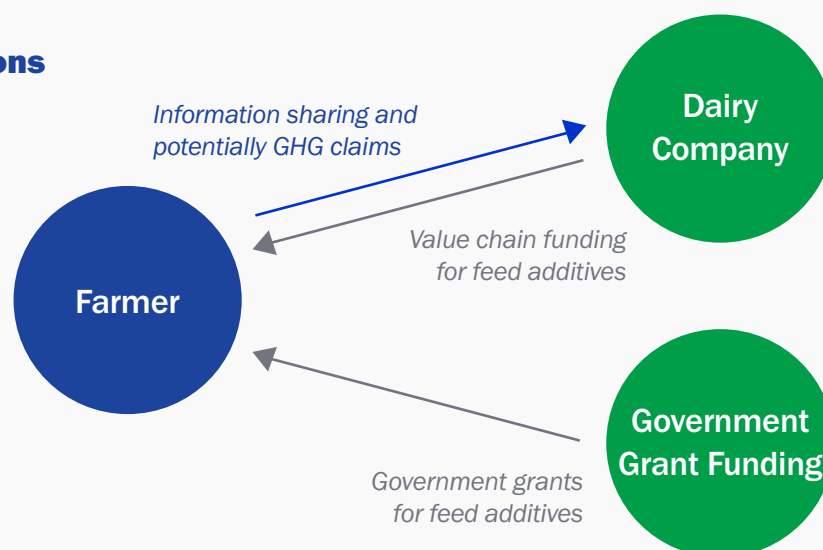
Feed additives can be effective at reducing greenhouse gas emissions, yet most do not generate financial or productivity benefits for dairy farms. For this reason, farmers are often not willing to pay for this additional expense out of pocket.

Many feed additives are not profitable unless the emission reductions they generate are incentivized through value chain payments, government funding programs or carbon markets. Consequently, a collaborative effort among value chain partners and various grant funding programs is essential to cover the cost for dairy farmers to implement feed additives and to encourage widespread adoption.

Dairy food companies, along with other industry partners, can play a key role in enhancing the adoption of feed additives. Companies that have established climate targets and sustainability objectives stand to gain considerably if their suppliers implement feed additives. Therefore, active financial contributions from these companies could catalyze this intervention on a global scale. Additionally, because feed additives present such a significant

FIGURE 9

Enteric Emissions



Targeted barriers

- Additional ongoing operating expenses

Implementation level

- Entity-scale, direct to farmer

Applicability by practice and farm size

- Feed additives
- Small-to large-sized farms

Partners involved

- Grant recipients
 - dairies
- Value chain funder
 - CPG, dairy cooperative / processor
- Grant funder

opportunity for the dairy industry to decarbonize, several grant opportunities aim to encourage this practice.

To be able to claim GHG reductions within their corporate inventories, dairy companies funding feed additives within their value chain may require specific measurement and reporting to ensure desired outcomes are achieved.

In the long term, reducing the cost of feed additives for enteric methane emissions reduction will be key.

How would financial barriers be addressed by this funding mechanism?

Incentive payments for feed additives would help to fund these new ongoing expenses, especially when the feed additives used do not increase productivity or provide any direct financial benefits.

How would farmers and others in the dairy value chain benefit?

Enteric emissions are one of the most significant sources of emissions for dairy farms. As new enteric methane-reducing technologies emerge and become available and viable for farmers to adopt, the dairy value chain can develop incentive programs to support broad implementation which can support the dairy value chain's strategy to achieve its net zero targets. For value chain partners with their own GHG reduction targets, providing funding for feed additives creates the potential for them to claim the emissions reductions for their own GHG accounting.

How do lenders benefit?

Currently, agricultural finance institutions do not have a direct role in this model. However, lenders to dairies should be informed about this rapidly emerging climate solution and opportunities for dairies to participate in funding programs for feed additives.

What considerations should be given to ensure this funding model can be successfully implemented?

Given that feed additives would need to be fed to dairy cows continually, the dairy industry may consider how to best incorporate a revolving structure into the current funding model for feed additives.

For example, funding pools may be developed for enteric emissions reductions able to generate revenue from value chain payments (insets) or carbon credits from companies outside the dairy value chain (offsets). Such payments would create a new revenue stream for farmers, enabling the feed additive funding model to shift — instead of grants or value chain partners funding the additives each year, they may consider “seed” funding that only provides one year of payments. Once farmers are “reimbursed” by the carbon outcome payments, that payment can be rolled into the next month's or year's feed additive costs.

This concept is similar to bridge funding. For detailed information on how financial institutions can support dairy farmers in leveraging existing grant funding for feed additives, please refer to Model 5: Program-Scale Bridge Funding. This resource outlines a strategy for financial backing to facilitate the integration of feed additives in dairy operations.

How available and scalable is this funding model currently?

This model is currently available for one feed additive that the FDA recently allowed to be used on dairy farms. Many others are in development but have not yet submitted testing information to the FDA, which prevents scaled implementation of those technologies in the U.S. dairy market.

ACTIVATING COLLABORATION ON DAIRY FINANCE SOLUTIONS

This report demonstrates various financial models that can effectively alleviate financial barriers to adopting GHG-reducing practices, specifically manure management systems and feed additives in the U.S. dairy industry. By exploring new financial models, the report highlights how collaboration between financial institutions and the dairy industry can drive sustainable practice adoption, support farmers' sustainability journeys and achieve the dairy industry's 2050 greenhouse gas neutrality goal. It also demonstrates the importance of starting with the farmers' perspective on the financial barriers that must be overcome. Innovative financial models are only valuable when they meet the needs of our farmers.

To move this initiative forward, each potential collaborator has a critical role to play:

- **Dairy farmers and dairy cooperatives** can proactively engage with their current lenders to communicate their financial needs and barriers related to adopting new manure management practices and feed additives. These discussions are crucial to building a better understanding and potential solutions. Dairy cooperatives can also engage with their farmer members to explore how the cooperative can enhance support for implementing climate-smart ag practices. The longstanding partnerships between farmers and dairy cooperatives and the trust they've developed is an opportunity to collectively advocate for more support, significantly amplifying the impact and feasibility of methane reduction efforts within the dairy industry.
- **Financial institutions** can engage directly with dairy clients and inform themselves about initiatives from dairy organizations and the value chain and where they can play a role. This will enable them to stay current on the needs of their customers and consider where sustainable practices and technologies may require new financial models such as those detailed in this report. Financial institutions should also integrate such opportunities into an overall sustainability strategy and approach to collaboration in the agricultural sector.
- **Dairy value chain companies** can drive the adoption of climate-smart ag practices in their supply chain by identifying financing gaps that need support, providing incentives directly to farmers and directly collaborating with financial institutions. They should also consider whether they can contribute catalytic capital to help realize one or more of the financial models in this report. By collaborating with financial institutions, dairy value chain partners can participate in financing opportunities that not only align with their sustainability objectives but also contribute to systemic change as financial models are proven to be viable.
- **Impact investors and philanthropies** can contribute catalytic capital to help these nascent models come to fruition. In the current moment when multiple collaborative efforts are blossoming across the dairy and financial sectors, it is likely that gaps will need to be filled for deals to reach the finish line. These catalytic capital opportunities will bring immense leverage in terms of private capital participation and learning about which models will drive the greatest impact.

Getting Involved

Given the urgent need to scale funding for methane mitigation practices and technologies, there are numerous opportunities for dairy value chain members, financial institutions and other partners to advance new financing models together. EDF and the Innovation Center for U.S. Dairy invite all those interested to collaborate to realize these financial solutions for the benefit of dairy farmers and the climate. We encourage interested parties to reach out and we look forward to piloting these models in the coming months.



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