



**NYSERDA**

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# CLIMATE FINANCE TOOLKIT:

## A RESOURCE FOR LENDERS

DECEMBER 2021

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*This toolkit was developed by NYSERDA in collaboration with the [New York Credit Union Association \(NYCUA\)](#) and [Inclusiv Center for Resiliency and Clean Energy \(Inclusiv\)](#). NYSERDA extends their appreciation to NYCUA and Inclusiv for their contribution.*

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## **Financing for clean energy markets plays a significant role in achieving New York State’s climate goals and represents a significant opportunity for banks and credit unions and other financial institutions.**

As such, the New York State Energy Research and Development Authority (NYSERDA) has developed the Climate Finance Toolkit to assist lenders and other stakeholders through the processes of developing clean energy sector strategies and clean energy loan products. The toolkit also provides general information on relevant clean energy market trends and technologies.

Lending for clean energy projects encompasses both energy efficiency upgrades and renewable energy installations, as both can reduce use of nonrenewable energy and minimize environmental pollution and greenhouse gas emissions.

Lenders interested in offering loan products aimed at the clean energy sector can use this document to obtain a basic understanding of:

- The current market opportunity for clean energy loan products
- Projected growth and performance in clean energy technologies and loans
- Loan products and payment structures that are most common in clean energy lending
- Potential market risks and other climate-related financial risk factors
- Financial support and resources available through State and federal programs

**FOR MORE INFORMATION OR TO ANSWER ANY QUESTIONS, PLEASE CONTACT NYSERDA'S PROGRAM ADMINISTRATORS, JOHN JOSHI OR HEATHER CLARK, AT [NYSLLR@NYSERDA.NY.GOV](mailto:NYSLLR@NYSERDA.NY.GOV)**



# BACKGROUND: CLIMATE CHANGE IS CHANGING EVERYTHING

**It has been well documented that climate change not only poses imminent threats to wildlife, the natural environment, and our health, but also to the economy and financial markets.** Climate risks are an aggravator of all the other families of risk, and have shown the potential to affect financial stability. Specifically, the impacts of climate change pose credit, market, liquidity, reputational, and operational risks to lenders and their portfolios. This document provides banks, credit unions, and other lenders with guidance on how to navigate those risks and remain resilient in the face of climate change.

**The urgency for climate action cannot be overstated.** Even as steps are currently being taken to reduce emissions, greater investments are urgently needed to ensure that households, communities, businesses, and municipalities are prepared for the transition to clean energy. The market is quickly moving towards clean energy investments as a standard offering, and the financial institutions who can position themselves in the market early can establish themselves as leaders and innovators. In this way, lenders have a unique opportunity to provide the financial momentum for the transition to clean energy while strengthening the resilience of the communities they serve.



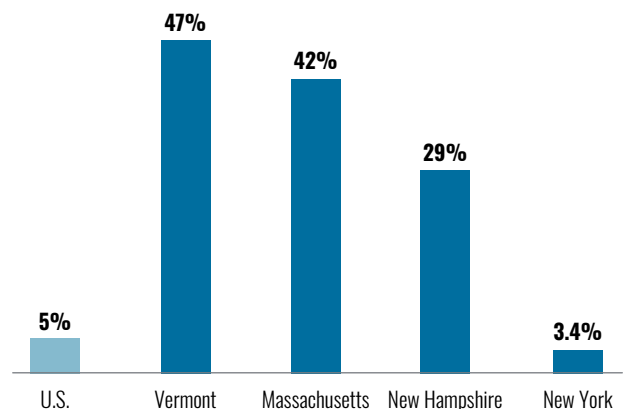
# MARKET INSIGHTS: CURRENT TRENDS AND FUTURE PROJECTIONS

**The clean energy market is growing rapidly and becoming more affordable.** As such, demand for clean energy loan products is also expected to continuously grow. Clean energy lending presents a huge market opportunity for both small and large lenders to expand their portfolios and clientele, and financial institutions that develop clean energy lending programs will have a competitive advantage as the market expands.

## KEY TRENDS AND TAKEAWAYS:

- In 2020, the solar industry generated more than \$25 billion of private investment in the American economy!
- Banks, credit unions, and other lenders can reach new customers and offer beneficial opportunities to existing customers by offering clean energy loan products.
- Lenders can support the communities they serve by helping New York residents and businesses achieve their clean energy goals.
- New fossil fuel investments are expected to become more expensive and less common in the near future, making traditional investments riskier.
- It is becoming increasingly common for interest rates to be tied to climate risk levels.
- Larger lenders are well positioned to provide financing to large-scale green infrastructure projects that are on the horizon.
- Financial institutions play a vital role in transitioning our economy away from fossil fuels.
- The Northeast regional market leads the country in credit union green lending programs, yet New York is lagging. **Less than 4% of New York State credit unions offer green loan products,** meaning there is still an opportunity to capture early market share.
- Even prior to the Coronavirus pandemic, one in four houses struggled with high energy costs, indicating that clean energy investments solve a real pain point for consumers.
  - ▶ Low-income households, older adults, and people of color have experienced the heaviest burden.
- Clean energy can be a powerful tool to drive economic revitalization by building good jobs, while increasing energy affordability and reliability. By working closely with the communities they serve, lenders can expect to see a ripple effect of benefits from their clean energy lending programs.

CREDIT UNIONS LENDING FOR  
CLEAN ENERGY & ENERGY EFFICIENCY



Credit: Inclusiv Center for Resiliency and Clean Energy

## IT WILL BE CRITICAL FOR LENDERS TO STAY UP TO DATE WITH BOTH STATE AND LOCAL ORDINANCES REGARDING CLEAN ENERGY AND BUILDING DECARBONIZATION PROJECTS



# GLOBAL MACRO TRENDS IN GREEN INVESTMENT

### GLOBAL INVESTMENT IN:

#### ENERGY TRANSITION

\$501.3 BILLION IN 2020

9% INCREASE SINCE 2019

#### RENEWABLES

\$303.5 BILLION IN 2020

2% INCREASE SINCE 2019

#### SOLAR

\$148.6 BILLION IN 2020

12% INCREASE SINCE 2019

LARGEST INVESTMENT IN RENEWABLES SECTOR

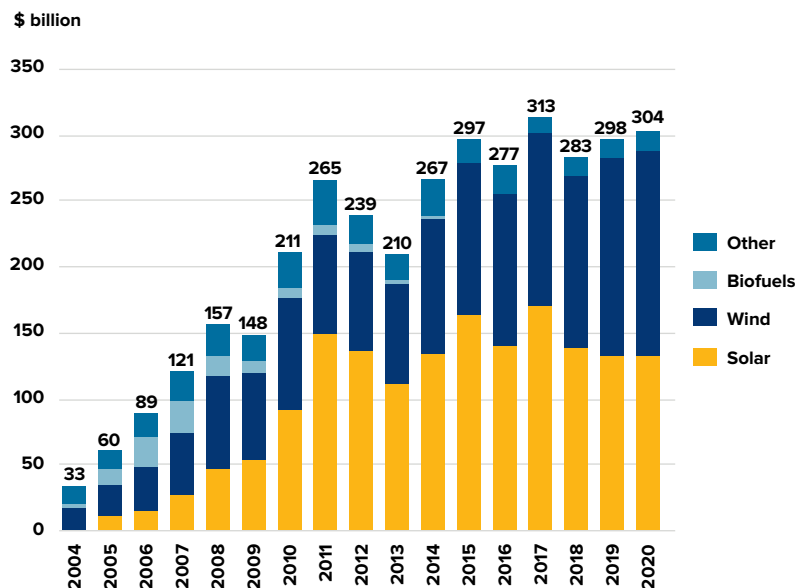
LARGEST GROWTH IN RENEWABLES SECTOR

## STATE AND LOCAL LAWS

New York leads the nation when it comes to bold action and supporting advanced energy solutions to protect the environment.

- The State has set its boldest goals under the Clean Energy Standard, which aims for New York to receive 70% of its energy from renewable sources by 2030.
- More than \$7 billion is being invested in building decarbonization to support clean energy goals under the Clean Energy Standard.
- Many of New York's bold climate goals require new mandates on building codes and incentives for developers who construct green projects.
- Under [Local Law 97](#) in New York City, commercial buildings must reduce their energy use by 2030, or risk paying fines. More than 57,000 buildings will need to reduce their building-based emissions by 40% based on 2005 levels.
- Across New York City and around the State, buildings will be refurbished and constructed to meet low-carbon emission standards. This process will require significant capital investments, and developers need to be mindful of the impact and effectiveness of building's energy efficiency improvements.

Global new investment in renewable energy by sector



Source: BloombergNEF



## SOLAR

With the market for solar installations projected to grow exponentially, banks and credit unions should consider offering solar loan products as a new revenue stream. Falling prices are fueling demand in the solar market. For example, an average-sized residential system has dropped from a pre-incentive price of \$40,000 in 2010 to roughly \$20,000 today.

### KEY SOLAR TAKEAWAYS FOR LENDING LEADERS

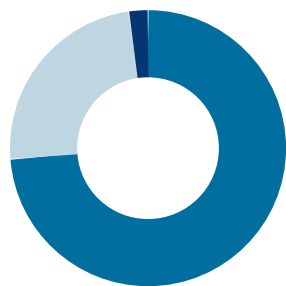
- The market for residential solar is expected to double by 2023.
  - NYSERDA predicts the residential demand for energy efficiency and solar loans in New York will be 20% higher in 2022 than 2019.
- With solar and related technologies in mind, forward-thinking financial institutions are already expanding clean energy markets in their areas.
- Incorporating solar into a lending portfolio reduces risk.
  - Savings from clean energy investments improve client cash flows.
  - Traditional assets may become riskier as clean energy regulations tighten.
- Investing in solar delivers on your institutions Corporate Social Responsibility goals.
- Regulators are increasingly assessing climate risks – investing in clean energy technology plays a major role in mitigating those risks.
- Clean energy investments in low- to moderate-income communities<sup>2</sup> qualify for Community Reinvestment Acts credits under updated banking regulations.
- Related technologies, such as battery storage for solar energy, are also expected to grow in demand.
  - Battery storage technology is still relatively nascent, yet the growth over the next five years is expected to be significant. By 2025, nearly 25% of all on-site solar systems will be paired with battery storage, compared to under 6% in 2020.<sup>3</sup>
- Commercial-scale solar installations represent a substantial market opportunity.
  - Currently, less than 1% of U.S. commercial electricity demand is served by on-site solar.
  - With commercial electricity sales continuing to grow, there is significant opportunity to invest in solar for businesses, non-profits, and local governments.
- Investment tax credits on solar equipment are set to phasedown over the next three years, meaning a flurry of installations are expected in the short term (see [Financial Support and Resources](#) for more details).

# NYSERDA IS PAVING THE WAY

**Two key NYSERDA programs are using financial tools to further expand broad access to the market for clean energy solutions.**

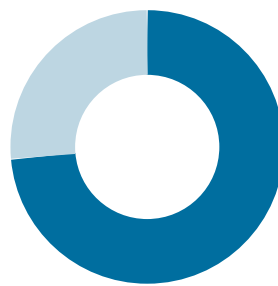
> GREEN JOBS – GREEN NEW YORK

> LOAN LOSS RESERVE



**LOAN PURPOSE**

ENERGY EFFICIENCY  
SOLAR  
OTHER



**LOAN TYPE**

SMART ENERGY  
ON-BILL RECOVERY

# GREEN JOBS – GREEN NEW YORK

**The Green Job – Green New York renewable and energy efficiency lending program, established in 2010, has a rich history of data available to lenders to understand this lending market. NYSERDA provides a portal that lenders can access to understand borrower performance and segment the data by various attributes.** For more information on the Green Jobs – Green New York Residential Loan Portfolio, visit the [Data and Trends](#) information on NYSERDA's website. Please note: State chartered Credit Unions outside of New York can also purchase participation loans from the program to supplement their asset purchases. Currently, New York Credit Unions (state or federal charter) are unable to purchase the program's participation loans. NYSERDA is exploring regulatory waivers that could allow NY CU to also purchase the loans.

NYSERDA can help introduce lenders to local contractors and also work with lenders on marketing channels to target customers in their lending base with webinars and other engagements.

- Since its inception, almost 34,000 residential loans have been originated to address home clean energy needs.
- Over the past five years, 19,500 residential loans were originated through Green Jobs – Green New York, with an average loan amount of \$12,200, at 3.83% APR, to an average credit score of 738<sup>4</sup>.
- These loans saw an average of 6% delinquency, and annualized charge-off .56% of the total value of the portfolio, a metric that is trending downward.
- About 20% of the loans originated by Green Jobs – Green New York since 2016 went to individuals with a FICO score below 680. Lower credit scores are associated with slightly higher rates of delinquency and loss, as well as smaller initial loan amounts.
- Residential performance and access has improved over the course of the program from 2010–2021: average borrower credit scores have dropped, loan amounts have increased, and delinquency rates have decreased.
- Green Jobs – Green New York originates two types of loans: Smart Energy Loans and On-Bill Recovery loans, with the majority being Smart Energy Loans. (The charts below demonstrate this trend along with a breakdown of loan purposes. See [Products and Programs](#) for more details about these specific loan products).

## LOAN LOSS RESERVE

**NYSERDA's Loan Loss Reserve program can mitigate the risk to lenders by ensuring partial or complete loss coverage on defaulted payments at no-cost, allowing lenders to expand their clean energy loan offers to more New Yorkers.**

- Lenders can either pass on the benefits of the loan guarantee in the form of lower interest rates or provide secure loans to borrowers with lower credit.
- Loan Loss Reserve provides partial loss coverage for financing on a wide variety of eligible clean energy projects at no-cost, such as residential, small commercial, nonprofit, and multifamily buildings.
- This additional security enhances the risk profile of clean energy projects and is expected to motivate lenders to offer more clean energy loan products.

**FIND MORE INFORMATION ABOUT LOAN LOSS RESERVE IN THE APPENDIX, AND VISIT [NYSERDA.NY.GOV/LLR](https://www.nysed.gov/LLR)**



# PRODUCTS AND PROGRAMS: DEVELOPMENT AND ADMINISTRATION

Many clean energy loan products may resemble standard personal and business loan products in a bank's portfolio. However, most clean energy projects save consumers money on their energy bills by reducing their energy consumption, meaning the future energy savings help finance the equipment and installation over a longer time horizon. This payback period is a particularly important consideration for larger system installations.

Outlined below are some common methods for financing clean energy projects that are currently on the market. When referencing this list, it is important to note that different scenarios will call for different types of loans. For example, borrowers may either invest into their own properties or enter into a creative lease or ownership model. In other scenarios, such as solar installations and large appliance purchases, the physical asset is often used to collateralize the loan. Thus, the type of financing and loan product will vary depending on these factors.

## EXAMPLES OF FINANCING FOR RESIDENTIAL SOLAR PROJECTS

- Home Equity Loans and Home Equity Lines of Credit
- Cash-out Refinancing
- Solar Power Loans (an unsecured loan with UCC1 fixture filing)
- Channel Partner Funding
- E-mortgages for Clean Energy
- Unsecured Personal Loans
- Consumer Loans
- Solar Leases and Solar Power Purchase Agreements
  - Requires no money down for customers, instead there are regular lease payments
  - Company or developer owns and finances solar equipment, and gets to claim the tax incentives
    - Payments through an intermediary

## EXAMPLES OF FINANCING FOR COMMERCIAL SOLAR PROJECTS

- Solar Power Loans (an unsecured loan with UCC1 fixture filing)
- Financing through an energy services company and/or contractor
- Channel partner funding (with wholesale capital lines)
- Solar Leases and Solar Power Purchase Agreements
  - ▶ Requires no money down for customers, instead there are regular lease payments
  - ▶ Company or developer owns and finances solar equipment, and gets to claim the tax incentives
    - Payments through an intermediary
- Energy Savings Agreements
- Commercial Property Assessed Clean Energy (C-PACE) Loans
  - ▶ Building owners borrow money for energy efficiency, and renewable energy and make repayments via an assessment on their property tax bill. Must be in a state or municipality that has passed PACE legislation, this type of financing is not open to private lenders. Visit [nyserda.ny.gov](http://nyserda.ny.gov) to learn more.
- Small Business Loans (this could include a traditional small business loan or a solar company may take out a loan to lease the panels)
- Commercial Real Estate Loans (underwriting for commercial and utility scale solar is similar to traditional commercial real estate loans)

## EXAMPLES OF FINANCING FOR ENERGY EFFICIENCY IMPROVEMENTS

Prior to examining examples of financing for energy efficiency improvements, it may be helpful to demonstrate examples of typical energy efficiency improvement projects:

- Energy efficiency projects typically include weatherization and/or replacing fossil fuel consuming devices with electricity powered counterparts.
- This might include replacing a gas range with an electric induction stovetop or replacing a gas home-heating system with heat pumps.
- Energy efficiency improvements could also include replacing systems and appliances that may already operate on electricity, and installing more efficient appliances, such as an ENERGY STAR® washer and dryer.
- It can also refer to improvements to a building that permit appliances to work more efficiently, such as replacing windows that let cool or hot air through, or installing timers on devices to shut off automatically when not in use.

### COMMON FINANCING PRODUCTS FOR ENERGY EFFICIENCY IMPROVEMENTS INCLUDE:

- Energy Efficient Mortgages
  - ▶ Energy efficient mortgages can be used by borrowers to purchase or refinance a home that is already energy efficient, such as an ENERGY STAR certified home, or to finance energy efficient improvements to an existing home.
  - ▶ An energy efficient mortgage can act as an energy efficiency loan rolled into a mortgage, allowing borrowers to make only a single monthly payment.
  - ▶ The value of the utility cost savings for the borrower is considered to provide better loan terms.
  - ▶ Energy efficient mortgages should be originated in partnership with a professional home energy assessment prior to loan approval.
- Energy Efficiency Loans
  - ▶ Typically, an unsecured loan, similar to personal loans or taking out a line of credit.
  - ▶ This is a good option for those who do not want to collateralize their home, but loan terms will likely be much shorter and interest rates higher.
  - ▶ Similar to solar, financing energy efficiency improvements usually comes in the form of securitized and unsecuritized loans, as well as mortgage options such as a HELOC or EEM. Consumers may apply for State rebates and incentives on some energy efficiency improvements, which lenders can decide if and how to incorporate these cash flows into the terms of their loan product.

## A CLOSER LOOK AT GREEN JOBS – GREEN NEW YORK’S LOAN PRODUCTS

**Smart Energy Loans** make up most Green Jobs – Green New York loan originations. Smart Energy Loans are unsecured loans paid with monthly repayments, either by check or by automatic payment. These loan amounts range from \$1,500–\$25,000 with terms of 5, 10, or 15 years. Smart Energy Loans are most common with energy efficiency upgrades.

**On Bill Recovery Loans** are structured like Smart Energy loans. However, On-Bill Recovery builds the repayments directly into the borrower’s utility bill. With an On-Bill Recovery Loan, monthly loan payments may not exceed the estimated average monthly energy cost savings. On Bill Recovery is most common with solar projects.

The Green Jobs – Green New York program originates significantly more Smart Energy Loans than On-Bill Recovery. While On-Bill Recovery can be more seamless for both borrower and lender once established, On-Bill Recovery requires cooperation with the borrower’s utility provider, and for the loan obligation to be recorded with the County Clerk.

### CONSIDERATIONS FOR YOUR LOAN PRODUCT OFFERS

- Consider only offering longer terms (10 years or longer) to securitized loans which use the equipment as collateral.
- Competitive fixed interest rates are simple to explain and can help attract new members and customers.
- Solar projects can have a construction timeline of 2–5 months, making solar loans well suited for a structure with a multiple disbursement schedule.
  - ▶ Initial disbursement can serve as a deposit to allow installers to begin permit applications and place equipment orders.
  - ▶ Further disbursements can be requested around the point of installation to cover equipment and labor.
  - ▶ Final disbursement can be released when the project is finalized, allowing the customer to assess satisfaction with project.
  - ▶ With this in mind, it is also important to recognize that limiting the number of disbursements may offer a simpler product, which may be more valuable to installers and consumers.
- Offer customers no cost re-amortizations and no prepayment penalties.
  - ▶ Solar systems can be revenue generating assets and are eligible for potential incentives, such as federal tax credit (which is more than 20% of the system cost).
  - ▶ The ability to amortize ensures the customer has the option to apply incentives as principal payments and lower their loan payments to align with system savings (and therefore better guarantee on-time repayment).

### A NOTE ABOUT FINANCING FOR ELECTRIC VEHICLES

Products for financing electric vehicles closely resemble a standard auto-loan.







# STRATEGIC PLANNING: GUIDELINES TO PREPARE YOUR INSTITUTION

When a financial institution determines it is ready to offer clean energy loan products, they must assess their business strategy, internal structure, resources, and processes to ensure they can approach the market with an informed strategic plan. This section offers advice and guidelines for preparing an effective clean energy lending strategy.

- Community banks and credit unions should consider how including clean energy loan products in their portfolio fits into their larger strategic plan. When a financial institution begins to offer loan products for clean energy projects, they should consider the size of the portfolio and capital investments they want to start off with, their current role and positioning in the market, their short- and long-term objectives, and what business model is needed to achieve the institution's Stated goals.
- Depending on the size of the clean energy lending program, a bank should designate a product manager to support the execution of the clean energy plan and strategy.
- Lenders must also consider how they plan to acquire clients for these products, either through existing channels, or most often lenders receive loan applications by forming partnerships with contractors who specialize in clean energy installations.
- Additionally, these strategic plans must consider how clean energy loan products might affect other areas of the bank's business and consider how other investments in their portfolio might fare given local changes in climate and weather. As a bank branches out into lending for climate resiliency projects, it's crucial to consider how other projects in their portfolio, and in their community, might be affected by changes in weather events over the next 15–20 years.
- Establish impact metrics that assess how the lending portfolios align with the goals of the organization regarding economic and community development, as well as the climate goals set in their jurisdiction. How will your portfolio meet current and future regulations, as well as build the financial resilience of borrowers?
- Consider how your financial institution will demonstrate to your regulator that you are able to manage any real or perceived risks related to offering this new loan product, and how taking advantage of NYSERDA's Loan Loss Reserve program will help you to mitigate your risk.

**To summarize, a lenders strategic plan for clean energy loan products should address a broad range of questions.**

- What size and type of loan products will fit into the bank's existing portfolio?
- How are these products similar or different to existing products in their portfolio?
- How much risk are they willing to take on?
- Does the organization have adequate personnel with the skills and knowledge to underwrite these products?
- What metrics will be used to measure success?

**FIND DETAILED INFORMATION ON HOW TO GET STARTED AND HOW LENDERS SHOULD CONSIDER CLIMATE RESILIENCY, IN THE [APPENDIX](#).**

## CONTRACTOR PARTNERSHIPS AND ESTABLISHING A BORROWER PIPELINE

Many homes and businesses who enter clean energy projects will work through a contractor or specialized solar installer. These contractors often help their customers find proper financing for their project. Therefore, banks, credit unions, and lenders can benefit from forming relationships with clean energy contractors and installers, who can refer business and new clients to them for financing. Other partnerships could include community groups and State agencies, like NYSERDA.

As a State agency, NYSERDA is well positioned to help lenders establish a pipeline of borrowers for clean energy loan products:

- NYSERDA hosts periodic webinars for lenders and new lenders coming to the New York market.
- NYSERDA has a list of hundreds of actively engaged contractors and our outreach program provides the opportunity for lenders to showcase their programs. This is a cost-effective way to generate loan leads.
- NYSERDA is actively engaging the market to expand supply and demand for climate finance in New York.
- NYSERDA is working with Inclusiv and NYCUA to develop engagement ideas for training, structural support, lead-gen, risk management and programmatic support to assist lenders in engaging in the market.

**FIND MORE INFORMATION ON HOW TO DEVELOP A PIPELINE OF CONTRACTORS AND OTHER KEY STAKEHOLDERS, IN THE [APPENDIX](#).**

## CONSIDERATIONS FOR CONTRACTOR PARTNERSHIPS

Lenders should consider the following prompts while establishing contractor partnerships:

- Do you want to specify a list of eligible contractors? (You may consider your practice for other construction loans.)
- Do your partner contractors hold the appropriate electrical and building licenses?
- Will contractors be asked to sign a partnership agreement or perhaps be a signatory to one of the loan application documents?
- NYSERDA has seen approaches to contractor partnership eligibility range from more restrictive, such as bringing on a third party to review/approve new installers, to more open approaches, such as allowing any licensed contractor and putting all diligence on the consumer.
  - ▶ Do you want to allow self-installs by licensed electricians?
  - ▶ Will your partnership program require certain additional certifications or standards such as North American Board of Certified Energy Practitioners certification, or Better Business Bureau ratings?
  - ▶ What other simple requirements will you consider to ensure your partners are experienced?
    - For example, some lenders require the contractor to have performed at least ten previous projects.
    - Many lenders will request references from prior customers to ensure positive customer experiences.
    - For example, require contractors you work with to provide their customers with clear, transparent, itemized invoices so there are no hidden fees being passed on to the customers.

Lastly, while you are establishing your clean energy lending program's contractor partnerships, remember that because the energy savings of an energy efficiency upgrade are crucial to the financing, it is important to work with high-quality and reputable contractors to ensure high-quality and efficient installations.



# FINANCIAL SUPPORT AND RESOURCES: OVERVIEW OF FUNDING AND INCENTIVES

Federal, State, and some local jurisdictions offer tax incentives and special programs to subsidize or de-risk lending for clean energy projects. Some federal tax credits are set to step down, and in some cases expire, over the next few years. However, many State authorities, including NYSERDA, offer programs to support financial institutions who choose to lend in this sector. Additionally, there are many financial supports available to consumers, which can be incorporated into a loan product's terms and leveraged to mitigate risk for the lender or offer the customer better terms.

This section provides detailed information on some of most commonly utilized resources and incentives for clean energy lenders.

## COMMUNITY REINVESTMENT ACT CREDITS

As of 2021, clean energy improvements and installations in low- to moderate-income communities now qualify for Community Reinvestment Act credits. With regulators in agreement, there should be less confusion and subjectivity surrounding a clean energy loan's qualification for Community Reinvestment Act credit. The new ruling also States that tax equity investing is a valid form of financing for clean energy projects, thus removing the regulatory uncertainty around this practice. Banks and credit unions can now expand their Community Reinvestment Act qualifying lending activities to include solar projects.

**FIND MORE INFORMATION REGARDING THE EXPANDING QUALIFICATIONS FOR COMMUNITY REINVESTMENT ACT, VISIT [NYSERDA.NY.GOV/CRA-REGULATIONS](https://nyscrda.ny.gov/cra-regulations)**

## TAX EQUITY INVESTING

Financial institutions that provide capital can claim tax credits on clean energy investments to mitigate their tax liability and pass on savings to borrowers. While tax credits help offset the cost of clean energy projects, many low- to moderate-income households and businesses lack the tax liability to claim the entirety of the tax credit. Therefore, lenders are well suited to capitalize a clean energy project and claim the tax credit to offset their federal and State tax liability. Due to the complexity of tax equity transactions and the tax liabilities that investors wish to offset, this method is best used for large development projects<sup>5</sup>. For this reason, it is typically large banks, credit unions, and financial institutions that leverage this method of financing.

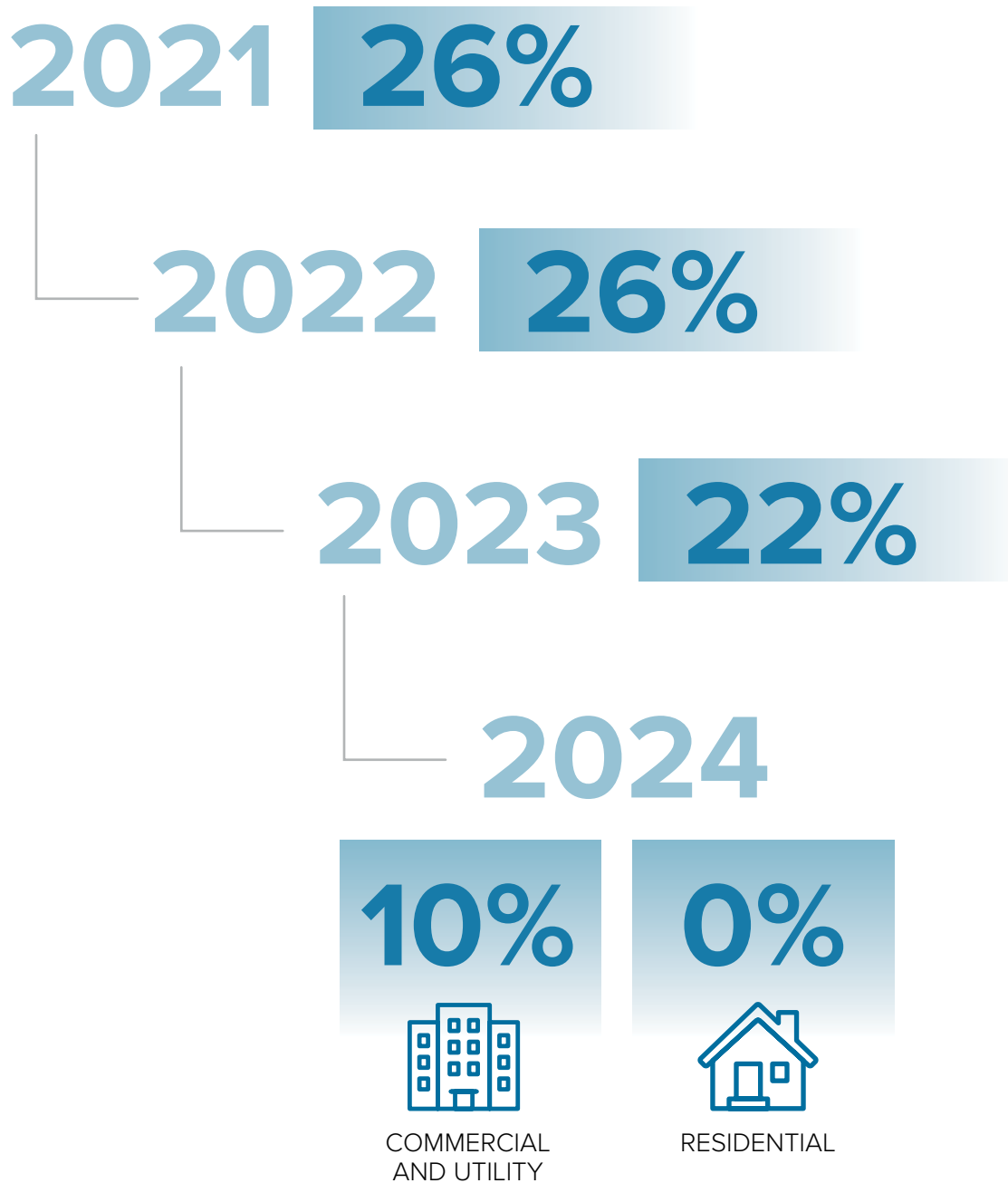
### **PROS OF TAX EQUITY INVESTMENT:**

- Reduces effective tax rate
- Generates more predictable high rates of return on investment
- Utilizes the entirety of the tax credit that would otherwise not be able to be claimed by the borrower

## FEDERAL INVESTMENT TAX CREDIT PHASEDOWN

Currently, 26% of the costs of a new solar system can be credited back to the filer for both residential and commercial projects. This credit will step down to 22% in 2023. In 2024, the residential credit will expire and the commercial credit will step down to 10%. Nonprofits are ineligible to claim investment tax credits on their solar installations.

**Because of this phasedown schedule, lenders should expect record levels of residential and commercial solar installations in the next three years.**



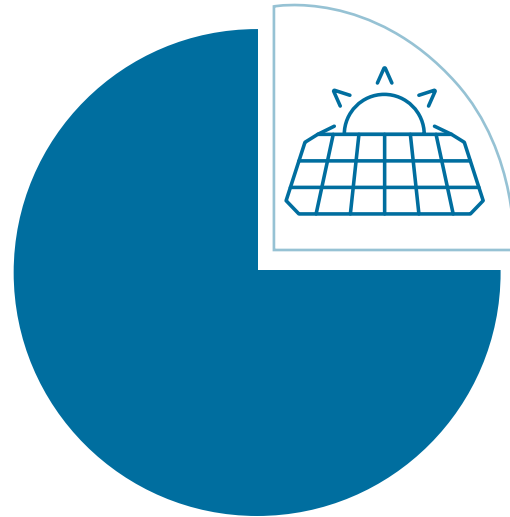
Based on the year construction begins.

## NEW YORK STATE SOLAR EQUIPMENT TAX CREDIT

Using Form IT-255 under the NYS Solar Equipment Tax Credit, 25% of the total cost of a new residential solar energy system can be credited to your State tax payments, up to a maximum of \$5,000. This also applies to leases and purchase plan agreements. The solar equipment tax credit only applies to primary residences, including condominiums and cooperative housing.

### Eligible expenses include:

- Solar panels, inverters, and sales/use taxes on equipment
- Installation costs and indirect costs
- Step-up transformers, circuit breakers, and surge arrestors
- Energy storage devices (if charged by a renewable energy system more than 75% of the time)



FIND MORE INFORMATION BY READING THE U.S. DEPARTMENT OF ENERGY'S GUIDE TO THE FEDERAL INVESTMENT TAX CREDIT FOR COMMERCIAL SOLAR PHOTOVOLTAICS, AT [NYSERDA.NY.GOV/DOE-CSTC](https://www.nyserda.ny.gov/DOE-CSTC) AND VISIT [ENERGY.GOV](https://www.energy.gov)

## LOAN LOSS RESERVE

As previously described in the [Market Insights](#) section, NYSERDA's Loan Loss Reserve program is available to lenders to mitigate clean energy loan risks to lenders by ensuring partial or complete loss coverage on defaulted payments. Please contact NYSERDA for information on how to get involved with Loan Loss Reserve.

In addition to the resources listed above, utility companies may also offer various financing opportunities and should be consulted or partnered with accordingly.





# RISKS: ASSESSMENT AND MITIGATION

Every financial investment contains some inherent risks and it is the underwriter's responsibility to price the loan accordingly. As the impacts of climate change play out worldwide, physical risks and transition risks are the two primary transmission channels through which climate change could impair financial institutions and markets. For this reason, financial institutions, especially those that operate within small communities, must be aware of how climate change and weather events may affect their community, and the assets therein. Additionally, as markets and energy grids transition to renewable sources, financial institutions must stay aware of how these current and future transitions will affect their portfolio and should consider potential future risks involving market and regulatory shifts and changing climate. Specifically, banks and credit unions that hold on too tightly to assets that will soon be highly regulated or impacted by increasing weather events are putting themselves at additional risk.

While it is anticipated that clean energy investments will prove to be less risky than traditional energy investments moving into the near future, there are still financial risks at play in all loans and investments. For the clean energy sector, this includes performance risk (the risk that a project will not perform as expected).

Residential and consumer projects don't have a direct technology risk to the lender. The loans are made based on consumer credit, just like other secured and unsecured consumer lending your institution may already be doing — from home improvement loans, auto loans, and revolving credit lending. Commercial project financing may have technology or performance risk, based on loan structuring. The following summarizes some risk issues for your consideration:

- Under-performance of projects may put repayment at risk, patterns of under-performance may carry reputational risk.
- Financial institutions counting the full improved cash flow in credit risk assessment are implicitly taking performance risk and energy price risk.
- Re-financing markets, including securitization, and loan participation markets will require assurance that underlying projects are performing and have meaningful environmental impact.
- Strong performance risk understanding encourages innovation and higher returns.
- Underwriters for smaller, local lenders must understand the risks inherent to their communities, including the financial resiliency of citizens, economic impact of investments or changing markets, and local infrastructure at risk due to climate change.

## MANAGING RISKS

The following list provides key tips for managing risks throughout your clean energy portfolio.

- Ensure all source of value in an energy efficiency project is identified and captured.
- Identify the specific risk of energy efficiency investments.
- Identify and tag projects that include an element of clean energy to facilitate assessment of risks in future.
- For smaller projects, portfolio risk appraisal techniques should be used.
- For larger projects, implement risk analysis techniques that identify input factors that have greatest impact on investment performance. Consider using frameworks such as the [Task Force on Climate-Related Financial Disclosures](#) to assess climate related risks.
- Use risk mitigation strategies such as:
  - Performance guarantees
  - Recognized standards by Investor Confidence Project (ICP) and International Performance Measurement and Verification Protocol (MVP)
- [NYSERDA's Loan Loss Reserve](#) can be leveraged by banks and credit unions to mitigate risks by providing loss coverage for clean energy loans.

# APPENDIX 1: ADDITIONAL TOOLS AND RESOURCES

## COMMON FORMS OF RENEWABLE ENERGY

The following list provides a snapshot of the most common forms of renewable energy that may require financing from your institution:

**Solar Energy:** Sunlight can be used to heat water or buildings and can be converted into electrical energy via photovoltaic panels.

- Solar systems can involve various components (see list below), depending on the type of system. Some of the components listed must be installed separately from the primary system and can be bundled together when financing a project.
  - ▶ Solar panels
  - ▶ Inverters
  - ▶ Monitoring systems
  - ▶ Utility grid connections
  - ▶ Energy storage: batteries and charge controllers

**Wind Power:** Conversion of wind energy into electricity or mechanical energy via technologies such as wind turbines, windmills, or wind pumps.

**Hydropower:** Transformation of the force of moving water into mechanical energy and then into electrical power.

**Biomass:** Biological material from agricultural and forestry activities that can be converted into useful forms of energy.

**Biogas:** Combustible gas produced by a process called anaerobic digestion, wherein bacteria break down liquid organic matter in the absence of oxygen.

## COMMON ENERGY EFFICIENCY IMPROVEMENTS

The following list provides a snapshot of the most common types of energy efficiency projects that may require financing from your institution:

**Heat pumps:** General upgrades to heating and cooling systems that are more efficient, and use less energy.

**Water heaters:** Water heaters are the second highest source of energy usage in most buildings. Upgrading to efficient models may reduce reliance on gas through improved efficiency or may be powered entirely by renewable energy sources.

**Weatherization:** Includes a suite of minor structural upgrades to support buildings in retaining heat in the winter and cool air in the summer, without the use of electricity.

**Electric Vehicles (EV):** Automakers are releasing more hybrid and fully electric vehicles that reduce or end reliance on traditional gasoline, in favor of electricity.

## RESOURCES TO HELP YOU STAY PREPARED:

### **CLEAN ENERGY LENDING CHECKLIST**

- Research Grid and Solar Market basics for your State.
  - ▶ [How much solar is being installed in your State?](#)
  - ▶ Understand electric grid prices in your area for the various utility companies (\$/kWh)
    - Compare grid electricity prices to the cost of solar – the more expensive grid electricity is, the easier it is for solar economics to work.
- Understand State Policy environment.
  - ▶ Does your state have net metering?
  - ▶ Does your state have straightforward interconnection rules?
  - ▶ Does your utility have requirements to purchase renewable energy?
  - ▶ Does your state offer additional tax credits and subsidies?
- Connect with solar developers, installers, and contractors.
- Learn from who else is participating in solar lending in your market.
- Choose loan product offerings that best fit your market and clientele.
- Assign senior management responsibility to drive product development and underwriting.
- Consider applying for additional assistance with NYSERDA's Loan Loss Reserve program.
- Still unclear? Sign up for a [Solar Finance Training with Inclusiv](#).

### **STARTING A CLIMATE LENDING PROGRAM**

- Assess the market potential for energy efficiency in key client sectors.
- Understand current and future energy legislation and regulatory environment.
- Identify support mechanisms.
  - ▶ Government grants or financial guarantees
- Assign senior management responsibility to drive product development.
- Product design needs should address the drivers of demand and the provision of capital.
- Encourage and assist developers of building refurbishments and new construction to identify and invest in cost-effective energy efficiency improvements.
- Invest in products using best practice technical processes which abide by internationally recognized standards.
- Assess potential for improving energy efficiency within current property portfolio.

## TRAINING AND SUPPORT

NYSERDA's experts are only a call or an email away to support your institution throughout the process of development a clean energy lending program.

The University of New Hampshire and Inclusiv offer a Solar Lending Professional Training and Certificate - Virtual program. This course is designed for individuals with more than one year of lending experience who work at community-based lending institutions (credit unions, CDFIs, and community banks) and offers two learning tracks:

### CONSUMER SOLAR LENDING MODULES

1. Intro to Solar Finance
2. Consumer Solar Basics
3. Solar Contractors and Providers
4. Solar Market Analysis
5. Solar Loan Product Design
6. Solar Lending Program Implementation
7. Lending Deeper In Your Community

### COMMERCIAL SOLAR LENDING

1. Assessing Market Opportunities
2. Regulatory Context for the Solar Business
3. Solar Development: The Players and Process
4. The Solar Capital Stack
5. Underwriting a Solar Deal: The Project Model
6. Case Study #1 Commercial and Industrial
7. Case Study #2 Multi-Family
8. Case Study #3 Community Solar

**APPLY FOR THESE TRAINING COURSES AT**  
[HTTPS://CARSEY.UNH.EDU/CENTER-FOR-IMPACT-FINANCE/SOLAR-LENDING-TRAINING-SERIES](https://carsey.unh.edu/center-for-impact-finance/solar-lending-training-series)

**THIS PROGRAM CAN ALSO BE ACCESSED THROUGH [INCLUSIV](#)**

# APPENDIX 2: SOLAR LENDING EXAMPLE USING LOAN LOSS RESERVES<sup>1</sup>

A loan loss reserve facility can provide partial risk coverage for your energy efficiency or renewable energy lending portfolio. This additional security enhancement works to de-risk your product offering for energy efficiency or renewable energy loans. This risk sharing from the reserve fund can help your firm broaden the access to capital, increasing loan terms, and potentially lowering interest rates for your members.

In the event of a borrower default, NYSERDA will reimburse lenders up to 90% of the remaining balance of the loan and coupon due to maturity, from the reserve fund, subject to available loan loss reserves accrued for your portfolio. New York State is working to expand equitable access to clean energy technologies. One way is to provide a higher reserve allocation for loans inside designated [disadvantaged communities](#) (DAC).

The loan loss reserve funds take a portfolio approach for risk mitigation and risk sharing. The loan loss reserve coverage is structured at a multiple of the expected anticipated default rate on all the loans in the portfolio to protect your loan portfolio from potential losses.

## **The Loan Loss Reserve program could be expected to have the following impacts for your portfolio:**

- **Increase size of unsecured lending.** Larger loans to finance more deeper upgrades.
- **De-risk your climate finance unsecured lending.** Larger loans to finance more deeper upgrades.
- **Extend loan term.** Loan term could extend for all class of borrowers from 5+ years to 15–25 years, allowing for the monthly payment to closely match the energy savings.
- **Expand underwriting criteria.** Lender can consider expanded underwriting criteria (e.g., lower consumer credit scores or no minimum).

<sup>1</sup> See [Loan Loss Reserve program](#)

<sup>2</sup> Tax Credit (26% until 2022, 22% for 2023, 0% thereafter)

## PORTFOLIO CONSTRUCTION AND CONCENTRATION EXAMPLE

### RESIDENTIAL – LARGE SOLAR PROJECT (12.5KW)

Average Solar Project Cost	\$40,000
<a href="#">NY Rebates</a> (12.5%)	-\$5,000 (payable to borrower at system start)
Federal ITC credit <sup>2</sup>	-\$10,400
<b>Total Loan Amount Financed</b>	<b>\$40,000</b>

**Please note:** The loan can be split up as \$30,000 loan for 20 years and approximately \$10,000 for a short-term 2-year balloon loan.

For the example above, NYSEDA would earmark the reserve amount accrued to your reserve balance account based on the loan type as detailed in the table below:

PON Program goals and amount of reserves accrued for each type of loan / borrower — in this example for a \$40k loan size.

Loan Recipients	Reserve Percentage	Reserves Accrued
Inside <a href="#">Disadvantaged Communities</a> ( <i>&lt; 660 FICO or &lt; 80% Area Median Income</i> )	35%	\$14,000
Outside <a href="#">Disadvantaged Communities</a> ( <i>FICO &gt; 660 and AMI &gt; 80%</i> )	10%	\$4,000

Below is a subset of Loan Loss Reserve terms, however for a complete list review the [Program Opportunity Notice](#).

- Applicants may offer loans with dealer-point buydown, provided it results in a lower net present value (NPV) cost to the borrower based on the term of the loan. Such determination will be made at NYSEDA's sole discretion
- Applicants cannot have prepayment penalties on residential offered financing products.
- Interest rates must be fixed rates.
- Maximum residential interest rates shall be the ten-year Treasury plus 750 basis points.
- Financing products can include secured or unsecured loans as well as those listed above in the Introduction. Financing products are not limited to those listed and NYSEDA encourages Applicants to present innovative financing structures.

As a reference, below are loan examples available in the market through NYSEDA and Credit Unions:

Loan Offer	Loan Recipient Inside a DAC	Interest Rate
Green Jobs – Green New York (NYSEDA)	Yes	3.49 % / 3.99%
Green Jobs – Green New York (NYSEDA)	No	6.99% / 7.49%
Credit Union Lender with LLR Reserves	All Borrowers	4.49% – 5.75%

## PORTFOLIO COVERAGE EXAMPLE

For loan recipients inside a disadvantaged community:

LLR Coverage Award	\$ Amount of DAC Loans issued (35% Coverage)
\$500,000	\$1,428,571

# END NOTES

- 1 <https://www.seia.org/solar-industry-research-data>
- 2 Moderate-income individuals have an annualized family income between 50% and 80% of the HUD area median income. Low-income individuals have an annualized family income of less than 50% of the HUD area median income. Median incomes for every county in the United States can be found on HUD's website: <https://www.huduser.gov/portal/datasets/fmr.html>
- 3 <https://www.seia.org/solar-industry-research-data>
- 4 <https://www.nyserda.ny.gov/Researchers-and-Policymakers/Green-Jobs-Green-New-York/Data-and-Trends>
- 5 <https://sgp.fas.org/crs/misc/R45693.pdf>





