Partners for Agricultural Renewable Energy

North Jersey Renewable Energy Development Assistance Program

An informational webinar brought to you by

NORTH JERSEY RC&D Resource Conservation & Development

EnSave

USDA Rural Development U.S. DEPARTMENT OF AGRICULTURE

Today's Agenda

1. Into to the North Renewable Energy Development Assistance Program, *North Jersey RC&D*
2. Considerations for preserved farms in NJ, *SADC*
3. What does a Renewable Energy Assessment provide? *EnSave*
4. Next steps after the assessment, *EnSave*
5. Some Renewable Energy technologies and how they can be implemented in ag and small business settings, *EnSave*

North Jersey Renewable Energy Development Assistance Project

- Funded by a USDA Rural Development
- Grant awarded to North Jersey RC&D
- Project operated in partnership with…
  - USDA Rural Development
  - North Jersey RC&D
  - EnSave, Inc. a USDA certified *Technical Service Provider* or TSP

North Jersey Renewable Energy Development Assistance Program

Partners for Agricultural Renewable Energy

North Jersey Renewable Energy Development Assistance Project

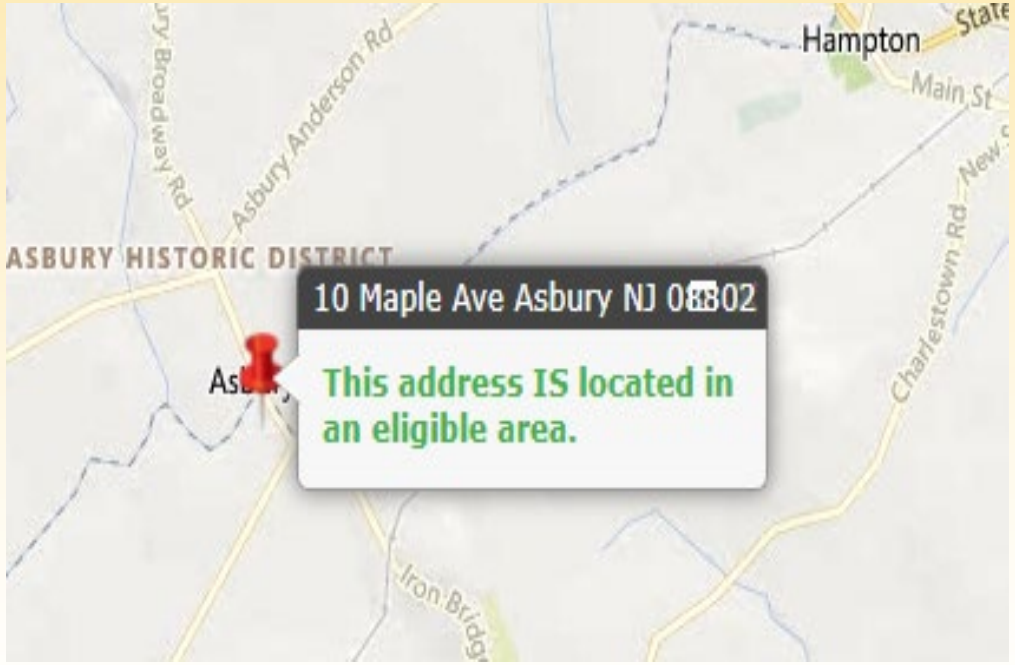
- Educates agricultural producers and rural small businesses about RE technology options
- Delivers *technical assistance* to farmers and businesses who would like to know if renewable energy is a good choice for their operation
- Provides an *application pathway* to USDA RD Rural Energy for America Program or REAP and other funding sources

USDA Rural Development
U.S. DEPARTMENT OF AGRICULTURE

NORTH JERSEY RC&D
Resource Conservation & Development

EnSave

Who Can Join the Program?



The North Jersey REDA program is open to…

- Agricultural producers who derive more than 50% of their income from farm operations
- Rural small businesses located in communities with population below than 50,000
  - Use the *RD Property Eligibility Map* at the USDA Rural Development web site

USDA Rural Development U.S. DEPARTMENT OF AGRICULTURE

NORTH JERSEY RC&D Resource Conservation & Development

EnSave

Who Operates the North Jersey REDA Program?

- NJRC&D administers the program and grant funding
- Outreach to farmers and rural small businesses to build program awareness
- Educates the extended ag community about this program
- RC&D contacts for program information:
  - Laura Tessieri (908) 574-5368; ltessieri@northjerseyrcd.org
  - Frank Pinto (908) 303-2059; frank@frankpinto.net

Who Operates the North Jersey REDA Program?

EnSave

- EnSave fulfills the role of USDA Certified Technical Service Provider
  - independent third-party technical design and evaluation of farm or rural small business sites and potential RE projects

Margaret Lee

Phone: (802) 434-1826

Email: MargaretL@ensave.com

www.ensave.com

USDA Rural Development U.S. DEPARTMENT OF AGRICULTURE

NORTH JERSEY RC&D Resource Conservation & Development

EnSave

RD REAP and Other Funding Sources Require…

Four components to a funding application:

- Application forms
- Supporting documents: deeds, tax returns, BMPs, etc.
- **Renewable Energy System Technical Report**
- Two quotes from RE system vendors/designers/installers

What is a Renewable Energy System Technical Report?

- Required by project funding sources like USDA RD, most other federal programs, some state programs
- Fully documents the RE System's design and installation plan
  - Site plan, including system, access ways, etc.
  - System design, equipment lists and schematics
  - Energy analysis: how much produced, what portion of total operation's energy consumption
  - Economic analysis: costs, offsets, revenue streams

RES Technical Report Contents

For systems between $80k and $200k

NJ REDA Program provides

1. Project Description
2. Resource Assessment
3. Project Economic Analysis

RE/HVAC Vendor provides

4. Project Construction and Equipment Information
5. Qualifications of Key Service Providers - *Both*

What Does the Program Provide To My Potential Customers?

Through the program the farmer or business owner will receive:

- Assistance in selecting a RE project for their site, if needed
- A RE Resource Assessment, also known as a site assessment
  - Quality and quantity of RE resources
  - Proposed system sizing and operational outputs
  - Energy balance analysis at steady-state operation
  - Helioscope or ASHRAE analysis

What Does the Program Provide To My Potential Customers?

- A Project Economic Assessment evaluating the financial feasibility of their RE project
  - Project cost estimates including investment and other production incentives
  - Financial pro forma for the estimated life of the system
  - Calculations of RE system costs and outlays, energy use offsets, and revenue streams
  - Simple payback analysis

What is the Role of a RE or HVAC Vendor?

Participants Need Two Quotes from RE or HVAC System Providers

- Project Construction and Equipment Information
  - Design and specification of the system and its components
  - Discussion of suitability to meet the project's intended purpose re. public safety, compliance with applicable laws and regulations, agreements and permits
  - Commercial availability of proposed project equipment, technology and spare parts
    - "Common Off The Shelf" aka COTS

Preserved Farms: Key Statutory Language

The facilities:

- Cannot interfere significantly with use of land for agricultural or horticultural production
- Must be owned by the landowner or will be owned by the landowner on conclusion of a purchase agreement –no longer than 20-year term
- Must be used to provide power or heat to the farm, either directly or indirectly, or to reduce energy costs on the farm through net metering or similar programs
- Non-permanent mounting systems unless deemed necessary by engineer
- Cannot service an off-farm use or non-agricultural use on exception area
- Are limited in annual energy generation capacity to:
  - **110% of the previous calendar year's energy demand** (not including pre-existing rooftop energy systems) **OR**
  - occupying no more than **1% of the farm's land area**

N.J.A.C. 2:76-24 SOLAR ENERGY ON PRESERVED FARMS

- **Application**
  https://www.nj.gov/agriculture/sadc/applic/

- **Contacts:**

Tim Willmott
Farmland Stewardship Program Manager
Timothy.Willmott@ag.nj.gov
609-984-2504

Charles Roohr
Chief of Agricultural Resources
Charles.Roohr@ag.nj.gov
609-984-2504

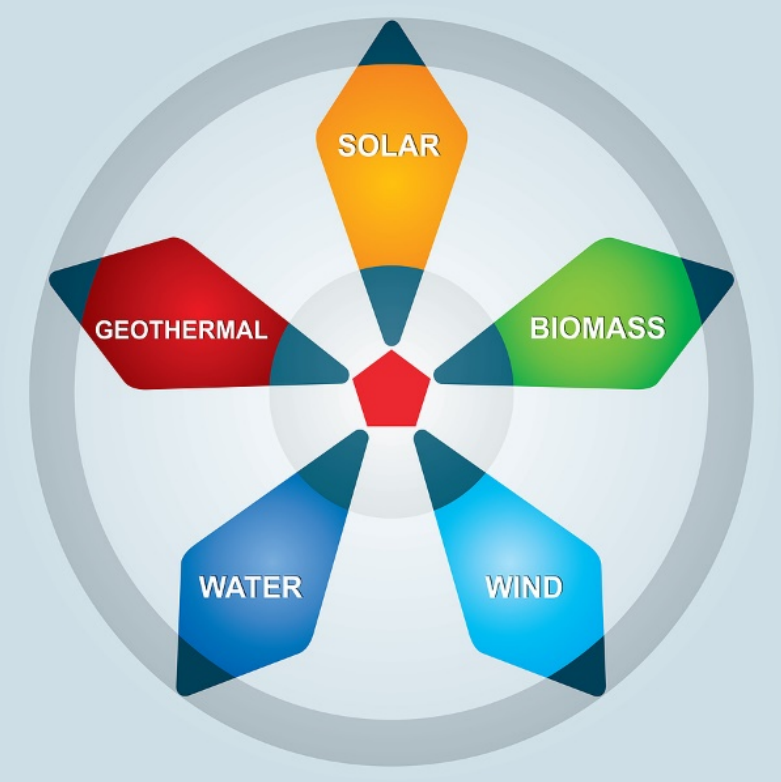


Image licensed under BigstockPhoto.com

Typical Ag/Rural Implementations for Renewable Energy Technologies

USDA Rural Development U.S. DEPARTMENT OF AGRICULTURE

NORTH JERSEY RC&D Resource Conservation & Development

EnSave

Renewable Energy Technologies

Renewable Energy Systems convert energy sources like sunlight, wind and air, and biomass into usable energy like electricity, heat, or methane

The technologies suitable for agriculture and rural small business uses are…

- *Photovoltaics* or PV for electricity
- *Solar thermal* for heated water
- *Micro-scale wind* for electricity
- *Air source heat pump* or ASHP

Rooftop PV Panels

- Most familiar PV system implementation
- Smaller *stand-alone systems* site the PV where needed
- Larger *grid-tied systems* site the PV near the meter
- Mounting on occupancy structures requires special construction techniques

Image 60059 courtesy of NREL Dennis Schroeder

PV Over Pollinator Habitat, Conservation Easements

- Some NRCS state offices allow this on your CAP
- Improved panel performance due to *vegetative microclimate*

Image 52948 courtesy of NREL Dennis Schroeder

PV Over Pollinator Habitat, Conservation Easements

- Traditional racking systems but with panels mounted higher
- Clearing and mowing used on utility “solar farms” is not needed here

Image 53022 courtesy of NREL Dennis Schroeder

PV for Preserved Farms

- Non-foundational PV mounts

Image licensed under BigstockPhoto.com

USDA Rural Development U.S. DEPARTMENT OF AGRICULTURE

NORTH JERSEY RC&D Resource Conservation & Development

EnSave

PV Over Market Row Crops

- Tall mounting systems enable tractor activities
- Studies with tomatoes and peppers show *beneficial shading* reduces water use, increases crop yields

Image 53117 courtesy of NREL Dennis Schroeder

PV Over Market Row Crops

- Good combination with drip irrigated plasticulture systems, extends productive season in tested crops
- Panel racks use **heavier construction, larger foundations** than typical rack mounts

Image 53073 courtesy of NREL Dennis Schroeder

PV Over Farm Ponds

- A space-saving configuration for producers using pond-sourced irrigation or stock watering
- Special MDPE floating rack system
- Keeps water temperatures lower and suppresses algae growth

Image 53977 courtesy of NREL Dennis Schroeder

North Jersey Renewable Energy Development Assistance Program

Partners for Agricultural Renewable Energy

Webinar July 1, 2021

PV Over Farm Ponds

Image 53274 courtesy of NREL Dennis Schroeder

USDA Rural Development U.S. DEPARTMENT OF AGRICULTURE

NORTH JERSEY RC&D Resource Conservation & Development

EnSave

PV Over Parking

- Roof-mounted PV is problematic in several ways
- Taller racks located over parking lots provide shading

Image 26483 courtesy of NREL Dennis Schroeder

PV Over Parking

Image 48749 courtesy of NREL Dennis Schroeder

PV Over Sidewalks

- Awning-style mounting racks avoid roof installation and provide sun and rain protection and add architectural appeal

Image 09723 courtesy of NREL Bryon Stafford

PV Plus Pergola or Privacy Fencing

- Adds architectural appeal with a very small footprint
- Can be combined with trellising or privacy fencing between spans to provide visual screening, control egress

Image 12249 courtesy of NREL Pardee Homes

Image 48507 courtesy of NREL Dennis Schroeder

Solar thermal

- Most common ag and RSB implementations are milking parlors to heat up water for wash-up use

Image 60053 courtesy of NREL Dennis Schroeder

PV Plus Solar Thermal

- A good solution for electrically remote locations

Wind Micro, Mini and Midi-Turbines

- Smaller scale means less costly, smaller tower and foundation
- Micro-turbines for isolated single-motor uses
- Mini-and Midi-turbines may provide adequate electricity for general lighting, smaller loads

Image 28428 courtesy of NREL Dennis Schroeder

Wind Micro, Mini and Midi-Turbines

Image 11237 courtesy of NREL Dennis Schroeder

USDA Rural Development U.S. DEPARTMENT OF AGRICULTURE

NORTH JERSEY RC&D Resource Conservation & Development

EnSave

North Jersey Renewable Energy Development Assistance Program

Partners for Agricultural Renewable Energy

Webinar July 1, 2021

PV Plus Wind for stock watering, other remote loads

USDA Rural Development
U.S. DEPARTMENT OF AGRICULTURE

NORTH JERSEY RC&D
Resource Conservation & Development

EnSave

PV Plus wind for Parking Lot Lighting

- Smaller-scale turbines and panels
- Can be used to directly power special DC lighting so no need for inverters, etc.

Image 39779 courtesy of NREL Unknown

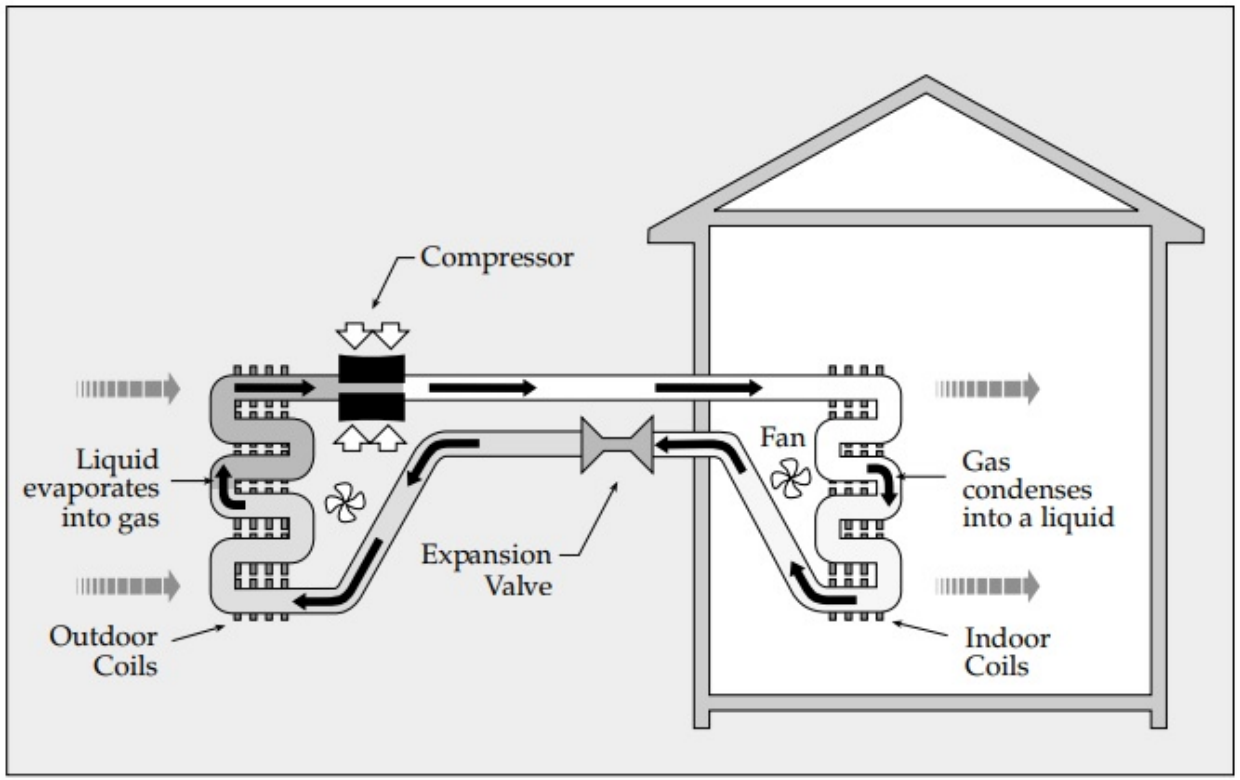


Image courtesy of NREL Publication 28037

What is an Air Source Heat Pump? How does it work?

- Air source heat pumps are fundable through the RD REAP grant program

USDA Rural Development U.S. DEPARTMENT OF AGRICULTURE

NORTH JERSEY RC&D Resource Conservation & Development

EnSave

Image 20210309 Courtesy of NRELTom Marsik

Air Source Heat Pump or ASHP

- An *Energy Efficiency* measure that can be implemented under USDA RD's Rural Energy for America Program
- May qualify for state, IOU and regional grid operator incentives also

Questions?

Join the program today!

- Program Information and sign up available at: www.northjerseyrcd.org/reda
- Questions for EnSAVE: (800) 732-1399 MargaretL@ensave.com