

Introduction to Photovoltaic (PV) Facilities

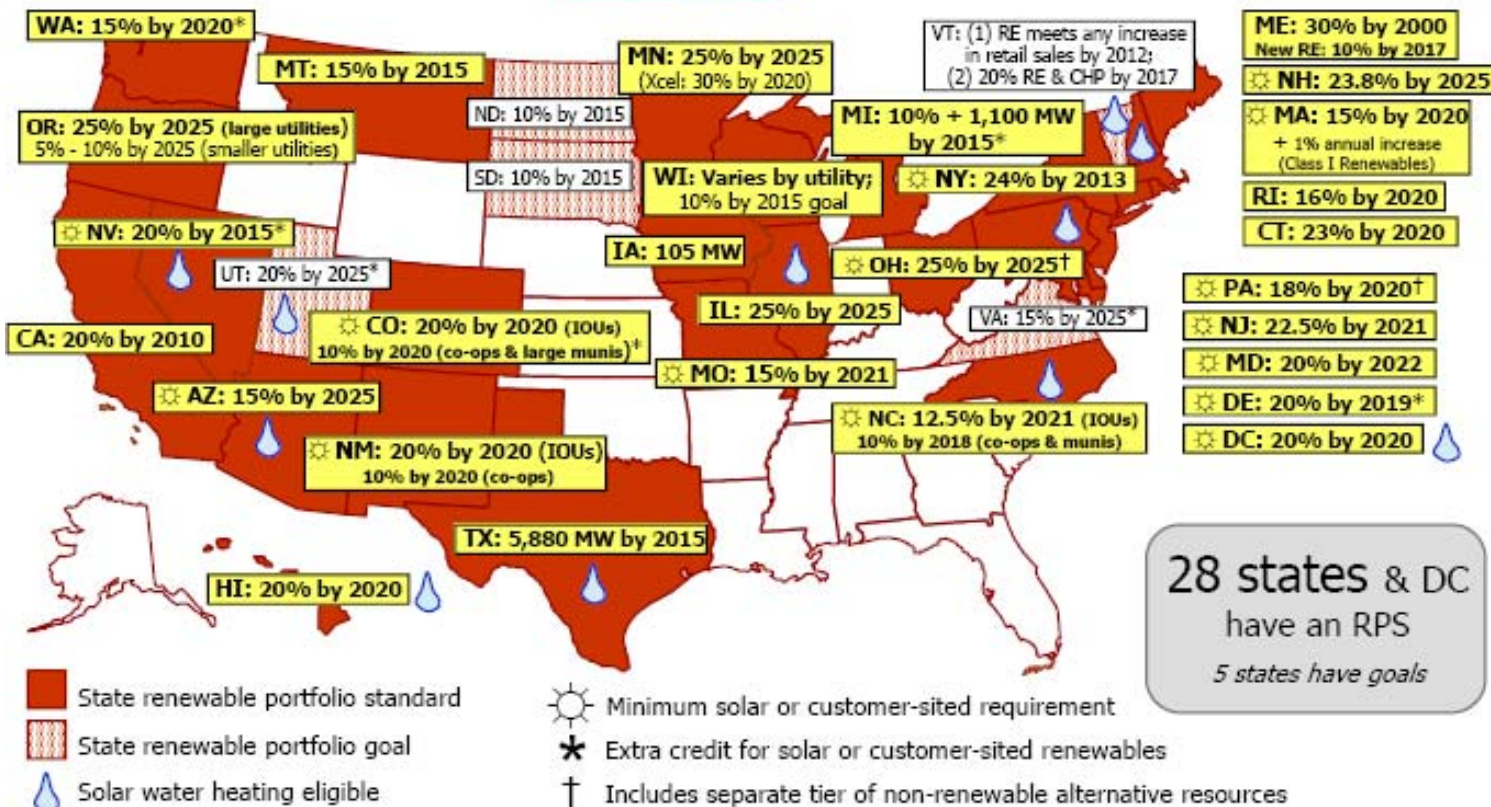


Hunterdon County Planning Board



Renewable Portfolio Standards

www.dsireusa.org / April 2009



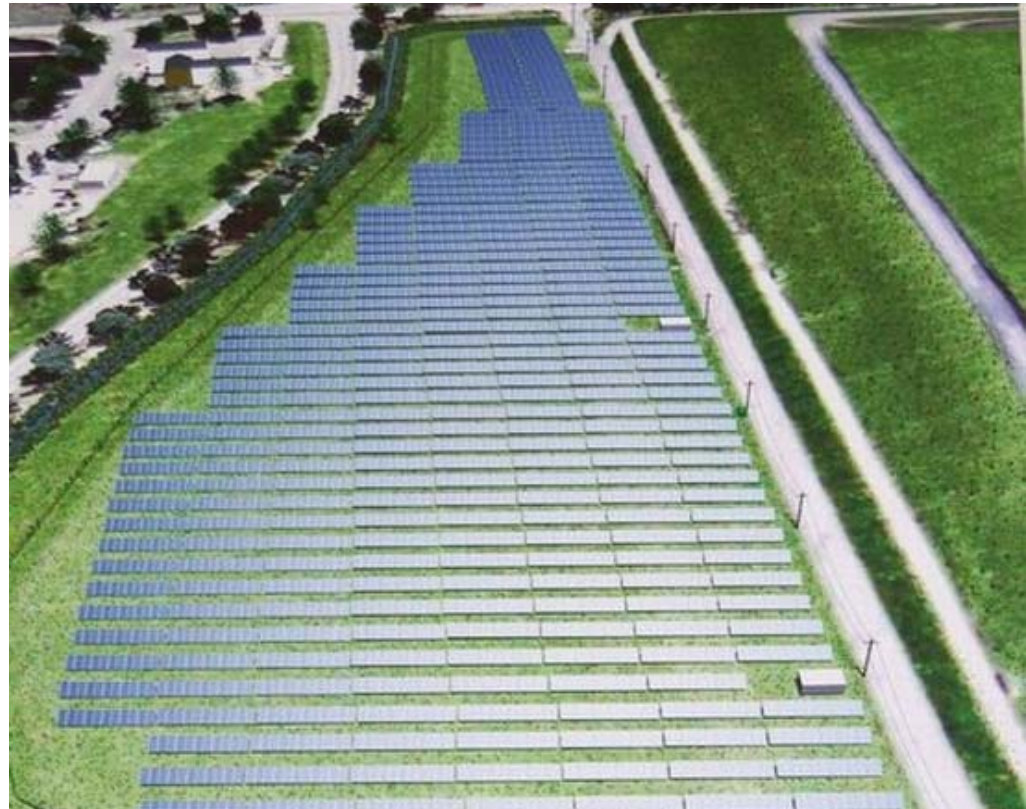
28 states & DC
have an RPS
5 states have goals

TYPES OF SOLAR PANEL DEVELOPMENTS

Fixed Tilt Ground Mount Arrays

Usually:

- Ground based PV facilities
- Typically utilize open fields
- Tilt angle optimized for location
- Minimal earthwork
- Southern Exposure
- Flexible layout
- Low Maintenance



Carport Arrays

- Provides car shading for customers or employees
- Accommodates single or double row parking spaces
- Creates difficulties with snow and ice removal
- Should incorporate lighting underneath the panels
- More expensive than ground mount



Tracking Ground Mount Arrays

- Increased kilowatt-hour production
- Tracks the sun across the sky
- Single or dual axis trackers available
- More expensive than ground mount
- Higher maintenance costs



Flat Roof Arrays

- Simple to install
- Ballast design does not require roof penetrations
- Typically less than 4 lbs/sq ft
- Planning Board approval is typically not required



GROUND MOUNTED SOLAR ARRAY COMPONENTS

Photovoltaic (PV) Components

Foundations:

- Drive-in piles
- Screw in posts
- Poured Concrete Footings
- Pre-cast Concrete Ballasts



Photovoltaic (PV) Components

Arrays:

- Typically range in height from 3' to 15'
- Tilt Angles can vary from 15° to 40°
- Spacing between arrays is determined based on height and tilt angle
- Panel dimensions and output vary per manufacturer



Photovoltaic (PV) Components

Inverters and Transformers:

- Convert DC current to AC current
- Monitor power output
- Remotely monitored
- Vary in size, typical max output is 500 Kw
- Mounted on concrete pads



MUNICIPAL ORDINANCE DISCUSSION TOPICS

Items to Consider while Preparing a Municipal Ordinance

- On November 11, 2009, the definition of “Inherently Beneficial Use” in the MLUL was amended to read: **“a use which is universally considered of value to the community because it fundamentally serves the public good and promotes the general welfare. Such uses includes, but is not limited to, a hospital, school, child care center, group home, or a wind, solar or photovoltaic energy facility or structure.”**

An Inherently Beneficial Use presumptively satisfies the positive criteria for the grant of a variance under 40:55D-70 regardless if the facility is a principal use, a part of a principal use, or an accessory use.

Items to Consider while Preparing a Municipal Ordinance

Define what you want to regulate

- Define small arrays differently than large arrays?
- Define accessory systems differently than principal systems?
- Regulate rooftop installations?
- Allow solar installations as a “Permitted Use” or “Conditional Use” in certain zones of the municipality?

If a Conditional Use, then the following additional items should also be discussed:

Items to Consider while Preparing a Municipal Ordinance

- 1) Setbacks and/or buffers to residential properties, roads, Scenic Byways, and Greenways.
- 2) Geological evaluation of the site to determine depth to bedrock and soil conditions as a checklist item. This information is needed to design the foundation supports and installation methods.
- 3) Will the ground surface to be maintained with a vegetative cover? If so, will it be mowed on a regular basis or controlled to prevent weeds or other invasive species from growing or spreading.

Items to Consider while Preparing a Municipal Ordinance

- 4) How much ground disturbance and topsoil removal will be allowed? Stormwater Management is required on facilities that disturb more than 1 acre of ground or contain more than $\frac{1}{4}$ acre of impervious. Solar panel arrays are not considered to be impervious. In some cases, vegetation should be established prior to the installation of the panels to reduce erosion.

- 5) Consider additional setback and buffer requirements for inverters and electrical substation improvements.

Items to Consider while Preparing a Municipal Ordinance

- 6) Consider that the facilities may produce glare. “Glint and Glare” studies should be provided at adjoining residential properties, roadways, and within airport safety zones as a checklist item.
- 7) Establish security requirements, such as fencing, Knox box installation, name and contact information of the facility operator to be posted on-site. Specify emergency vehicle access requirements.

Finally;

- 8) Define “abandonment” and set criteria for removal and restoration of the land.

Thank You

Contact Information:

C. Richard Roseberry P.E., P.P., A.I.C.P.

53 Frontage Road, Suite 120

P.O. Box 4013

Clinton, NJ 08809

908-238-0900 (phone)

908-238-0901 (fax)

rroseberry@maserconsulting.com