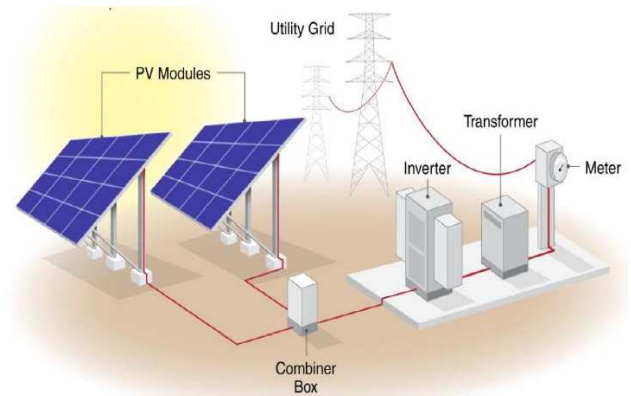


## What is a Utility-Scale Solar Installation?

- Most utility-scale solar operations (> 1 acre) are erected as ground-mounted arrays on open land.
- Ground-mounted systems are made of a metal racking structure which supports solar panels (modules) and is anchored to the ground.
- Modules are wired together in a series to create individual arrays.
- The arrays feed electricity to inverters and transformers on a centrally located electrical pad which ties into the electrical grid.



Source: NREL

## Types of Ground-Mounted Systems

- Arrays may be fixed in tilt and orientation (fixed-mount); or
- Have mechanical parts allowing it to track the sun adjusting its tilt and orientation (trackers).

## Foundation Types and Installation

### Ground Screws/Helical Piles/Driven Piles

- Installed with small machinery (track excavator, mini-excavator, skid steer).
- Less site disturbance, no soil cuttings.
- Load bearing immediately.
- Limited use in gravel and rock.
- Avoids concrete.
- Removable, reusable.



Helical Piles and Ground Screws  
Source: EDRISolar



Ground Screws  
Source: Solar Power World



Ground Screw Installation  
Source: ReVision Energy

### Foundation Types and Installation (Cont'd)

#### Ballasts

- Non-penetrating foundations, racking attached directly to an above grade footing, block or basket.
- Concrete can be precast or cast into basins onsite.
- Rocks maybe used to fill baskets.
- Typically used on landfills.
- Used on relatively flat sites.



Source: City of Portland, Maine

#### Concrete Piers

- Posts suspended in holes 1-1.5' wide at ~6-8' depth.
- Appropriate for steep grades (30-40% slope).
- Used in corrosive soils with high pH.
- Involves more equipment onsite for boring and pouring concrete.
- Considerable soil cuttings.



Tracker solar farm utilizing concrete piers

Source: EnergySage

### Trenching for Electrical Conduit

- Wiring modules together is done above-ground with wires secured beneath modules.
- Each string of modules wired together feeds an inverter attached to the racking system.
- Inverters are connected to a central equipment pad through underground electrical conduits.
- Typical depth of conduit is 30-48" for large scale projects.
- Connections from the equipment pad to the grid are above ground.



Image of a conduit trench with topsoil and subsoil separated on opposite sides. Note the blue inverters attached to the racking structure.

Source: BRE National Solar Centre

**For additional information on Agrivoltaics  
please see our factsheet at: [http://www.maine.gov/  
dacf/ard/resources/docs/dual-use-factsheet.pdf](http://www.maine.gov/dacf/ard/resources/docs/dual-use-factsheet.pdf)**