

WESTERN MASSACHUSETTS SOLAR FORUM



Costs and Complexities of Solar Deployment Across Project Types & Scales

September 12th, 2023

Andy Toomajian

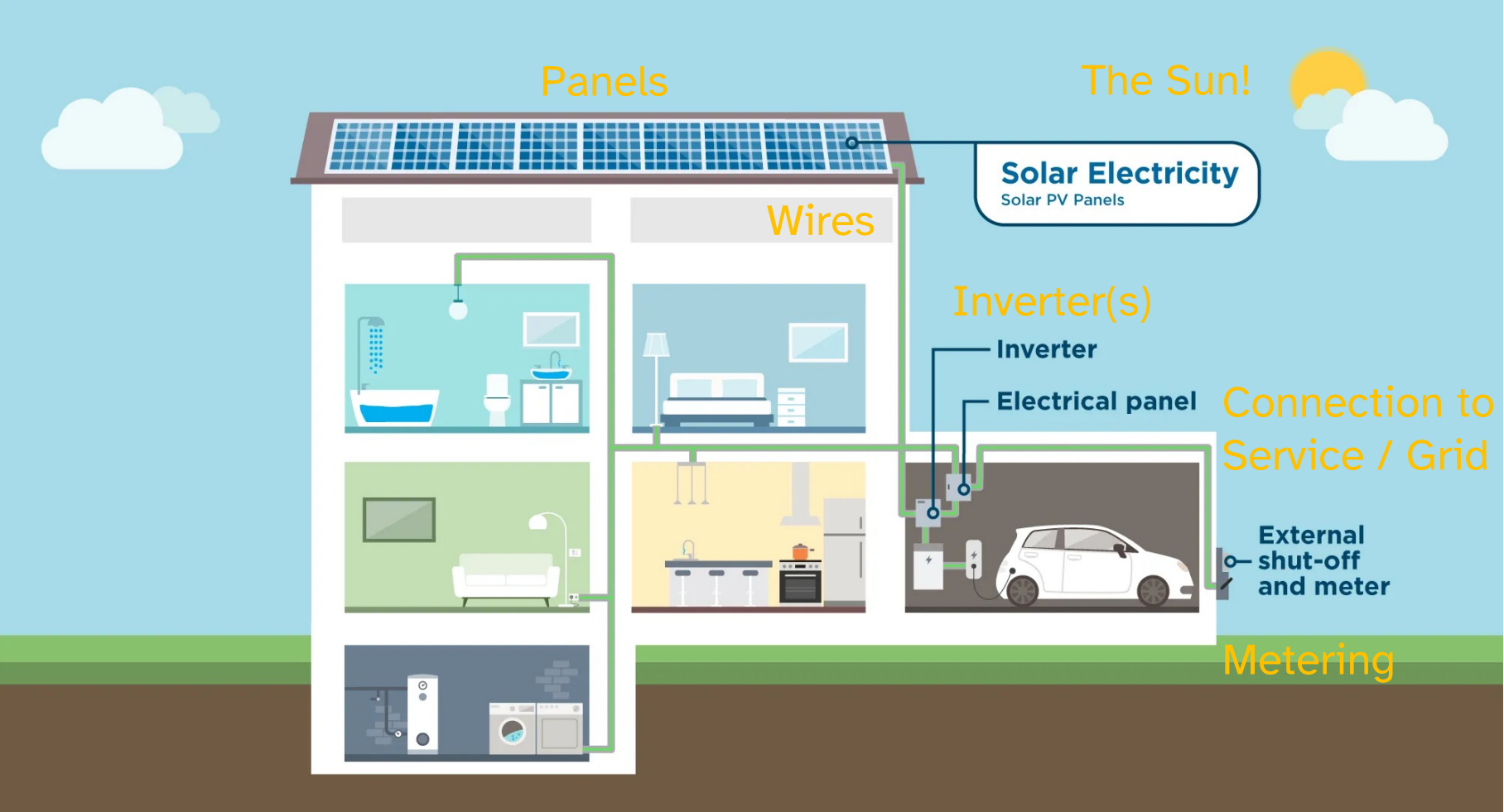
SEBANE Member

Business Development Manager, SunBug Solar

E: andy.toomajian@sunbugsolar.com



What are the ESSENTIAL components of a grid-tied solar project?



The simplest deployment strategy is on the roof!



An aerial photograph of a building under construction. The roof is white and features several rows of solar panels. There are also several air conditioning units on the roof. The building is surrounded by construction equipment and materials. The text is overlaid on the right side of the image.

Rooftop Solar - Pros and Cons:

Pros:

- Lowest cost to deploy
- Use otherwise un-used space
- Electrical service in place and close

Cons:

- Works best with long-term, owner-occupied buildings
- Roof needs to be new(er)
- Roof type issues
 - Slate, some metal shingles, etc. are difficult
 - Dormers, hips, vents, skylights - challenges on residential sites
 - Vents, HVAC, and other mechanical equipment - challenges on commercial sites
- Structural loading / engineering issues
- Shade and space issues

Ok, let's look at ground mounted solar!





Ground Mounted Solar - Pros and Cons:

Pros:

- Avoids rooftop issues and limits
- Can go to larger scales
- Flat, open land close to 3P power is best
- Generally, can be decommissioned with no permanent damage to land
- Can work on landfill / brownfield sites
 - Most viable sites in MA have been developed

Cons:

- Costs more than rooftop
 - Racking costs, excavation, wire runs, fencing, site management, permitting, etc.
- Less popular – public perception, visual impact
- Not all sites work
 - Distance from grid power
 - Wetlands / environmental issues
 - Soil stability / ledge / grade changes
 - Access for equipment
- Ties up space for single use

Can we do better than that? What about dual-use? (Parking Canopy Edition)





Parking Canopy Solar - Pros and Cons:

Pros:

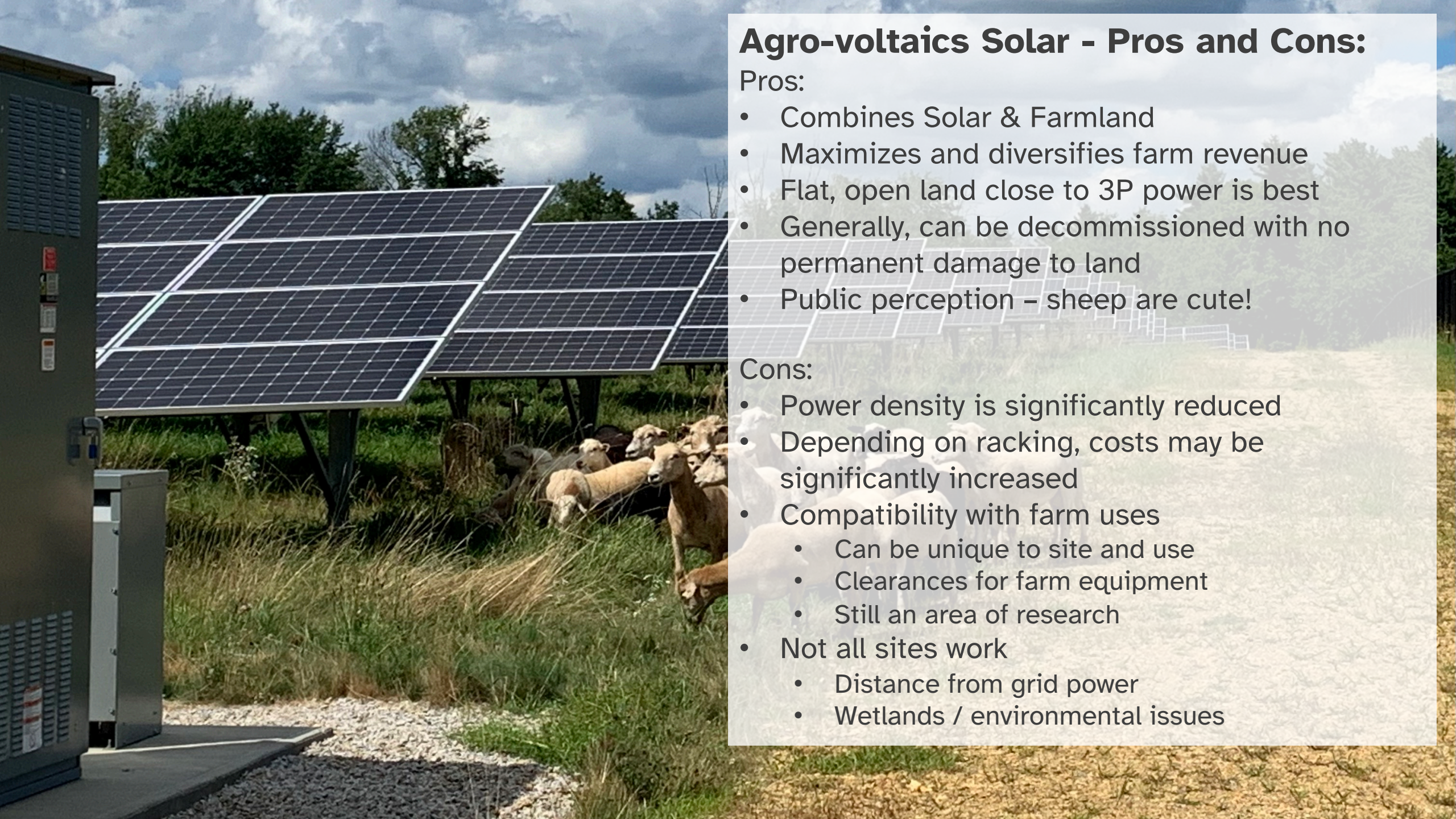
- Everyone likes shaded parking
- Reduces asphalt maintenance (and emissions)
- Almost no environmental concerns
- Can offer expansion beyond the roof, or an alternative to the roof

Cons:

- Structures are much more costly and complex than typical ground mounts
 - Height, wind uplift, public safety, clearances
- Construction disrupts business
- Can reduce parking spaces
- Height generally will not allow large trucks
- Snow shed and water run-off need to be addressed
- Scale required for viability

Can we do better than that? What about dual-use? (Agro-voltaics Edition)





Agro-voltaics Solar - Pros and Cons:

Pros:

- Combines Solar & Farmland
- Maximizes and diversifies farm revenue
- Flat, open land close to 3P power is best
- Generally, can be decommissioned with no permanent damage to land
- Public perception – sheep are cute!

Cons:

- Power density is significantly reduced
- Depending on racking, costs may be significantly increased
- Compatibility with farm uses
 - Can be unique to site and use
 - Clearances for farm equipment
 - Still an area of research
- Not all sites work
 - Distance from grid power
 - Wetlands / environmental issues



Summary / Conclusions:

- Rooftop solar is awesome, but can't do it all
- There are always challenges with any approach
- Finding way to support rooftop solar viability is important
 - Zero-carbon renovation fund
 - Re-roofing and structural upgrades
- Policies encouraging solar as part of new construction are good ideas
- The most popular options for solar off the roof are also the most expensive
- It would help to find ways to internalize the added value these approaches offer to their communities
- We probably need more of all project types to meet climate goals, so sorting out reasonable approaches to management and implementation is critical as we proceed

WESTERN MASSACHUSETTS SOLAR FORUM



Costs and Complexities of Solar Deployment Across Project Types & Scales

September 12th, 2023

Andy Toomajian

SEBANE Member

Business Development Manager, SunBug Solar

E: andy.toomajian@sunbugsolar.com

