

A photograph of a solar farm with yellow flowers in the foreground. The solar panels are visible in the background, and the sky is blue with some clouds. The flowers are in the foreground, and the solar panels are in the background.

Large-Scale Solar Development: Local Issues and Opportunities

MWCOG BEEAC MEETING, JUNE 16, 2022

About Solar@Scale

- Guidance to help local government officials promote better large-scale solar development outcomes
- Education and training to build local capacity to respond to large-scale solar development opportunities and challenges
- <https://icma.org/programs-and-projects/solarscale>



INTERNATIONAL CITY/COUNTY
MANAGEMENT ASSOCIATION



American Planning Association

Creating Great Communities for All

WITH SUPPORT FROM

U.S. DEPARTMENT OF
ENERGY | Office of ENERGY EFFICIENCY
& RENEWABLE ENERGY
SOLAR ENERGY TECHNOLOGIES OFFICE

Free Download

bit.ly/3F5Wmwa



SOLAR@SCALE

A Local Government Guidebook
for Improving Large-Scale
Solar Development Outcomes

 SOLA@SCAI

Guidebook Organization



Overview

Defining Large-Scale Solar Development

Potential Community Benefits

Potential Tradeoffs

Methods to Capture Benefits and Minimize Tradeoffs

Defining Large-Scale Solar Development

- Foundational characteristics
- Distinguishing between “small” and “large” solar energy systems
- Distinguishing between “community-” and “utility-” scale solar



Foundational Characteristics



Technology

Photovoltaic (PV)



Relationship to the Grid

Grid-connected



Relationship to the Site

Ground-mounted

Distinguishing Between “Small” and “Large” Solar Energy Systems

Rated Capacity	Site Area
5 MW	25–50 acres
2 MW	10–20 acres
1 MW	5–10 acres

Distinguishing Between “Small” and “Large” Solar Energy Systems

Characteristic	Small Solar Energy System	Large Solar Energy System
Site Area	< 1 acre	≥ 1 acre
Rated Capacity	< 250 kW	≥ 250 kW

Examples

SMALL SYSTEM AT VERMONT LAW SCHOOL



Source: [SayCheeeeeese / Wikimedia](#) (CC0 1.0)

LARGE SYSTEM ON THE CAMPUS OF UC DAVIS



Source: [UC Davis College of Engineering / Flickr](#) (CC BY 2.0)

Distinguishing Between “Community-Scale” and “Utility-Scale” Solar

Characteristic	Community-Scale Solar	Utility-Scale Solar
Site Area	1–20 acres	>20 acres
Rated Capacity	250 kW–5 MW	>5 MW

Examples

COMMUNITY-SCALE SOLAR FACILITY IN KALAMAZOO, MICHIGAN



Source: [Consumers Energy](#)

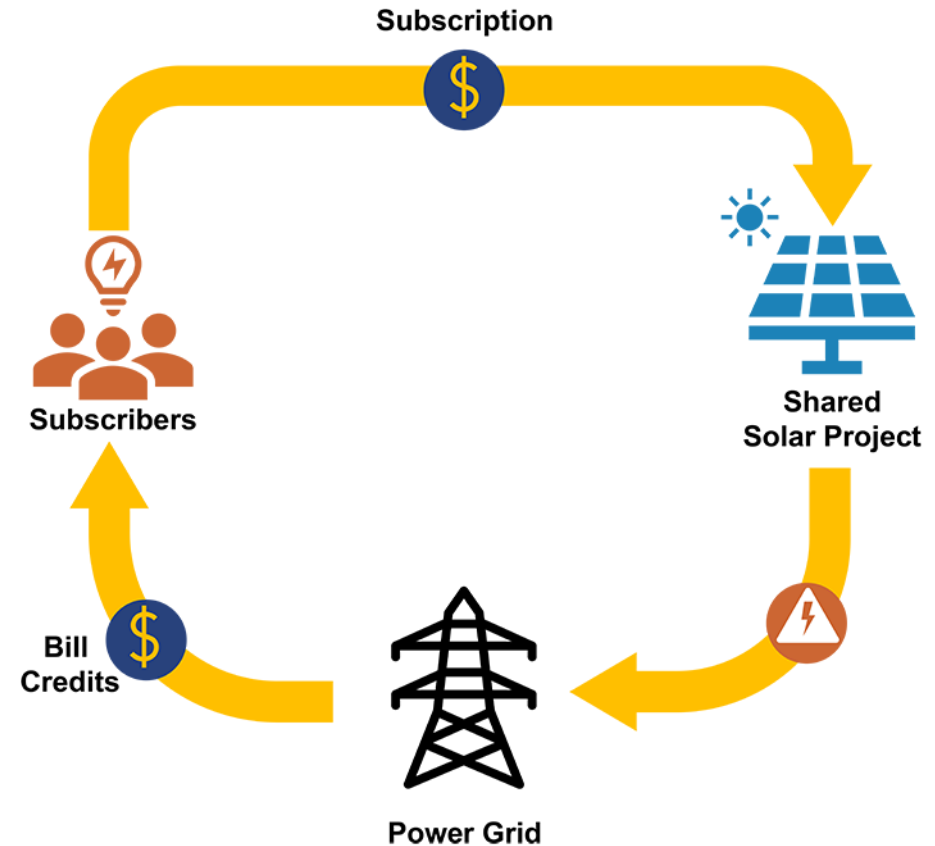
UTILITY-SCALE SOLAR FACILITY AT KENNEDY SPACE CENTER IN FLORIDA



Source: [NASA Kennedy / Flickr](#) (CC BY-NC-ND 2.0)

“Community Solar”

- Shared solar projects that allow community members to purchase ownership shares or otherwise subscribe and receive credit on their electricity bills for power produced



Potential Community Benefits

- Local Economic Development
- Direct Payments to Local Governments
- Expanded Access to Clean Energy
- Ecological Improvements



Local Economic Development

Potential Benefits	Project Features
Lease payments to landowner(s)	Developer/operator leases land for solar project
Construction jobs	Developer commits to hiring local workers
Construction multiplier effects	Project sited near suitable temporary housing and services
Workforce development	Developer commits to training local workers
Brownfield/grayfield redevelopment	Project sited on vacant or underutilized, previously developed land

Direct Payments to Local Governments or Community Members

Potential Benefits	Project Features
Property taxes	Project is subject to local property taxes
Sales or use taxes	Project is subject to local sales or use taxes and developer/workers purchase goods and services in the local economy
Payments in lieu of taxes (PILOTs)	Project is exempt from some or all local taxes but developer/operator agrees to compensate for a loss of tax revenue
Host community or neighboring property payments	Developer/operator agrees to pay to offset potential community or individual impacts or to obtain a “social license” to operate

Expanded Access to Clean Energy

Potential Benefits	Project Design Features
Increased percentage of local utility-supplied power obtained from clean, renewable energy sources	Project owned by or sells power to local utility
Local utility customers can directly purchase clean, renewable power	Project sells ownership shares or subscriptions to local utility customers (shared solar model); OR large utility customer purchases power from the project through a PPA
Lower electricity bills for individual customers	Project provides power to local utility customers at a lower rate

Ecological Improvements

Potential Benefits	Project Design Features
Improved soil quality	Project establishes new native groundcover; OR incorporates animal grazing
Improved water quality	Project establishes new native groundcover, minimizes tree removal, and protects or enhances riparian or wetland buffers
Improved crop yields	Project sited near pollinator-dependent crops and establishes new pollinator-friendly groundcover; OR sited in a hotter, drier area and designed to shade row crops

Potential Tradeoffs

- Changes to Agricultural or Other Productive Land
- Effects on Wildlands and Habitat
- Effects on Historic or Cultural Sites
- Changes to Existing Views



Changes to Agricultural or Other Productive Land

- Agricultural lands are often attractive to solar developers.



Effects on Wildlands and Habitat

- Large-scale solar development can disturb wildlands and habitat.



Source: [Alexander Wolf / Flickr](#) (CC BY-NC 2.0)

Effects on Cultural or Historic Sites

- Large-scale solar development can damage cultural or historic resources.



Source: [Lee Cannon / Flickr](#) (CC BY-SA 2.0)

Changes to Existing Views

- Large-scale solar development can affect views from neighboring properties and roads.



Source: [Don Graham / Flickr](#) (CC BY-SA 2.0)

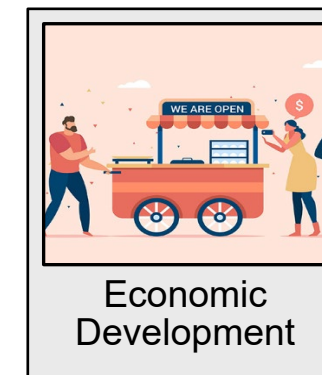
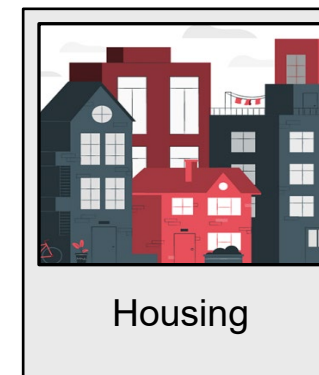
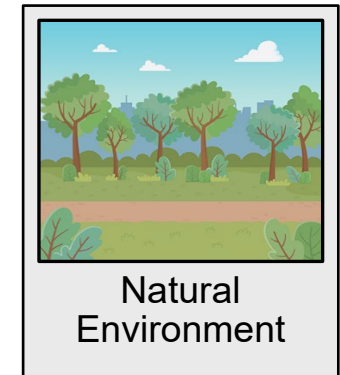
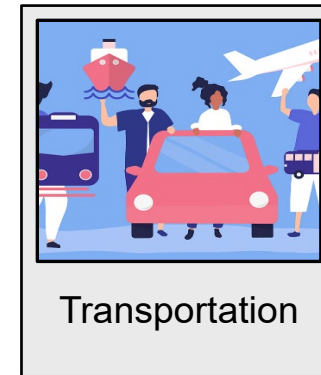
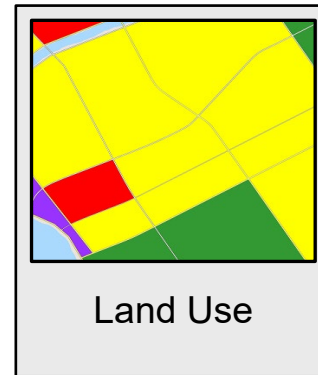
Methods to Capture Benefits and Minimize Tradeoffs

- Comprehensive Plan Updates
- Development Regulations
- Discretionary Approval Processes
- Development Partnerships



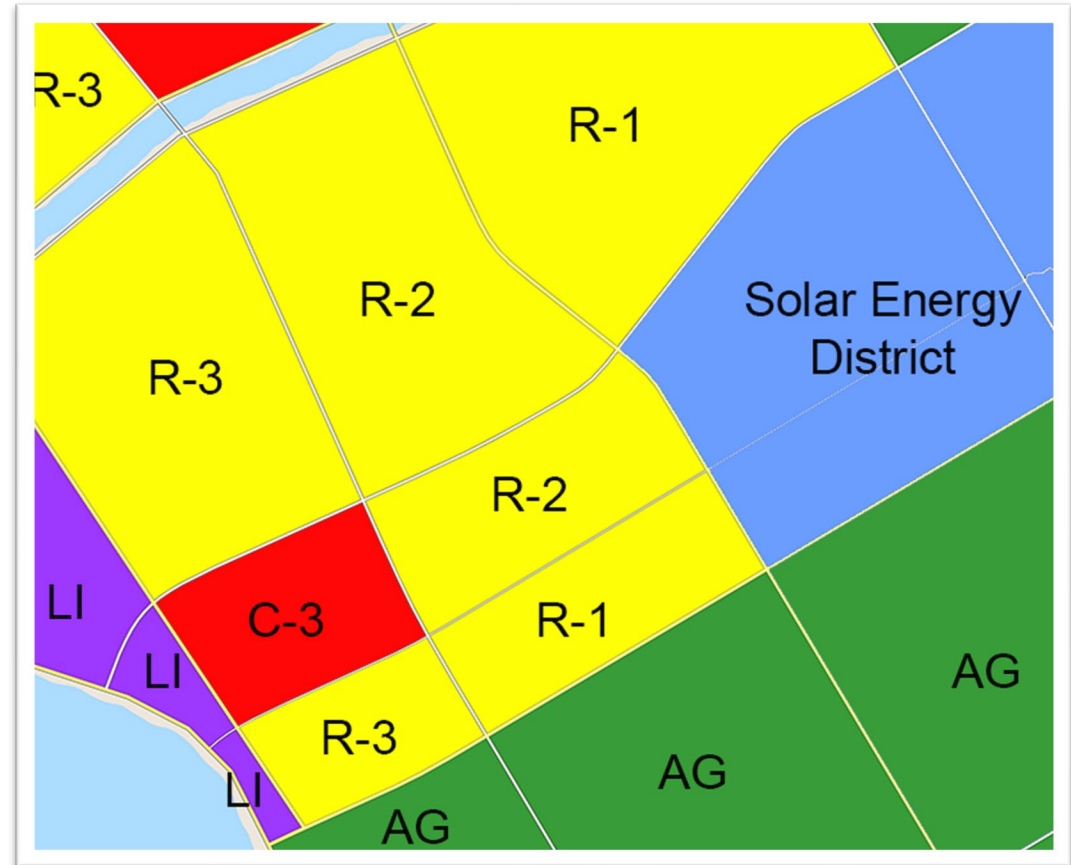
Comprehensive Plan Updates

- Provides policy support for land-use and development regulations and decisions and for public investments
- Should establish the policy basis for any benefit-capture strategy or method



Development Regulations

- Zoning standards can require or incentivize specific project types or features that confer local benefits:
 - Projects on previously developed sites (including contaminated sites)
 - Projects that combine solar power production with agricultural activities (i.e., agrivoltaics)
 - Shared solar projects that allow community members to purchase shares or subscriptions
 - Projects that establish native, pollinator-friendly groundcover; minimize tree removal; or use wildlife-friendly fencing



Discretionary Approval Processes

- Local officials can condition project approvals on the provision of certain local benefits
- Local officials can negotiate development agreements that confer local benefits that offset project impacts
- Local officials can encourage negotiations between community groups and developers to secure additional benefits in exchange for a “social license” to operate



Designed by storyset / [Freepik](#)

Development Partnerships

- Local governments can require specific community benefits if they host a solar project on local government land:
 - Brownfield redevelopment
 - Native, pollinator-friendly groundcover
 - Agrivoltaics
 - Local hiring or procurement
 - Workforce development
 - Public education
 - Opportunities for local utility customers to access power produced by the project



Designed by pch.vector / [Freepik](#)

Q&A

LARGE-SCALE SOLAR DEVELOPMENT: ISSUES AND OPPORTUNITIES