

Presenting a live 90-minute webinar with interactive Q&A

Environmental Issues in Solar Energy Projects

Pre-Project Environmental Due Diligence, Environmental Impact Review, Federal Permitting Requirements

TUESDAY, JULY 12, 2022

1pm Eastern | 12pm Central | 11am Mountain | 10am Pacific

Today's faculty features:

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HASTINGS

ENVIRONMENTAL ISSUES IN SOLAR ENERGY PROJECTS

Presentation by Jill E.C. Yung

July 12, 2022

BENEFITS AND COSTS OF SOLAR – IT'S NOT EASY BEING GREEN

- **Advantages of Photovoltaic Solar Generation**
 - Reduced environmental impacts compared to traditional generation sources:
 - Limited water use (panel washing) compared to cooling generators
 - Greenhouse gas emissions are inconsequential compared to generation through fuels combustion
 - Sustainability: renewable fuel source
 - Scalability: can be built to power a single home, complex, community, or region
- **Environmental Issues with Utility Scale Solar** (the scale needed to take fossil fuels offline)
 - Requires significant amounts of land resulting in resource conflicts
 - Conflicts with species
 - Conflicts with other biological resources (water use in the desert; loss of desert washes)
 - Conflicts with existing uses (agriculture, recreation/OHV users)
 - Impacts to cultural resources
 - Contains same hazardous materials as electronics

A BURST OF LIGHT

THE FAST TRACK PROJECTS OF 2010

- Federal financial incentives drove the approval of solar projects on public lands
 - Ivanpah Solar Electric Generating System Project (approx. 3,472 acres) [sued by Western Watersheds for species impacts]
 - Genesis Solar Energy Project (approx. 1,950) [sued by a union for water resource impacts]
 - Imperial Valley Solar Project (approx. 6,360 acres) [sued by the Quechan Tribe for tribal and cultural resource impacts]
 - Chevron Energy Solutions Lucerne Valley Solar Project (approx. 422 acres)
 - Calico Solar Project (approx. 4,613 acres) [challenged by Sierra Club for species impacts]
 - Blythe Solar Power Project (approx. 7,025 acres)
- Several of these projects were never built

ADDRESSING LAND USE CONFLICTS - CRITERIA BASED APPROACHES

eNGOs' RENEWABLE SITING CRITERIA, JUNE 2009

- Areas to Prioritize for Siting:
 - Lands near transmission, waste water, urban load and workforces - with existing roads
 - Brownfields and lands that have been “type-converted” from native vegetation through plowing, bulldozing or other mechanical impact
 - Public lands of comparatively low resource value located adjacent to degraded and impacted private lands
- High Conflict Areas to Avoid:
 - Critical habitat for and significant⁶ populations of federal or state threatened and endangered species and sensitive, rare and special status species
 - Areas of Critical Environmental Concern, Wildlife Habitat Management Areas, and lands purchased or planned for conservation
 - Landscape-level biological linkage areas required for the continued functioning of biological and ecological processes
 - Proposed Wilderness Areas, proposed National Monuments, and Citizens' Wilderness Inventory Areas

ADDRESSING LAND USE CONFLICTS - CRITERIA BASED APPROACHES

BLM INSTRUCTION MEMORANDUM 2011-061, FEBRUARY 2011

- Low Potential for Conflict – timely or expedited authorizations possible:
 - Lands specifically identified for solar or wind energy development in BLM land use plans
 - Previously disturbed sites or areas adjacent to previously disturbed or developed sites
 - Locations that minimize construction of new roads and/or transmission lines
 - Lands adjacent to designated transmission corridors
 - Lands currently designated as Visual Resource Management Class IV
- Medium Potential for Conflict – projects that have resource conflicts that can potentially be resolved:
 - Designated BLM special management areas, including ACEC areas, that provide for some limited development
 - Lands with wilderness characteristics outside Wilderness and Wilderness Study Areas that have been identified in an updated wilderness characteristics inventory
 - Areas where project development may adversely affect properties listed in the National Register of Historic Places or areas with sensitive cultural and/or historic resource values and other designated areas such as National Natural Landmarks and National Historic Landmarks
 - Areas where project development may adversely affect National Historic and Scenic Trails and National Recreation Trails
 - Sensitive habitat areas, including important eagle use areas, priority sage grouse habitat, riparian areas, or areas of importance for Federal or state sensitive species
- High Potential for Conflict – areas where projects should be impossible

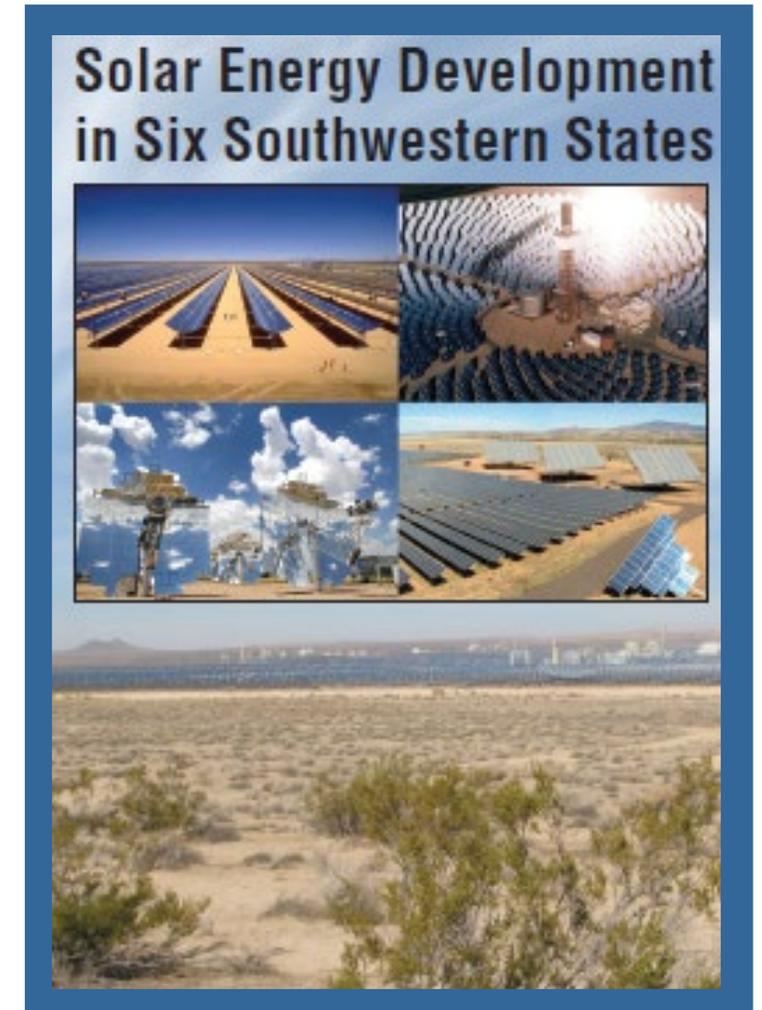
ADDRESSING LAND USE CONFLICTS - CRITERIA BASED APPROACHES

CALIFORNIA DESERT & RENEWABLE ENERGY WORKING GROUP, MAY 2011

- Recommended Criteria for Identifying Areas for Facilitated Development under the Western Solar Plan
 - Mechanically disturbed lands such as fallowed agricultural lands
 - Brownfields, idle or underutilized industrial areas
 - Locations adjacent to urbanized areas and/or load centers where edge effects can be minimized and minimal additional infrastructure would be necessary
 - Public lands of comparatively low resource value located adjacent to degraded and impacted private lands on the fringes of BLM-managed land
 - Locations that have been repeatedly burned and invaded by fire-promoting non-native grasses
- Areas that should be avoided:
 - Lands within one mile of lands designated by Congress, the President or the Secretary of the Interior for the protection of sensitive resources
 - Lands that have been formally proposed by federal agencies for designation as wilderness or proposed for a national monument.
 - Lands that were originally part of a renewable energy right of way application and were eliminated from a ROW application by BLM or the applicant due to resource conflicts *prior to or following the finalization the PEIS*
 - Lands that have conservation value and were purchased with federal, state or private funds, and donated or transferred to the BLM for conservation purposes or that were acquired for project mitigation

LANDSCAPE LEVEL PLANNING: BLM'S WESTERN SOLAR PLAN

- Finalized in October 2012 by the Bureau of Land Management for development on public lands
- Created a blueprint for utility-scale solar energy permitting in Arizona, California, Colorado, Nevada, New Mexico, and Utah.
 - Designated 17 “Solar Energy Zones” totaling 285,000 acres with SEZ-specific design features and long-term requirements for monitoring and mitigation (since increased to 19 zones)
 - 19.3 million acres of land available in variance areas (medium and high conflict lands (identified using the criteria in IM 2011-061) excluded; insolation and slope exclusion criteria artificially restrict development on large expanses)
 - Subsequent rulemaking established a competitive process for securing SEZ lands



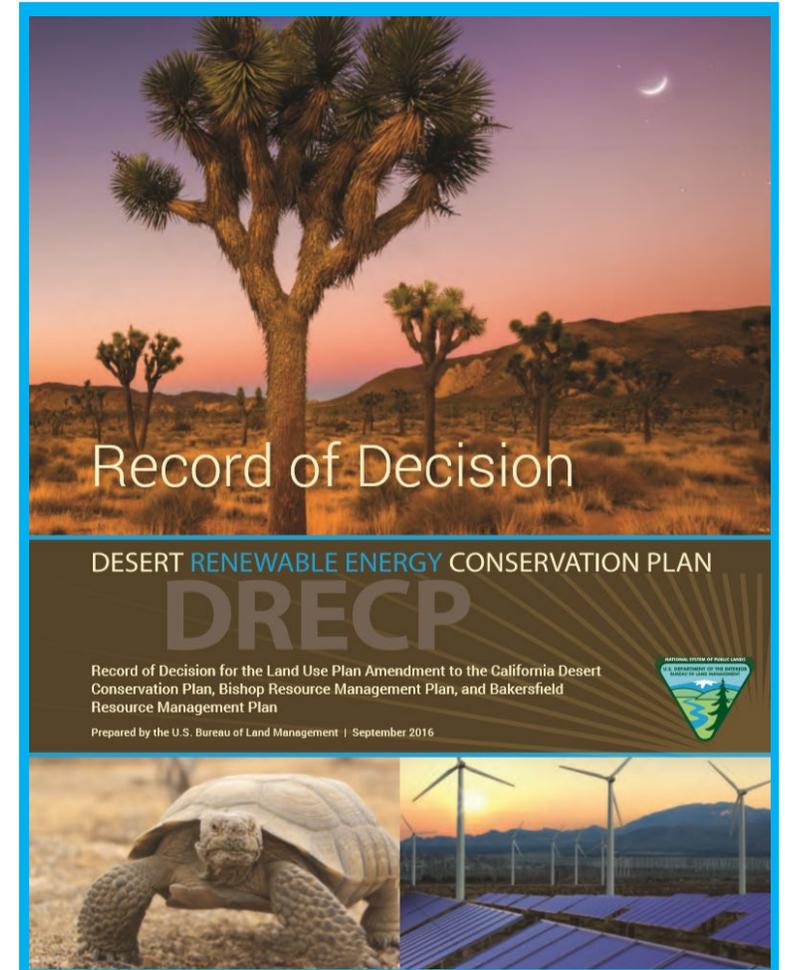
EXCLUSION ZONES

- 32 types of areas, or specific locations, where solar development is not allowed, including:
 - Lands with slopes greater than 5% or solar insolation levels less than 6.5 kWh/m²/day
 - All Areas of Critical Environmental Concern (ACECs) identified in applicable land use plans
 - All designated and proposed critical habitat areas for species protected under the Endangered Species Act (ESA)
 - Lands within a solar energy development application area found to be inappropriate for solar energy development through an environmental review process that occurred prior to finalization of the Draft Solar PEIS
 - All Desert Tortoise translocation sites identified in applicable land use plans, project-level mitigation plans or Biological Opinions.
 - Areas with various biological, historic, tribal or cultural resource values

See table A-2 in the PEIS (<https://blmsolar.anl.gov/documents/docs/peis/Exclusions-ROD-Table-A-2.pdf>)

LANDSCAPE LEVEL PLANNING: BLM'S DESERT RENEWABLE ENERGY CONSERVATION PLAN

- Adopted September 14, 2016
- Covers 10.8 million acres of BLM-managed lands in Imperial, Inyo, Kern, Los Angeles, Riverside, San Bernardino, and San Diego Counties (California), including:
 - Development Focus Areas (DFAs) – 388,000 acres where solar, wind, and geothermal renewable energy development and associated activities are allowable uses, provided they follow HUNDREDS of prescribed Conservation Management Actions (CMAs)
 - Variance Process Lands (VPLs) – 40,000 acres conditionally recognized for possible development.
 - Unallocated Lands – 419,000 acres of General Public Lands and 35,000 acres of Extensive Recreation Management Areas (ERMAs) where renewable energy development may be approved pursuant to a land use plan amendment (LUPA)



DEVELOPABLE PUBLIC LANDS IN CALIFORNIA

Renewable Energy Development

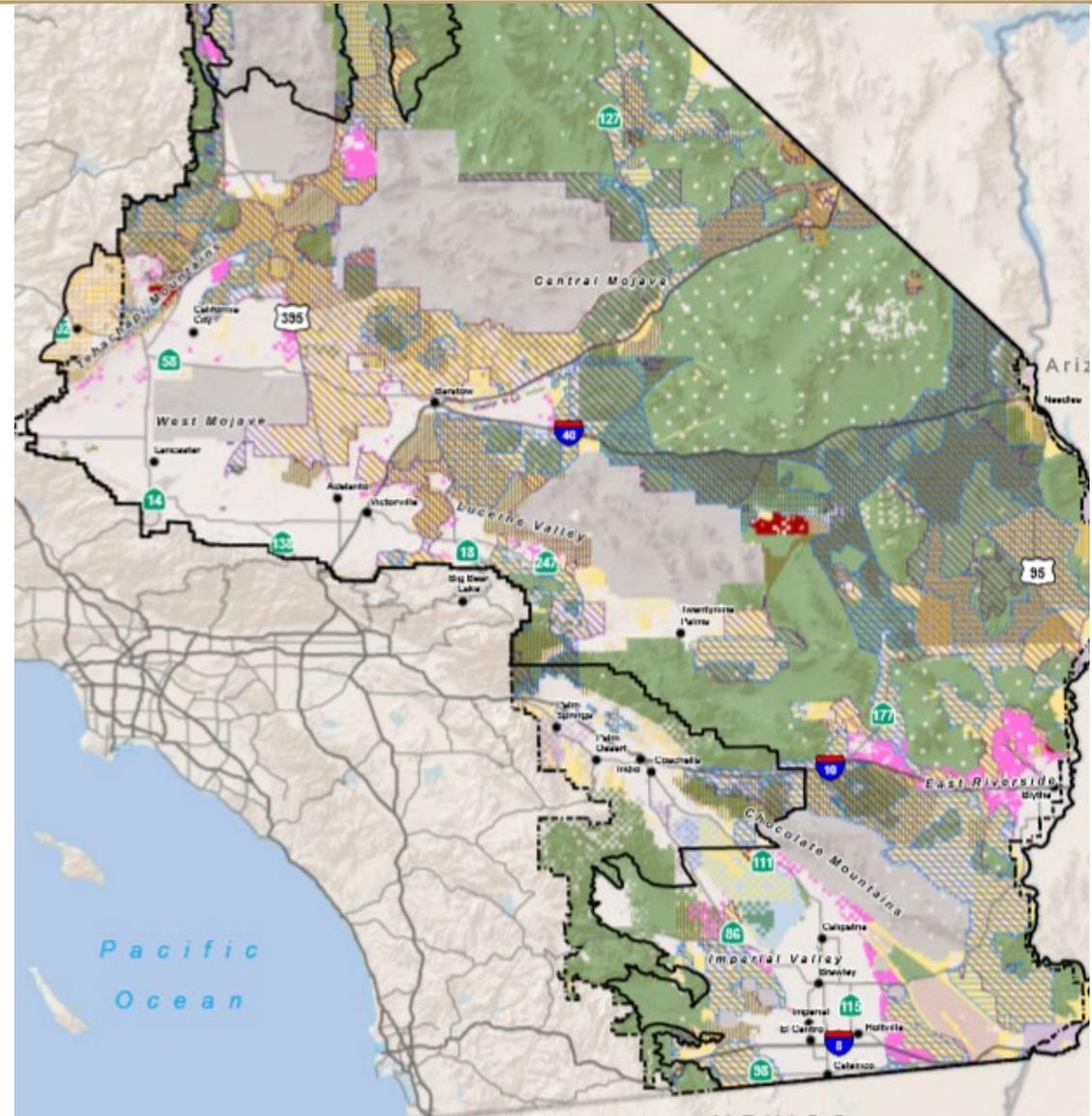
- Development Focus Areas
- Variance Process Lands

BLM LUPA Conservation and Recreation Designations

- California Desert National Conservation Lands
- Areas of Critical Environmental Concern
- Wildlife Allocation
- Special Recreation Management Area
- Extensive Recreation Management Area
- National Scenic Cooperative Management Area

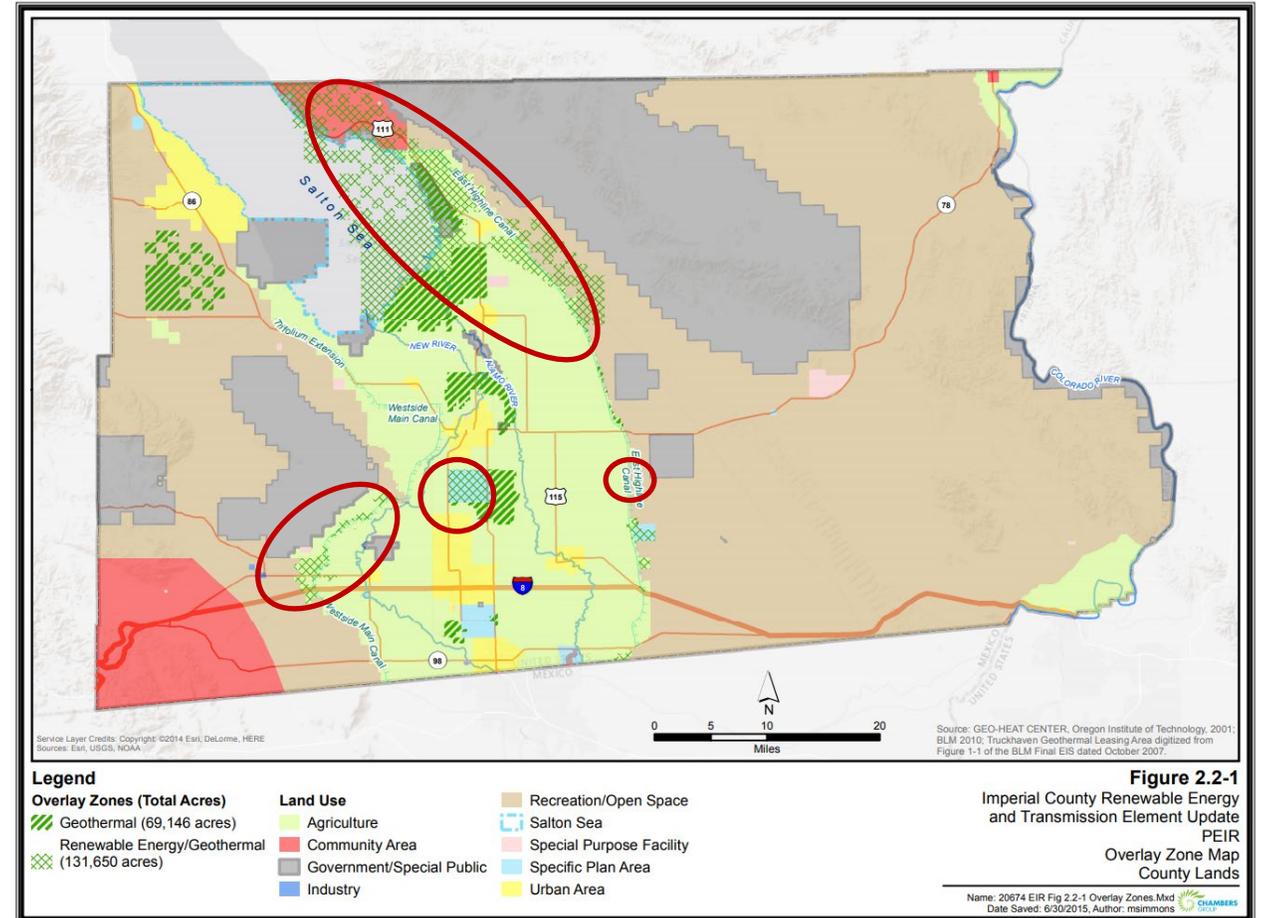
Base Layers

- Legislatively and Legally Protected Areas
- Military Expansion Mitigation Lands
- Military
- Open OHV Areas - Imperial Sand Dunes
- Open OHV Areas
- Johnson Valley OHV Shared Use Area
- Tribal Lands
- United States Bureau of Land Management
- NDAAs China Lake Expansion
- ODCA Plan Boundary
- DRECP Plan Area Boundary



LOCAL PLANS

- Local land use planning tools have been used to control siting decisions as well
- Decisions are based more on the value of land for other uses – limited areas are left for solar if the local jurisdiction prioritizes agriculture
- Property tax exemptions in California for solar can reduce incentives for local jurisdictions to create supportive environments



LANDSCAPE PLANNING REDUCES, BUT DOES NOT RESOLVE RESOURCE CONFLICTS

- Biological Issues: Endangered, Threatened, and BLM Special Status Species; possible consultation with USFWS
- Tribal Issues: Section 106 Consultation
 - Difficult to find sites that do not impact in some way Tribes' connection to the broader landscape through historic trails and resources that are not archeologically significant, but have meaning for tribes
- Other land use issues, e.g. BLM Energy Corridor conflicts, 404 Permit (waters of the US), sand transport assessments
- Visual Resource Management issues: Class 4 is ok; Class 3 is fairly easy to amend; Class 2 and Class 1 can be difficult
- Other Resource issues: review OHV and other uses that may generate opposition

OTHER ENVIRONMENTAL ISSUES – DISPOSAL OF E-WASTE

- PV modules may exhibit the hazardous waste characteristic of toxicity due to the presence of heavy metals such as cadmium, copper, lead, antimony or selenium
- Effective January 1, 2021, the California Department of Toxic Substances Control designated PV modules as universal waste, to be managed under the State's universal waste management standards
 - This rule will make the storage, transportation and management of decommissioned panels less burdensome – assuming they would otherwise exceed hazardous waste thresholds that make disposal more costly and onerous
- Whether California becomes a model for other states or the EPA remains to be seen, as we are still decades away from the decommissioning of a significant number of panels when they reach the end of their life expectancy (expected 25-40 years)
 - In November, 2021, the Edison Electric Institute, American Clean Power Association, National Association of Manufacturers and others petitioned US EPA to adopt a universal waste management standard for PV solar panels

INCREASING SENSITIVITY TO ENVIRONMENTAL CONCERNS, BUT IS THE PENDULUM SWINGING BACK?

- California just adopted AB 205, which allows applicants to opt-in to a comprehensive permitting process for non-fossil-fueled power plants, energy storage facilities and related facilities to be administered exclusively by the California Energy Commission
- Allows a CEC consolidated permit to replace all local, most state, and (where permitted by law) federal permits
- CEC must take final action within 270 days unless certain extensions apply
- Projects must hire a skilled and trained workforce, pay prevailing wages, provide community benefits, “take feasible measures to avoid or minimize adverse impacts to tribal cultural resources” and “solicit the traditional ecological knowledge of the California Native American Tribes”
 - All measures designed to mollify frequent project opponents
 - No environmental siting criteria specified
 - Resource protection agencies (i.e., the California Department of Fish and Wildlife) must be consulted in prescribed ways, but are ultimately stripped of their permitting authority
 - Justified by the climate crisis and acute need for more reliable, clean energy to come online

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Environmental Issues in Solar Energy Projects

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July 12, 2022

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Impacts of Solar Energy Projects

- The GOOD:
 - Compared with other energy projects, solar energy generating facilities are fairly benign to operate (no ongoing fuel deliveries, low-noise, little to no air-emission).
 - The lifecycle greenhouse gas emissions of solar (from manufacturing, operation and maintenance, and decommissioning) are estimated to be less than 1/20th of the emissions of coal generation.
 - Amenable to smaller scale and on-site generation/distributed generation models.
 - Potential for co-location/continuation of other uses (e.g., agricultural – beekeeping, sheep grazing)
- The Not-So-Good:
 - Projects generally occupy and require large land areas to produce similar quantities of electricity (between 4-8 Acres/MW AC).
 - Some argue they are visually intrusive.
 - Potential impacts on habitat, wildlife, wetlands, agricultural lands, and open space will be commensurate with the scale of the proposed project.
- The Job:
 - Understanding and identifying the key impacts upfront.
 - Knowing the appropriate regulatory agency or body and standards of review.
 - Identify critical and concurrent paths to substantially reduce time and cost of reviews.
 - Know the phrase: “Avoidance, Minimization, and Mitigation.”

The Environmental Review Process

- Location and size of the Project primarily shape the environmental review, along with choice of Technology (PV vs. CSP) and design.
 - Public vs. Private land
 - State vs. Federal jurisdiction
 - Local vs. State-wide process
- The Bureau of Land Management (BLM), part of the U.S. Department of Interior, permits development of solar on federal public lands.
 - Consistent with Land Use Plans (LUPs) required under the Federal Land Policy and Management Act (FLPMA)
 - Review pursuant to National Environmental Policy Act (NEPA) of 1969
 - Endangered Species Act (ESA) – Article 7 Consultation
- Some states will have additional requirements
 - New York's Take Permits and Species of Interest rules

The Environmental Review Process

- For projects being proposed on private lands, State and local regulators take the lead.
 - The size of the projects may determine both the jurisdictional entity and the environmental review process.
 - In NY – “large scale” solar projects (over 25 MW) are required to seek approval through the Office of Renewable Energy Siting (ORES), rather than local zoning, which has its own unique environmental review. (20-25MW projects can chose ORES or the local zoning route)
 - Smaller projects will be reviewed by the municipality, subject to local zoning laws.
- In many jurisdictions, the review processes will have additional requirements and potentially stronger standards like those found in NY’s State Environmental Quality Review Act (SEQRA) – which mandates certain impacts that cannot be avoided, be minimized to the “maximum extent practicable,” and then mitigated to achieve a “net-conservation benefit.” Local zoning codes may have strict
- Regardless of the review process, common potential impacts are considered:
 - Threatened or endangered species and habitats
 - Wetlands and related buffers
 - Need for efficient land use/preservation of Agricultural resources

Habitat – Endangered Species Act

- Projects that may affect threatened or endangered species or their habitat must comply with the Endangered Species Act, which requires that any federal agency authorizing, funding, or carrying out any action that may affect protected species consult with the U.S. Fish and Wildlife Service (FWS).
- Developers should engage the FWS and other agencies regarding impacts to species protected by the ESA. For utility-scale solar projects requiring federal approval, an ESA Section 7 consultation will occur as part of the federal permit review process.
- Although consultation is required only for activities that involve federal action or approval, it is advisable to consult FWS if there is even a possibility for protected species impacts due to potential liability under ESA Section 9 (a strict liability provision that does not require intent or knowledge of a violation)

Mitigation

- Projects utilize mitigation plans to limit impacts or compensate for unavoidable impacts.
- Mitigation is often the result of extensive negotiation with the various stakeholders beyond state and federal regulators, including tribal authorities, environmental advocates, and host communities.
- Mitigation plans can be extensive – and expensive.

Mitigation Examples

- The Ivanpah Solar Electric Generating System
 - Desert Tortoise Translocation Plan and a Revegetation and Reclamation Plan, which included the purchase of 4,000 acres of land to relocate the tortoise and other sensitive plant and animal species.
- The Crescent Dunes Solar Energy Project
 - Installed and maintained transmission lines to ensure the least possible interference with local bird populations, while also monitoring the nest of a nearby endangered golden eagle during and after construction.
 - 8-foot high fences were installed around the evaporation ponds to protect small wildlife creatures.
- The California Valley Solar Ranch
 - Eliminated an array to reduce impacts on the Giant Kangaroo Rat, and promoted wildlife migration by reducing fencing.

Migratory Bird Treaty Act (MBTA)

- Under the MBTA, it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg of any such bird, unless authorized under a permit issued by the Secretary of the Interior.
 - Some regulatory exceptions apply.
 - “Take” is defined in regulations as: ‘pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.
- Be Aware of Definitions and Policies:
 - Under the Obama Administration, the MBTA was interpreted to cover “incidental” take – but this was rolled back during the Trump Administration, exclude the prohibition on incidental take. The Biden administration restored the “incidental take” prohibition, but has proposed additional permitting rules.
 - NY specifically requires “incidental take permits” under ECL § 11-0535

Wetlands

- Clean Water Act provisions must also be met if a solar project will cause a discharge of pollutants into certain surface waters or require filling wetlands.
 - This may trigger consultation with the US Army Corp of Engineers (ACOE) and the need for a Section 401 Water Quality Certification.
- Developers should strive to avoid stream and wetland impacts, including limiting stream crossings for access roads where possible; avoiding alteration of existing drainage systems; and implementing best practices for preventing erosion and sedimentation during site construction activities by:
 - Minimizing soil disturbance associated with moving unwanted vegetation near wetland areas;
 - Limiting erosion, overland flow, and runoff that could impact wetlands;
 - Maintaining the natural contour of the site and ensuring that activities do not immediately or gradually convert the wetland to a non-wetland

Efficient Land Use – Best Practices

- Conduct early mapping to identify biological and cultural resources, agricultural lands, and locally important resources (open space, historic, aesthetic).
- If sensitive areas are involved, work with state and local agencies to minimize disturbances to wildlife and associated habitat and impacts to wetlands.
- Look for dual use opportunities – develop on existing brownfields, landfills, and agricultural properties where ag uses can continue, and use existing roads where possible.
- Employ sustainable grounds keeping techniques and plant native species of shrubs and groundcovers, such as grasses and wildflowers
 - Native fruiting and flowering plants provide a food source and habitat for wild native bees

Dual Land Use Examples



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Agricultural Land Impacts

- Some states have expressed concern over loss of prime agricultural soils during construction and removal from production of prime food/fiber production areas.
- Best practices include:
 - Avoiding areas with the most productive soils
 - Repair all surface or subsurface drainage structures damaged during construction to as close to preconstruction conditions as possible.
 - Mitigate any surface or subsurface drainage problems resulting from construction.
 - Install structures for overhead collection lines in nonagricultural areas and along field edges, where possible. If structures must be located in active agricultural fields, they should be aligned with crop rows.

Decommissioning

- Decommissioning can have negative impacts if not carefully carried out. The same best practices should be used as for construction. Project decommissioning plans will be permit conditions analyzed in the NEPA/state review process.
- Typical decommissioning requirements upon discontinuance of the solar energy system:
 - Remove all above ground structures and restore all areas, particularly those previously used for agricultural production
 - Remove all concrete piers, footers, or other supports to a depth of 48 inches below the soil surface
 - Underground electric lines should be abandoned in place
 - Access roads in agricultural areas should be removed, unless otherwise specified by the landowner
 - All agricultural areas temporarily disturbed by construction should be decompacted

Final Thoughts

- Early Identification of Environmental Issues is Not a Matter of Choice – But Law.
 - In NY, Applicants proposing to build a Major Solar Energy Generating Facility are required to engage in specific Pre-Application procedures [19 NYCRR 900-1.3] intending to identify significant environmental concern, including:
 - Consult with local Agencies
 - Meeting with Community Members
 - Wetlands Delineation
 - Water Resources and Aquatic Ecology [i.e. surface water delineations]
 - NYS Threatened and Endangered Species [i.e. wildlife site characterization/habitat assessments]
 - Archaeological Resources Consultation [potentially requiring Phase I and/or Phase II Environmental surveys].

Follow up Questions?

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