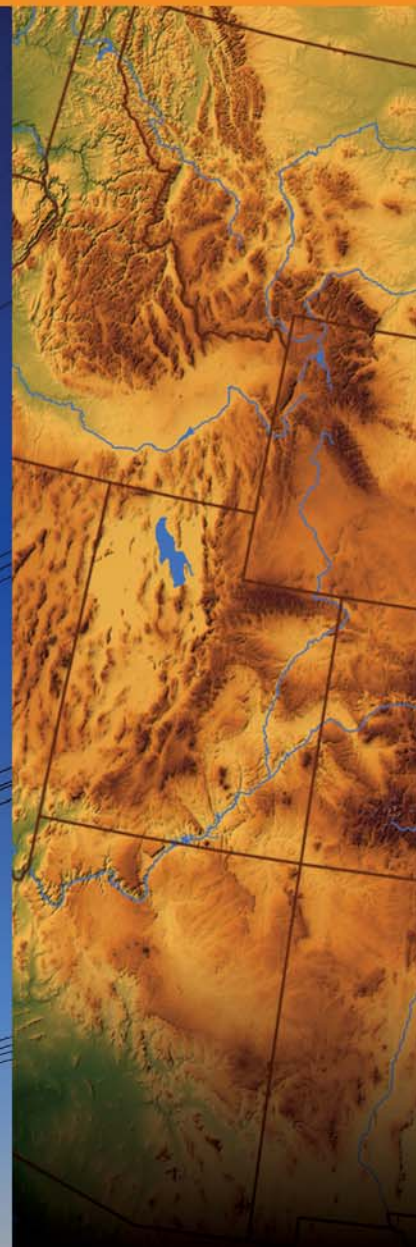
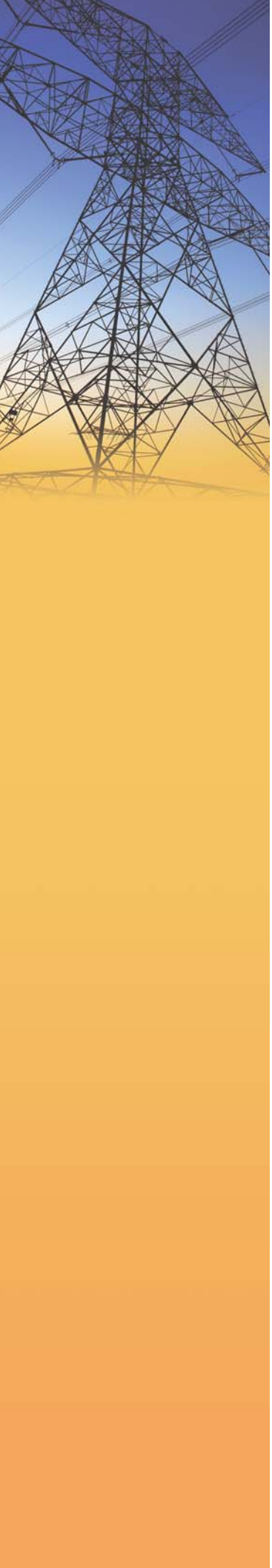


Renewable Energy Transmission Roadmap



Western
Governors'
Association

June 2010



This report will be updated regularly to reflect new information.

Western Governors' Association
Renewable Energy Transmission Roadmap
June 2010

Table of Contents

Preface 2

Introduction 3

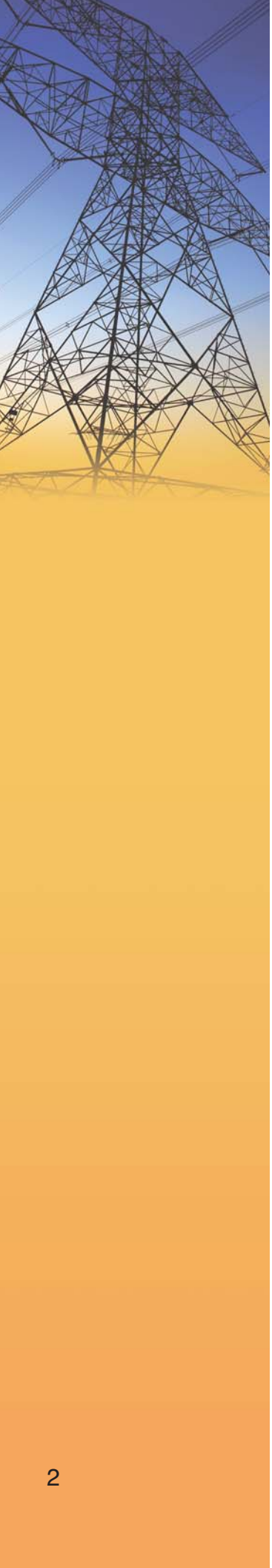
Overview of Renewable Energy Project Development 4

Key Permitting Considerations in the Western U.S. 7

Keys for a Successful Project 11

Conclusion 11

Notes 12



Preface

The Western Governors' Association is an independent bipartisan association of 19 States and 3 U.S. Flag Pacific Islands. Through their Association, Governors identify and address key policy and governance issues in natural resources, the environment, human services, economic development, international relations and public management.

Governors select issues for review based on regional interest and impact. The WGA helps the Governors develop strategies both for complex long-term interests facing the West, and for the region's immediate needs. Governors use WGA to develop and advocate policies that reflect regional interests and relationships in debates at the national and state levels. The WGA also acts as a center of innovation to find promising solutions for problems in the region. The WGA has been involved in energy policy issues¹ through resolutions, initiatives, studies and reports, and through the activities of the Western Interstate Energy Board², which serves as the energy arm of the WGA.

In December of 2009, the United States Department of Energy awarded the WGA \$12 million in grants, funded from the American Recovery and Investment Act of 2009, to assist 11 states in the Western Interconnection in planning for new electric transmission infrastructure considering future demand, diversity of resources, environmental concerns and energy efficiency³.

On December 2, 2009, Governor Brian Schweitzer stated the following in a letter⁴ to Robert Kondziolka, then Manager of Transmission Planning at Salt River Project and Chairman of the Southwest Area Transmission planning group:

"One of the most frustrating issues that developers can face is the daunting process of understanding how to facilitate and expedite transmission siting and permitting. By providing even this basic information, especially to small and medium developers, we can bridge the disconnect between project conception and delivery of critical power to load centers. The WGA staff has informed me that you have graciously volunteered to put together a basic interstate roadmap that will help developers navigate siting and permitting."

Rob Kondziolka of Salt River Project and Greg Bernosky of Arizona Public Service provided valuable guidance in the preparation of the Roadmap. We would also like to thank the engineering and consulting firm of K.R. Saline & Associates, PLC for their assistance in preparing this document.

Introduction

Renewable energy is becoming an increasingly large part of state energy portfolios in the West. However, the continued expansion of renewable energy is primarily dependent on the availability of transmission.

Development of a renewable energy project in the Western United States is formidable and requires interested parties to navigate a path of complex federal, state and local regulatory approvals and permits. Encircling this process is the electric utility industry and the variety of studies, technical modeling processes, economic assessments and operational requirements that often drive the development of electric infrastructure.

To assist in navigating the renewable energy development process, the Western Governors' Association has prepared this "roadmap" of the steps an energy project, be it generation or transmission, typically takes from concept to construction. The document highlights key information compiled from existing national, regional, and state studies, and directs the reader to sources of information that contain additional details. It identifies key issues that typically face energy development projects in the Western U.S. and some strategies for addressing challenges that may arise along the way. The overall objective is to assist energy projects as they get underway by providing an outline of development activities, including process, timing, potential hurdles and key stakeholders.

No document could cover all of the processes or issues that might arise in each state within the WGA footprint. For that reason, energy project developers are encouraged to identify and work with local agencies and stakeholders in their specific geographical area, confer with organizations that support the development of energy projects, and engage professionals in relevant disciplines in order to maximize the potential for project success.

Organization of the Roadmap

This document is organized in three sections:

- Overview of Renewable Energy Project Development
- Key Permitting Considerations in the Western U.S.
- Keys for a Successful Project

These sections are supplemented by concluding remarks and links to an online glossary of frequently used electric industry terms and relevant supporting appendices.



Overview of Renewable Energy Project Development

The need for adequate, reliable, economical, and diverse energy infrastructure to supply electric energy for residential, commercial and national security purposes is unquestioned⁵. While federal and state incentives, such as tax credits and renewable portfolio standards, have encouraged development of these projects, completing renewable energy projects remains extremely complex. The projects are highly capital intensive and require integration with existing energy infrastructure, natural resources and the human environment.

Issues Facing Project Developers in the West⁶

Although project permitting and transmission interconnection might be seen as separate processes to a novice developer, they are closely interrelated. The identification and definition of a proposed renewable energy project is an iterative one involving the interrelationships between financial considerations, such as costs of permitting and needed infrastructure, as well as the period of time that will be required to complete the process.

Selling Power to Utilities

The production and sale of electric energy is regulated by state and federal authorities. The Federal Energy Regulatory Commission (FERC) regulates the wholesale sale of electric energy in interstate commerce⁷. This regulation may apply even though energy is generated and sold in the same state⁸. Because of the specialized knowledge and experience needed to navigate the FERC regulatory scheme⁹, renewable generation developers are encouraged to confer with competent advisors to assess the need to obtain FERC authorization in order to sell electric energy to wholesale purchasers. The process of obtaining FERC approval can be relatively simple, or more complex, depending upon the status of the applicant and its ability to exercise market power. Market power refers to the ability of an entity to control or alter the price of electric energy because of its large capacity.

A generation developer may sell electric energy to a utility either through a power purchase agreement (PPA) or on the open market. A PPA refers to a contract between a generator and a utility for the sale of electric energy. Utilities may issue "Request for Proposals" (RFP) in accordance with integrated resource plans.¹⁰ A typical RFP (and resultant PPA) includes the amount of electric energy required (MWh), technology/resource categories sought, term of the contract, commercial operation date, delivery point(s), transmission service options¹¹, maximum bid price, handling of renewable energy credits, and criteria used for evaluation.

When deciding from which generators to purchase energy, some utilities are required to use project feasibility or viability evaluation criteria established by governmental regulations; others will use internally developed standards.

Renewable energy projects can be affected by a number of very difficult issues, including:

- Transmission capacity is limited, and renewable resources can be, and often are, remote from urban load centers or existing transmission infrastructure.
- Developers frequently encounter public opposition to their projects, based upon perceived aesthetic and economic impact of the infrastructure that is necessary to generate and transmit renewable energy.
- The Western U.S. is host to large amounts of public land, requiring evaluation of environmental impacts by multiple Federal agencies.
- State and local government, environmental, land use and regulatory approvals are required on non-federal lands.
- Requirements imposed by various agencies and units of government are potentially in conflict with one another.
- Regulatory processes can lack coordination and synchronization.

Typical evaluation criteria might include the following, with each criterion receiving a different weight depending upon the utility:

- Price.
- Developer experience: Ability to finance prior projects; creditworthiness; engineering, procurement and construction experience; ownership and operation of other facilities.
- Technology assessment: Complexity of design; maturity; reliability; efficiency; availability; costs; comparison to technology in development; ease of construction.
- Transmission elements: Scope of work for interconnection facilities and upgrades; anticipated length of time for studies, procurement of necessary equipment, engineering and construction.
- Site control: Options to purchase; leases; ownership.
- Permitting: Complexity; sequence; likelihood of success; anticipated completion date.

Transmission Interconnection Basics

An interconnection to a transmission system is required in order to transmit the energy produced to the utility purchasing the power. An interconnection provides the right to inject power, but does not convey any rights to transmit the power. Transmission service is required in order to transmit the power, and there is a separate process to acquire transmission service. The interconnection process is the procedural path a generation developer must follow prior to transmission interconnection approval. The interconnection process is initiated when the generation developer submits an “Application for Interconnection” (with the required deposit and proof of site control) to the transmission owner. The application is submitted after the power producer has conducted a preliminary assessment of project feasibility.

The application study process is formalized when the “Application for Interconnection” is

approved by the transmission owner, typically within 10 days of receipt of the application. A series of up to three technical studies is required to establish system reliability, system upgrade requirements, and to allocate costs. A typical technical study process for interconnection is illustrated in *Figure 1* below.



Figure 1 - Overview of Typical Technical Study Work Process

The interconnection process establishes technical viability of a generation project, and defines the costs for the equipment and network upgrades necessary to allow for injection of the proposed resource by the generator, in a manner that will not impact the reliability of the grid. It also allocates the costs for the needed facilities.

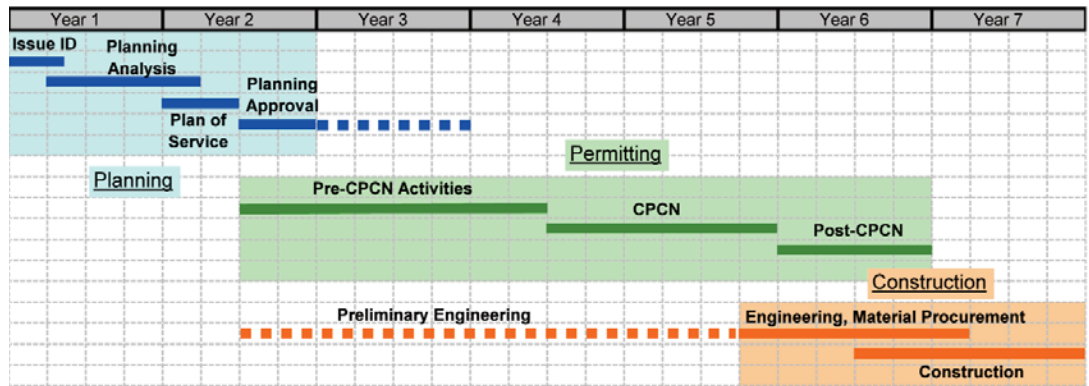
Many utilities and transmission operators establish interconnection procedures that are modeled on FERC standardized (*pro forma*) procedures. In general, an interconnection request must identify the type of interconnection service requested (network or energy only), describe the location, output and equipment of the facility, provide detailed technical information, include a cash deposit, and establish control of the project site. After the request, the generator must agree to pay for a series of technical studies. Additional deposits will be required for phases of these studies. The final study (the facilities study) will estimate the costs of the upgrades, the schedule to perform the upgrades, and equipment necessary for the interconnection. Subsequent agreements will address construction and operating responsibilities. An explanation of the boxes in *Figure 1* is included in Appendix F.

Transmission providers evaluate interconnection requests based upon a queue of requestors, with



requests reviewed in the order received. FERC requires standardized interconnection procedures for small (20 MW and under) and large (greater than 20 MW) generators. The queues¹² identify the date of the request, electrical output, general location, interconnection point, requested in-service date, type of interconnection service, the status of the request, and the technical studies that are available. The identity of the requestor is not disclosed.

Generic Schedule for a Major Electric Transmission Project



Notes

1. This provides a general timeline. This timeline of activities can be generally applied to projects 30 to 150 miles in length, involves more than 3 local jurisdictions, 2 to 3 federal agencies, 1 to 3 state agencies, and more than 30 land owners. The planning process is a key uncertainty.
2. This timeline assumes a certificate of public convenience and necessity (CPCN) is needed.
3. Issue Identification: The transmission project may be needed for reliability, economic reasons, and/or for renewable resources.
4. Planning Approval: Please see CAISO generator interconnection process and Order 890 planning process.
5. Pre-CPCN Activities include (a) project scope definition, (b) project study area definition, (c) environmental information identification and compilation, (d) informational exchange with community leaders, (e) consultation with land use and natural resource management stakeholders, (f) preparation of Proponent's Environmental Assessment, and (g) preparation and filing of permit application.
6. CPCN Process: Please see CPUC timeline. Actual schedule depends on, among other things, (a) environmental setting and potential impacts, (b) project complexity, and (c) level of public interest.
7. Post-CPCN activities include right-of-way acquisition and resource agency permits acquisition. Additional time will be needed if eminent domain action is necessary.

Figure 2 – Generic Schedule for a Major Transmission Project

Identification of Market

One of the key decisions to be made by a renewable developer is identifying the market or markets of greatest interest. This decision will drive many of the significant processes that follow. The most geographically proximate transmission line to the proposed project site might be unsuitable for the transmission of the energy to the desired market for many reasons, including:

- lack of available transmission capacity,
- inappropriate voltage levels for the project size, or
- uneconomic costs of transmitting the energy to the purchaser over multiple transmission systems due to additional wheeling costs (the cost paid to the owner of the transmission line) as a result of "pancaked" rates (multiple surcharges on transmission rates crossing several service territories).¹³

Key Permitting Considerations in the Western U.S.

The Federal government owns almost 30 percent of the land in the United States, and an even greater percentage in the West.¹⁴ The five states with the largest acreages of federally owned land¹⁵ are California, Arizona, New Mexico, Utah and Nevada¹⁶. Federal land ownership in the WGA region is significant, and thus development of renewable projects and infrastructure has the potential to include required land use authorizations (i.e. leases and rights of way) from federal agencies.

In addition to federal lands, tribal lands also comprise a significant portion of land in the west. Development of projects on tribal lands will require tribal authorizations and in some cases federal authorizations as well. Many of the states in the West control “School” or “Trust Lands” that were designated as such by Congress in establishing territories and states. Such lands are held in trust by the states for the benefit of identified beneficiaries such as schools, universities or other public institutions. Because of the extent of these holdings in the West, the development of renewable energy projects and infrastructure may require state land use authorizations as well.¹⁷

Major Federal Environmental Laws Affecting Developers

- **National Environmental Policy Act (NEPA)**¹⁸ - Federal agencies are required to examine the environmental consequences of significant federal actions, such as grants of rights of way; conduct scoping to determine the nature and extent of the study; disclose environmental impacts; consider alternatives to the requested action; and identify mitigation measures¹⁹. Federal agencies issue regulations, handbooks²⁰ and guidance²¹ regarding each agency’s approach to NEPA compliance.
- **Endangered Species Act**²² (ESA) - The purpose of this law is to protect threatened and endangered species. The Fish and Wildlife Service (FWS) issues lists of species that are endangered (the species is in danger of extinction through all or a significant portion of its range), threatened (the species is likely to become endangered within the foreseeable future), or are classified as “candidate species” (species for which the FWS has enough information to propose listing, but is precluded from doing so by higher listing priorities). Section 7 of the ESA requires federal agencies to consult with the FWS, which can issue a biological opinion or concurrence letter to the federal agency regarding that agency’s proposed action.²³ Section 9 of the ESA prohibits the “take” of a threatened or endangered species. “Take” is defined broadly and includes actions that may harm a listed species, its habitat, or impair essential behavioral patterns. Section 10 of the ESA provides for the issuance of permits for the incidental take of a threatened or endangered species. In a situation where a Section 7 consultation is not required, a developer may need to obtain an “Incidental Take Permit” under Section 10 of the ESA.
- **National Historic Preservation Act**²⁴ - The purpose of this law is for the federal government to provide leadership, contribute to, and encourage preservation of historic and prehistoric resources. Section 106 of the Act requires federal agencies to consider the effects of actions on historic properties and to provide for consultation with the Advisory Council on Historic Preservation (or its designees)²⁵. A State Historic Preservation Office (SHPO) is the typical designee. This is known as a Section 106 consultation.
- **Clean Water Act (CWA)**²⁶ (Sections 401, 402 and 404) - The Clean Water Act regulates the discharge of pollutants into waters of the United States²⁷. Section 402 created the National Pollutant Discharge Elimination System (NPDES) permit program that regulates point source discharges such as storm water. Section 404 of the CWA Regulates “dredge and fill” activities and is jointly regulated²⁸ by the United States Environmental Protection Agency (EPA) and the U. S. Army Corps of Engineers²⁹. Section 401 of the CWA requires states to issue water quality certifications prior to the issuance of a federal 402 or 404 permit.
- **Clean Air Act**³⁰ - The purpose of this law is to protect and improve air quality. The EPA (or state or county DEQs if so authorized) will require permits for certain emissions associated with any development activities, including construction activities such as diesel generators, as well as dust dispersal.
- **Federal Land Policy and Management Act of 1976**³¹ - The purpose of this law is to establish public land policy and to establish guidelines for its administration to provide for the management, protection,



development, and enhancement of the public lands. Federal agency management plans must either include renewable energy or transmission corridors, or be amended to permit such corridors before the agency may issue a “Record of Decision” granting rights-of-ways or other land use approvals.

- **Migratory Bird Treaty Act of 1918**³² - The Act implements certain international treaties and conventions for the protection of migratory birds. It is unlawful to take, kill, or possess migratory birds. Projects can be reviewed for compliance with the Act’s provisions, triggering a NEPA evaluation for a project which otherwise might not be required.
- **Department of Defense (DOD)**³³ - In testimony before the U.S. Senate Committee on Natural Resources, DOD recently identified three areas of conflict relating to renewable energy projects potentially impacting DOD lands. First, siting of large-scale renewable energy projects on or near military installations may not be compatible with the current or projected mission of the installation, citing concerns with wind, or solar facilities interference with navigation/radar equipment. Second, military installations are home to threatened and endangered species and the implementation of mitigation measures could burden the department; third competition for water use³⁴. In addition, the military may have no-fly zones related to training flights that may extend well beyond the boundaries of any military installation.
- **Federal Aviation Agency (FAA)**³⁵ - The FAA will evaluate whether a particular project will affect air navigation and issue a finding of hazard or no hazard to aviation navigation. Any person who proposes to construct any facility of more than 200 feet above ground level (there are other triggering proposed actions) must notify the FAA and will be required to submit an application and submit the proposed project for review³⁶.

Permits and Studies Potentially Required for a Renewable Energy Project

Utility infrastructure, like other industrial facilities, modifies the landscape and impacts the human and natural environment. Accordingly, federal, state and local agencies and governments will evaluate and authorize proposed activities and facilities for compliance with environmental, safety, public health, and social values. The geographic location of the proposed infrastructure determines which agencies will have jurisdiction. Permit requirements vary depending on whether the land is privately, state, or federally owned. There are numerous online geographic information systems (GIS) which can be used to identify jurisdictional boundaries within the footprint of the proposed infrastructure. A developer should use such tools (and qualified advisors) to assess the applicability of possible permits to the proposed project.

A thorough assessment of necessary permits at the outset of the development process will avoid inefficiency. States have also provided guidance regarding renewable energy project development. The California Energy Commission (CEC), California Department of Fish and Game, Bureau of Land Management, and the U.S. Fish and Wildlife Service collaborated to produce a September 2009 draft staff report³⁷ entitled “Interim Guidance for Desert Renewable Energy Project Development.”³⁸ While focusing on the development of renewable projects in California, the draft report discusses in detail agencies to contact, development activities that will be required in most states, and the sequencing of these activities. Any renewable developer looking for a project checklist should review this comprehensive but concise description of the development process.

Most permitting processes, federal, state, and local can be reduced to three major steps:

1. Preparation of the application and submission of required data to the relevant agency.
2. Agency acquisition and review of data, which can include iterative exchanges of information.
3. Agency final review and issuance/approval of the permit.

Following is a list of **potential permits** and approvals required for a renewable energy project:

Local Agency or Jurisdiction Permits

- Rezoning of the project site or special use permit
- Site plan approvals
- Drainage plan and construction plan approvals (dust control plans)
- Building permits and inspections
- Fire control and suppression plan approvals and hazardous materials storage and control plans
- Traffic impact studies (permits for access to local roadways and state highways)
- Plan approvals and permits for water supply systems and waste water systems
- Business licenses

Environmental

- NEPA study and Record of Decision (ROD) by federal agency granting lease or rights of way and required mitigation measures (amendment of existing land management plans)
- Endangered Species Act review/study
- Section 402 Clean Water Act (NPDES) discharge permit/pollution prevention plan
- Section 404 Clean Water Act discharge permit/study
- Cultural resources/archaeological studies/consultation with a with state historic preservation office and/or Native American tribe or nation
- Noise emissions/interference with communication signals study
- Air emissions permit for construction activities (including dust emissions) and generators (federal, state or local DEQ)
- Water supply verifications and approvals for water use
- Flood control approvals
- Consultations with state departments for game and fish or natural resources - amendment of existing land management plans

Regulatory Approvals Which May Require Environmental Information, Studies and Analysis

- Authorizations from state siting authorities regarding the environmental compatibility of the project and approving its specific location facilities allowed, and required mitigation measures
- State land department leases or rights of way (precursor environmental studies and survey information vary from state to state)
- Approval by public utility commission or other body regarding the need for the project or a certificate of convenience and necessity

Projects Using Federal Lands

A project which requires federal action will³⁹ trigger NEPA compliance. The NEPA process may require public “scoping,” which will provide stakeholders, including agencies, individuals, and organizations, the opportunity to comment. These comments will be used to identify the scope and content of the required NEPA document. It is not uncommon for a NEPA study to include a “plan of development” for construction, operations, maintenance, and access to the project facilities.

Depending upon the issues identified, the studies required could take up to a year or longer to complete. Iterative drafts of the NEPA document will be circulated for months among cooperating agencies before a final draft is issued for public comment. These comments are then reviewed and addressed in the final document. The compilation of the public comments and assessment process will require additional months.

After the final NEPA document is issued, the developer will complete the application process for the “federal action” desired (such as granting a right-of-way), will identify the mitigation measures required, and establish a project schedule for the implementation of the mitigation measures. The federal action application process and mitigation scheduling can require a few more months. Approval of the federal application



allows the energy producer to begin project construction.

There are federal permits that could be required in addition to NEPA compliance, including water discharge and air permits. Some of these federal permits could require public notice and outreach to stakeholders, technical studies, and review by staff. These processes can take up to a year or more and might be pursued contemporaneously with any required NEPA studies.

Projects Using State Land

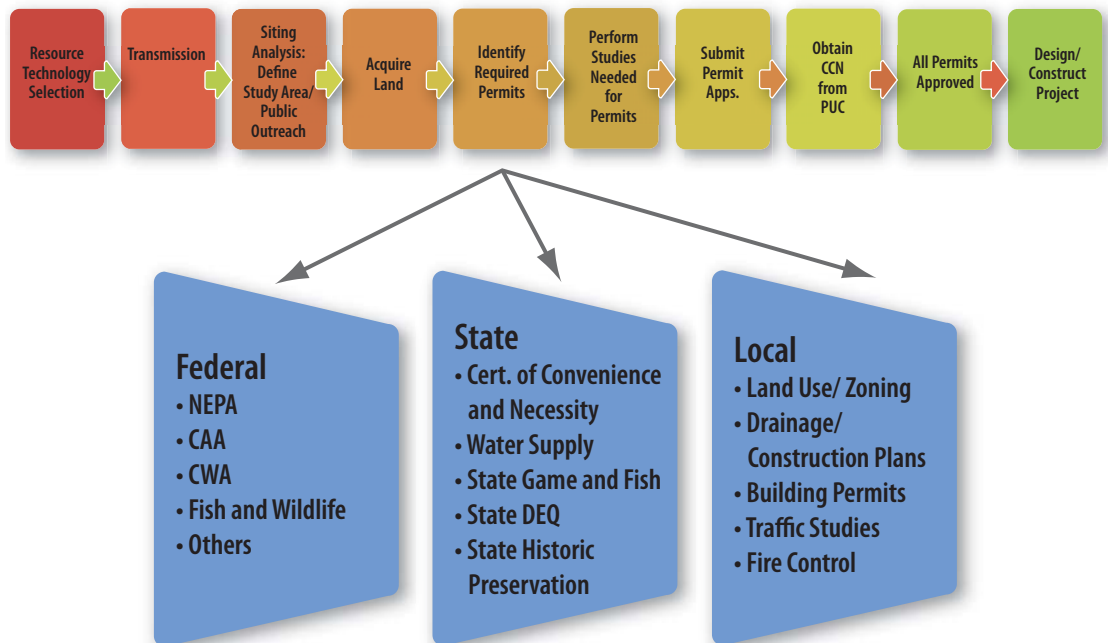
If the project site will require leases or rights-of-way on state land, the developer may be required to provide or pay for studies to assess the environmental and economic impacts of the proposed use on the state land. The developer may be required to identify a legally described and surveyed location. The developer must synchronize the identification of a specific route with the state siting process to ensure the specific route and land identified has been authorized for use by the state siting authorities.

Biological, cultural resource and appraisal reports may be required before the application for land use is deemed complete. Some of these reports might be based upon studies performed in connection with NEPA studies. Ordering and completing the survey and legal descriptions and studies could take 12 to 18 months or longer. Agency review and final approval of the application and studies will require additional time, and formal acquisition processes for auction of the requested land could be held only periodically, which would require additional time.

State Siting Processes

State siting processes vary greatly, depending upon the jurisdiction. A developer should identify the environmental studies, community outreach, and other information that will be required for these processes, and compare them to what will be required by NEPA processes in order to analyze potential efficiencies and opportunities for synchronization.

Development Process



Keys for a Successful Project

The complexity of permitting and licensing processes and the need for coordination, synchronicity, and efficiency has been the subject of Congressional review,⁴⁰ and study,⁴¹ and federal agency⁴² attention. Bills have been introduced at federal and state levels; workshops have been convened by state public utility commissions, utilities, environmental groups and industry organizations; and policy papers and legal articles have been published, all on the topic of streamlining processes that are inherently complicated by the interactions among multiple entities with jurisdiction over components of the overall development process.

Well planned projects *can* achieve licensing and permitting on schedule and on budget. Project planning is essential. This will include fatal-flaw and critical-path analyses which should be prepared at the outset, and updated regularly. Success of a project relies on coordinated efforts by various entities that must review projects and assess impacts. An early identification of which agencies are involved, what their requirements are, what actions must precede other actions and estimates of time lines for these actions based upon investigations of similar projects will minimize frustration and expense. Environmental and engineering consultants can provide a developer with a project schedule, consisting of a “permit list” that is project-specific and includes consideration of developer-provided milestones for completion of certain tasks or the issuance of necessary permits.

Key Steps: Communicate, Communicate, Communicate

- A developer should have preliminary meetings with key regulatory agencies to identify permits required and to provide information regarding the project.
- Project developers should be involved in regional planning processes that provide an evaluation of the project by utilities, transmission owners, environmental agencies, and regulators. Such preliminary reviews greatly facilitate project feasibility analyses.
- Developers should engage in preliminary dialogues with the environmental community early during the project planning process, before the start of any formal study process. This will provide a developer with important information regarding potential environmental problems that could be eliminated by modifications to the project scope or location. Avoidance of environmental issues can be more time and cost effective than identifying and then implementing mitigation measures. Alternative route options provide a way to avoid sensitive biological and cultural resource issues and can be considered a primary environmental mitigation measure. Developers should be willing to make changes to the project plan when it is reasonable and feasible to do so. If mitigation measures are proposed it may be necessary to establish methods to evaluate their effectiveness.
- An early public/stakeholder/community/landowner outreach process will also provide the developer with information regarding key issues of concern, which may not be self evident or obvious, but are nonetheless powerful drivers of the content and timing of environmental permitting and licensing processes. Effective components of this outreach process could include Web sites, newsletters, open houses, community leader forums, and a system for tracking comments. Early outreach and identification of community concerns may avoid costly delays due to community opposition.

Conclusion

Obtaining permits for renewable energy and transmission can be a complex and time consuming process. There are a myriad of federal, state and local requirements to navigate. While this document could not possibly cover every situation in every state or county, it provides those considering projects with a reasonably comprehensive view of the steps and possible organizations involved.



Notes

¹ See Energy and Transmission Initiative web link at:

http://www.westgov.org/index.php?option=com_content&view=article&id=129&Itemid=57

² See WIEB at: <http://www.westgov.org/wieb/>

³ Detailed information regarding the award at:

http://www.westgov.org/index.php?option=com_content&view=article&id=129&Itemid=57

⁴ <http://www.westconnect.com/filestorage/Transmission%20Roadmap%20request.pdf>

⁵ "There is broad agreement that the Western U.S. must act now to ensure it will have a diverse supply of secure, environmentally responsible and affordable energy well in the future. By acting now, we will be able to continue our economic progress, protect our outstanding quality of life and harness our abundant domestic energy resources." Clean and Diversified Energy Committee Report to the Western Governors June 2006

http://www.westgov.org/index.php?option=com_content&view=article&id=129&Itemid=57

⁶ Holtkamp, James A. and Davidson, Mark A. Transmission Siting in the Western United States: Overview and Recommendations Prepared as Information for Western Interstate Energy Board. Holland & Hart, August 2009.

⁷ 16 USC §824-824m

⁸ This is because of the physics of electricity. Any electricity which enters the grid immediately energizes the entire grid, (the Western Interconnection) which is an interstate network.

⁹ For example, public power entities may not be regulated by FERC for some purposes. This roadmap assumes a utility which is regulated by FERC.

¹⁰ Speaking very generally, an integrated resource plan is an evaluation of the: anticipated electrical load demand; applicable rules and regulations; technical requirements; financial considerations; and generation technologies and an identification of goals and objectives for the acquisition of the necessary electricity.

¹¹ In FERC Order 2004 FERC required that regulated utilities must operate their transmission functions independent from market functions and prohibits passing of information between the two functions. See

<http://www.ferc.gov/enforcement/stand-conduct.asp> and orders cited therein.

¹² The appendix contains links to websites which contain the transmission providers' queues.

¹³ A developer must not only pay for the costs of network upgrades and the infrastructure needed to connect the project to the grid, he must also pay for the transmission of the energy. The developer must not only request interconnection with a transmission provider he must also request transmission service, which is a separate process. The cost of transmission service will vary, depending up the nature of the service provided; long term firm, short term firm and non firm. In order to deliver the electric energy to the purchaser, the use of two or more transmission systems may be necessary. Each transmission provider will charge, pursuant to its tariffs (rates) for the transmission service necessary to "wheel" the power across its system. This combination of charges is referred to as "pancaking". The utilities' rates or tariffs will typically be posted on the utilities' Open Access Transmission Tariff (OATT) web page.

¹⁴ <http://www.nationalatlas.gov/printable/fedlands.html>

¹⁵ Excluding National Parks, National Forests, National Wildlife Refuges, Trust lands and lands withdrawn for military purposes. For a real property inventory of Dept of Defense lands see:

<http://www.acq.osd.mil/ie/download/bsr/BSR2009Baseline.pdf>

¹⁶ http://www.gsa.gov/graphics/ogp/FY_2008_Real_Property_Report.pdf

¹⁷ Links to many State land Departments/ Boards/Commissions/Agencies and their permitting procedure are in Appendix B.

¹⁸ Text at Council of Environmental Quality website at <http://ceq.hss.doe.gov/nepa/regs/nepa/nepaeqia.htm>

¹⁹ For overviews of NEPA see: <http://ceq.hss.doe.gov/nepa/regs/nepa/nepaeqia.htm> and NEPA net page at: <http://ceq.hss.doe.gov/nepa/nepanet.htm>

²⁰ NEPA Handbook June 2008. Bureau of Land Management:

http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.84688.File.dat/h1790-1-2008.pdf NEPA Handbook USFWS: <http://www.fws.gov/r9esnepa/TOCnotebook.pdf> and

- ²¹ NEPA Procedures and Guidance. USFS.: http://www.fs.fed.us/emc/nepa/nepa_procedures/index.htm
- ²² US FWS ESA page: <http://www.fws.gov/endangered/whatwedo.html>
- ²³ ESA Basics US FWS: http://www.fws.gov/endangered/factsheets/ESA_basics.pdf
- ²⁴ Text of law at: <http://www.achp.gov/nhpa.html> Advisory Council on Historic Preservation: <http://www.achp.gov/nhpp.html> (contains links to state (<http://www.ncshpo.org/find/index.htm>) and tribal (<http://www.nps.gov/history/hps/tribal/thpo.htm>) preservation officers)
- ²⁵ <http://www.achp.gov/docs/Section106FactSheet.pdf>
- ²⁶ US EPA Clean Water Act page: <http://www.epa.gov/lawsregs/laws/cwa.html>
- ²⁷ "Waters of the United States is a term which is defined in statute and further refined by United States Supreme Court Opinion .For a detailed analysis see: <http://www.epa.gov/wetlands/guidance/CWAwaters.html>
- ²⁸ Summaries of Section 404 program at http://www.epa.gov/owow/wetlands/pdf/reg_authority.pdf
- ²⁹ US Army Corps of Engineers: <http://www.usace.army.mil/about/Pages/Home.aspx>
- ³⁰ US EPA web page for Clean Air Act: <http://www.epa.gov/air/caa/>
- ³¹ 43 USC Chapter 35 <http://frwebgate.access.gpo.gov/cgi-bin/usc.cgi?ACTION=BROWSE&TITLE=43USCC35&PDFS=YES>
- ³² 16 U.S.C §§ 703- 712
- ³³ Department of Defense Environment, Safety and Occupational Health Network and Information Exchange <https://www.denix.osd.mil/portal/page/portal/denix>
- ³⁴ May 20, 2010 Testimony of Dr. Dorothy Robyn Deputy Under Secretary of Defense http://energy.senate.gov/public/_files/Robyntestimony052010.pdf
- ³⁵ <http://www.faa.gov/>
- ³⁶ Code of Federal Regulations Title 14 Part 77 Objects Affecting Navigable Air Space.
- ³⁷ CEC-700-2009-015-SD
- ³⁸ <http://www.energy.ca.gov/2009publications/CEC-700-2009-015/CEC-700-2009-015-SD.PDF>
- ³⁹ Federal agency implementing regulations may define categories of projects which will require specific environmental studies and which will be categorically exempt. DOE: http://nepa.energy.gov/DOE_NEPA_documents.htm
- ⁴⁰ The House Subcommittee on Energy and Mineral Resources and the House Subcommittee on Water and Power held a joint oversight hearing November 5, 2009 on "Getting Past Gridlock: Models for Renewable Energy Siting and Transmission". Useful presentation materials relevant to this topic from the Bureau of Land Management, regulators, environmental groups, utilities, business groups and WGA officers, are posted at: http://resourcescommittee.house.gov/index.php?option=com_jcalpro&Itemid=27&extmode=view&extid=304
- ⁴¹ Luther, Linda. The National Environmental Policy Act: Streamlining NEPA. Congressional Research Service, Report No. RL 33267, December 2007 : http://assets.opencrs.com/rpts/RL33267_20071206.pdf
- ⁴² In October, 2009 Nine federal agencies established a MOU regarding coordination in federal agency review of electric transmission facilities on federal land for projects of high voltage transmission lines which cross jurisdictions administered by more than one federal agency. See: <http://www.whitehouse.gov/files/documents/ceq/Transmission%20Siting%20on%20Federal%20Lands%20MOU.pdf>



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