



U.S. Department of Energy

OAK RIDGE NATIONAL LABORATORY

CHP Subcontractors Coordination Review Meeting



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Energetics, Inc.
901 D St, SW
Washington DC

Name of Contract and Subcontractors

A Review Of Distributed Generation Siting Procedures



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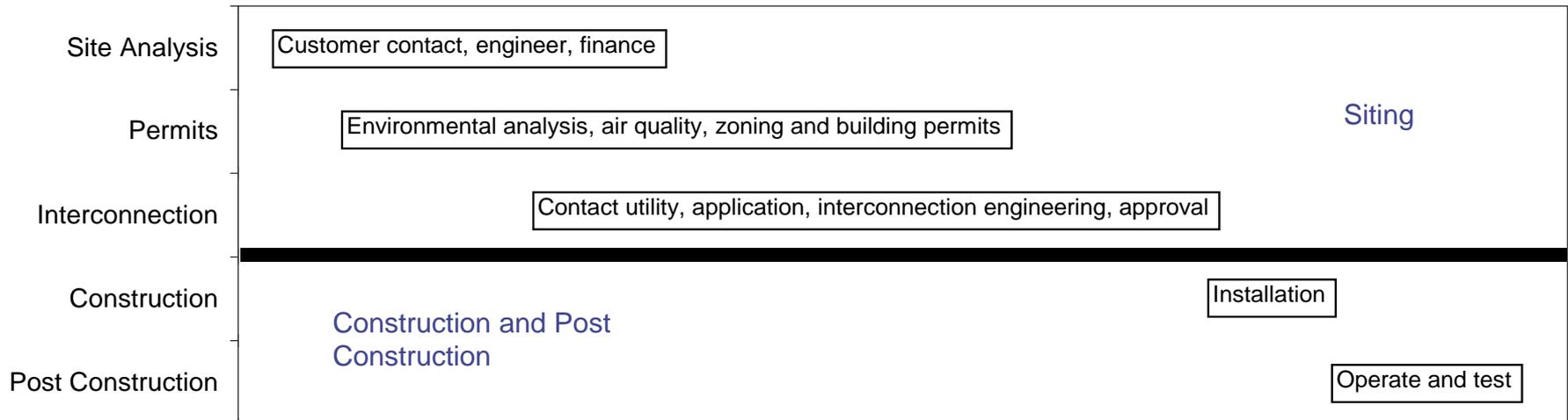
Description of Task(s)

- Objectives
 - Evaluate the distributed generation siting process, and identify ways to improve the processes that could result in reductions in cost and time
 - Help developers understand siting and permitting costs and siting project duration
- Approach
 - Task 1. Collect baseline siting data
 - Task 2. Perform siting trends analyses
 - Task 3. Analyze siting procedures and make recommendations

Description of Progress Against Task(s)

Task 1: Collect Baseline Siting Data

Project Timeline



Description of Progress Against Task(s)

DG Continues to be Sited (MW Installed 2000-2003)

Size Category	< 1 MW	1-5 MW	5-30 MW	30-60 MW	All Sizes
Combined Cycle		10	40	40	90
Combustion Turbine	70	70	3,900	850	4,900
Fuel Cell	50				50
Hydropower		4			4
Reciprocating Engine	3,920	2,800	240	40	7,000
Steam Turbine		30	160	100	300
Total MW Capacity	4,040	2,900	4,380	1,030	12,400

Sources: Energy Information Administration Form 860, *Diesel and Gas Turbine Worldwide* annual surveys, U.S. Bureau of the *Census Current Industrial Reports*, and Resource Dynamics Corporation data

- Nearly all were reciprocating engines or combustion turbines
- Among interconnected applications, most was used for CHP
- Among units greater than 1 MW in size, nearly half of the capacity was concentrated in five leading states adopting DG rules and regulations: CA, OH, TX, IL and NY

Description of Progress Against Task(s)

Equipment and Siting Unit Costs (2002 \$ per kW)

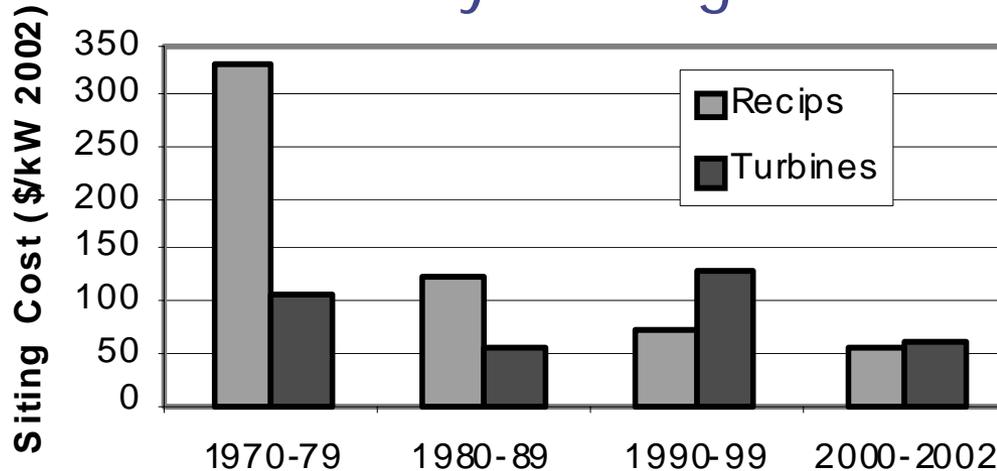
Technology	Application	Cost (\$/kW, 2002\$)		
		Equipment	Siting	Total
Reciprocating	Baseload	740	120	860
Engine	Peaking	540	110	650
Combustion	Baseload	930	80	1,010
Turbine	Peaking	520	60	580

Source: Energy Information Administration Form 412, 2002. Units over \$2,000/kW and under \$100/kW equipment cost were deemed unreliable and removed from the analysis.

- In comparison, DOE cost estimates called for siting costs to be from \$170 – 410 per kW, or 2-3 times higher (DOE Technology Characterizations)
- Key differences in siting costs between regulated entities and those incurred by DG developers include:
 - Siting the unit on new land or in a new building, whereas utilities commonly locate new generators at an existing plant or a substation, and
 - Obtaining approval for interconnection, thus siting costs may be higher since the developer cannot site units where they make most sense to the utility.

Description of Progress Against Task(s)

Task 2: Analyze Siting Trends



- From 1980-2002, siting costs for muni applications have been between \$50-125 per kW, and generally have constituted about 10-20 percent of total installed cost.
- DOE estimates for independently sited units put siting between 25-35 percent of total installed cost, and anecdotal evidence suggests that they could be as high as 50 percent.
- Much of the early drop for reciprocating engines can be attributed to better DG packages, which were a major focus of reciprocating engine vendors in the late 1970s and early 1980s

Description of Progress Against Task(s)

Task 3. Analyze Siting Procedures & Make Recommendations

- Examine ways to mitigate siting and permitting costs.
- Carefully examine what has and is happening in the leading states
 - Those that have adopted DG interconnection and siting rules, or have large siting levels
 - Includes NY, TX, CA
 - May include IL, NJ, OH, MA, WI, MI
- Consider requesting EIA 412 unregulated entity Schedule 9 data.
- Prepare draft report.
- Conduct external reviews of draft report.

Description of Progress Against Task(s)

A review of current policies in the leading DG states indicated that best practices include:

- Clear and reasonable interconnection policies,
- Air emission rules that specifically address DG and CHP issues,
- Implementation of DG pre-certification programs,
- Economic incentive and net metering programs for DG and renewables,
- Publication of documents that help developers navigate the permitting or regulatory process.

Description of Progress Against Task(s)

Recommendations for state and local regulators to improve DG siting are:

- Reducing permit and interconnection time
- Mandating statewide utility business terms
- Standardizing and streamlining the interconnection process, consistent with IEEE 1547
- Considering the value of CHP thermal output and the DG state of the art in state air emission requirements
- Providing incentive programs that give an early push toward market adoption of new DG technologies and energy-efficient technologies such as CHP

Description of Progress Against Task(s)

Four siting principles to guide DG developers and customers in reducing siting costs and time are:

1. Careful up front planning will avoid unnecessary risks.
 - Complete feasibility analysis prior to investing in fees and permits.
 - Concurrently seek financing, permits and interconnection approval to reduce siting time and costs.
 - Contact permitting and utility officials early, often, and draw upon their expertise to solve specific project challenges.
2. Developers should budget for interconnection uncertainty, and try to get resolution on these issues as early as possible.
3. To reduce costs, developers should consider DG equipment that has met pre-certified standards in states where this applies.
4. Make use of existing government and utility provided siting tools.

FY04-05 Timeline

- Draft Report Completed March 2005
- Review Underway
- Final Report Scheduled for April 2005

FY04-05 Deliverables and Availability

<u>Deliverable</u>	<u>Status</u>
Task 1 Status Report	Completed
Task 1 Draft Report	Completed
Task 2 Status Report	Completed
Task 2 Draft Report	Completed
Task 3 Status Report	Completed
Task 3 Draft Report	Completed
Draft/Final Report/PPT	Draft Completed/Final Report and PPT Planned April 05

- All deliverables will be available in PDF format for both hard copy and electronic delivery

Coordination with Stakeholder Groups and Other Project Teams

- Stakeholders Key Part of Project Inputs
- Draft Report Review Involved Stakeholders from Utility, DER Manufacturer, National Lab, and IEEE Representation

Questions?

