



PROJECT SUMMARY

DISTRIBUTED GENERATION AND RENEWABLE ENERGY MARKET STUDY

PROJECT SUMMARY

The purpose of this distributed generation and renewable energy market study was to identify and rank a number of selected utility regions within the US based on the “developability” of small and medium scale distributed generation and renewable energy generation. The client, an independent power plant developer and unregulated utility subsidiary wanted this study so they could use the results to focus their marketing and business development in the utility territories where each type and size of technology ranked highest. Factors considered in the ranking process included a wide range of criteria for development including resource availability, regulatory environment, costs, utility environment, constructability, local and regional incentives, renewable energy credits, etc. These criteria were given a weighting and that weighting and the score used to identify in which utility territories each type of project would be best. The types of projects included Emergency and Stand-by Power, Stand-by and Load Curtailment Power, Peak Shaving, Primary Power, Cogeneration (CHP), Solar Power, and Wind Power.

PROJECT STATISTICS

Client:	A major Independent Power Developer (Unregulated Utility Subsidiary)
Project Type:	Detailed distributed generation and renewable energy market study
Generation Project Types:	Emergency and Stand-by Power; Stand-by and Load Curtailment Power; Peak Shaving; Primary Power; Cogeneration (CHP); Solar Power; and Wind Power.
Equipment Types:	Reciprocating Engines, CTs, micro-turbines, solar pv and wind turbines (small scale).
Plant Sizes:	DG: various; Renewable: 50 – 250 kW; 250 – 1,000 kW; > 1,000 kW
Total Utility Areas:	10 major utilities
Utility Locations:	Throughout the United States

PROJECT DESCRIPTION

Bridgestone Associates was engaged by the client, a major independent power producer and unregulated utility subsidiary, to develop and implement a process by which they could identify target market areas for the development of small and medium sized independent power plants, including distributed generation and renewable energy projects. Ten large utility areas were selected by the client as areas in which they were planning to do business development. These included

Commonwealth Edison (Illinois), Nevada Power (Nevada), Virginia Power (Virginia), SCE and PG&E (California), PECO (Pennsylvania), Consolidated Edison (New York); PSE&G and JCP&L (New Jersey), and FP&L (Florida). For each utility area, the commercial, institutional, and industrial rates were reviewed in detail and the rate structure, costs and specific criteria (e.g. demand ratchets, demand and energy charges, time-of-use rates, termination charges, stand-by rates, back-up and supplemental power costs, net metering allowances, and buyback rates) were identified and documented. Each of these were given a score based on how they would help or hinder the economic and technical success and the development of the following distributed generation and renewable energy projects:

- Emergency and Stand-by Power (<1,000 kW, 1,000 – 5,000 kW, >5,000 kW);
- Stand-by and Load Curtailment Power(500 – 1,500 kW, 1,500 – 5,000 kW, >5,000 kW);
- Peak Shaving (500 – 1,500 kW, 1,500 – 5,000 kW, >5,000 kW);
- Primary Power (500 – 1,500 kW, 1,500 – 5,000 kW, >5,000 kW);
- Cogeneration (CHP) (500 – 1,500 kW, 1,500 – 5,000 kW, >5,000 kW);
- Solar Power (PV) (50 – 250 kW, 250 – 1,000 kW, >1,000 kW); and,
- Wind Power (50 – 250 kW, 250 – 1,000 kW, >1,000 kW).

In addition to evaluating the utility factors related to the potential economic and technical success of each type and size of project, other factors were determined, evaluated, given a weighting, and then scored. These factors and criteria included:

- Renewable Energy Resource;
- Natural gas availability;
- Exit fees;
- Curtailment incentives;
- Renewable Energy Credit market;
- Environmental restrictions;
- Regulatory environment;
- Future generation requirements;
- Interconnection requirements and costs; and,
- Overall costs.

The result of this analysis was an overall score and percentage for each size range and type of project for each utility area. These overall scores and percentages could then be compared with other size ranges and types of project within the utility area and with those in other areas. The client was then able to identify which technologies and what size range of those technologies would be the most appropriate in each utility area and in which utility territory they would have the most chance of success in developing these projects.

The chart on the next page shows an example of the analysis results for one of the utility areas.

The project was completed by Bridgestone Associates within the agreed schedule and within the agreed budget.

BRIDGESTONE ASSOCIATES, LTD.
DISTRIBUTED AND RENEWABLE GENERATION OPPORTUNITY ANALYSIS

UTILITY REGION A

Project Developability Score	GAS OR DIESEL FIRED DISTRIBUTED GENERATION										RENEWABLE ENERGY					
	EMERGENCY OR STANDBY POWER		STANDBY + LOAD CURTALLMENT POWER		PEAK SHAVING		PRIMARY POWER		COGENERATION		SOLAR PHOTOVOLTAIC		WIND			
	Scale	<1,000 - 1,000 - 5,000 kW	Scale	500 - 1,500 - 5,000 kW	Scale	500 - 1,500 - 5,000 kW	Scale	500 - 1,500 - 5,000 kW	Scale	500 - 1,500 - 5,000 kW	Scale	50 - 250 - 1,000 kW	Scale	50 - 250 - 1,000 kW		
Negative																
Positive																
Utility Specific																
T-CU Rates	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Overall Electricity Costs	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Demand Ratchets	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Backup and Standby Rates	Low Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Backup and Standby Rates	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Curtalement Incentives	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Net Metering	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Reliability	Low Score	0.5	1	1	0.5	2	2	2	0	0.5	1	1	1	1		
Reliability	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Electric Cost to Gas Cost Ratio	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Interconnection Costs	Low Score	0-3	2	2	0-3	2	2	2	0-3	2	2	0-3	2	2		
Interconnection Costs	High Score	0-3	2	2	0-3	2	2	2	0-3	2	2	0-3	2	2		
TOTAL UTILITY SPECIFIC		3	3	3	8	8	8	8	20	18	18	15	15	15		
Location Specific																
Renewable Energy Resource	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Renewable Energy Resource	Low Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Gas Availability	High Score	0	0	0	0-3	3	3	3	0-3	3	3	0-3	3	3		
Gas Availability	Low Score	0	0	0	0-3	3	3	3	0-3	3	3	0-3	3	3		
TOTAL LOCATION SPECIFIC		0	0	0	3	3	3	3	5	5	5	4	4	4		
State or Region Specific																
Exit Fees	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Exit Fees	Low Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Curtalement Incentives	High Score	0	0	0	0-5	4	4	4	0	0	0	0	0	0		
Curtalement Incentives	Low Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
REC Market	High Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
REC Market	Low Score	0	0	0	0	0	0	0	0	0	0	0	0	0		
Environmental Restrictions	High Score	0-5	2	2	0-5	2	2	2	0-5	1	1	0-5	2	2		
Environmental Restrictions	Low Score	0	0	0	0-3	3	3	3	0-3	3	3	0-3	3	3		
Regulatory Environment	High Score	0	0	0	0-3	3	3	3	0-3	3	3	0-3	3	3		
Regulatory Environment	Low Score	0	0	0	0-3	3	3	3	0-3	3	3	0-3	3	3		
Future Generation Capacity	High Score	0-3	2	2	0-3	2	2	2	0-3	1	1	0-3	1	1		
Future Generation Capacity	Low Score	0	0	0	0-3	3	3	3	0-3	3	3	0-3	3	3		
Interconnection Rmms & Costs	High Score	0	0	0	0-3	3	3	3	0-3	3	3	0-3	3	3		
Interconnection Rmms & Costs	Low Score	0	0	0	0-3	3	3	3	0-3	3	3	0-3	3	3		
Overall Costs	High Score	0	0	0	0-3	2	2	2	0-5	4	4	0-5	4	4		
Overall Costs	Low Score	0	0	0	0-3	2	2	2	0-5	4	4	0-5	4	4		
TOTAL STATE OR REGIONAL SPECIFIC		4	4	4	16	16	16	17	17	17	18	18	18	21		
OVERALL TOTAL SCORE		7	7	7	27	27	27	42	40	40	40	45	40	38		
% OF MAXIMUM SCORE		43.8%	43.8%	43.8%	71.1%	71.1%	71.1%	66.7%	63.5%	63.5%	60.3%	64.3%	57.1%	57.1%		
% OF MAXIMUM SCORE																