

Promoting DG-CHP in New York State Industrial Sector

Joint Distributed Power and Industrial DG Quarterly Program Review

Madison, WI
July 10, 2002



Project Team

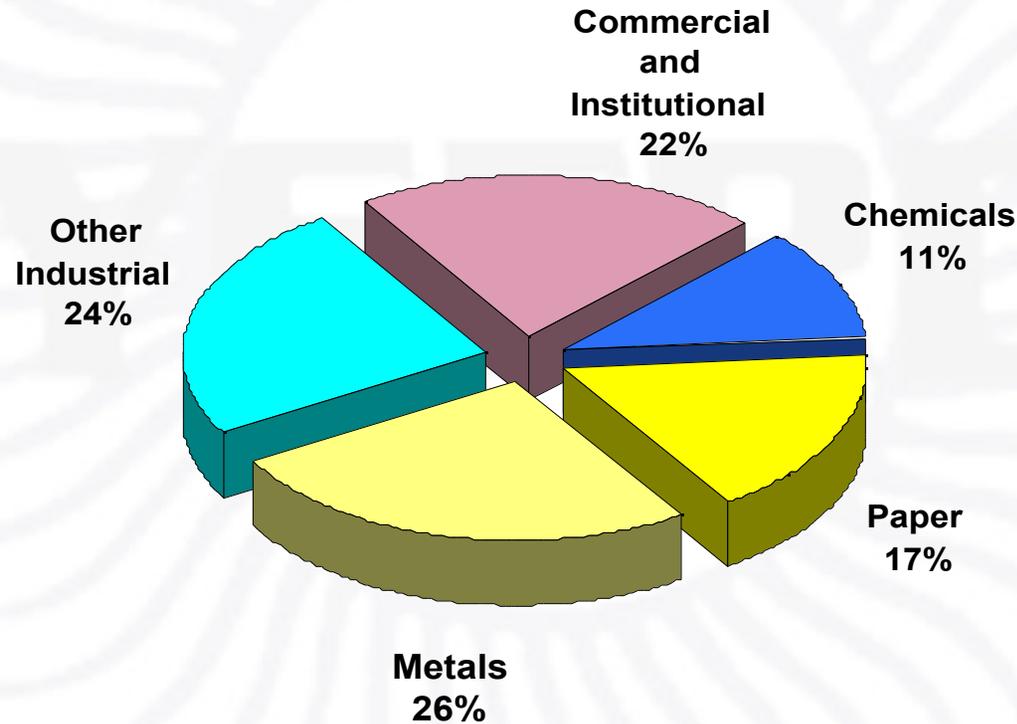
- Prime Contractor – NYSERDA
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 - Dana Levy
- Subcontractors
 - Applied GIS – Austin Fischer
 - Energy Nexus Group – Bruce Hedman
 - Pace Energy Center – Tom Bourgeois
- Technical Monitor – Oak Ridge National Lab
 - D. Tom Rizy

NYSERDA's DG-CHP Program

- Promote DG technologies and CHP applications
- Funding: \$15+ million per year
- The program supports:
 - studies to provide guidance and road mapping for further program development
 - development and demonstration projects to operate and evaluate new technologies and applications

New York's Existing CHP Capacity: 5,070 MW

Industrials Represent 78% of Existing CHP in New York



Source: Energy Nexus Group

What is the Remaining CHP Opportunity?

- 8,500 MW at 26,000 sites
- 77% is in commercial/institutional markets
- 74% is below 5 MW
- 79% is in three utility service areas
- Existing market penetration is small except in large sizes

This Study Helps Promote DG-CHP Development within New York

- Task 1 - Siting and Permitting of Smaller Systems
 - ✓ Prepare a Guidebook
- Task 2 - Finding Ideal Sites
 - ✓ Use of GIS as an Assessment Tool
- Task 3 - Valuation of Power Quality/Reliability
 - ✓ Quantifying Costs and Evaluating DG Options

Task 1 -Local Codes, Siting, & Permitting

- Objective: review existing local and regional siting and permitting process for CHP and develop a streamlined approach
- Team: NYSERDA
Pace Energy Project
Energy Nexus
- Deliverable: Guidebook for local and regional officials for DG/CHP Siting

Local Codes, Siting, & Permitting

- Codes Don't Yet Address Many Newer CHP / Cleaner DG Technologies
- Zoning Issues May Arise (“noise, aesthetics, is this a permitted use”?)
- Local Codes Officials Unfamiliar with New Technologies
- New York Initiated its DG Rule Making

Local Codes, Siting, & Permitting

- Outreach, Education & Training Programs are underway in collaboration with DOE
 - ✓ Brooklyn
 - ✓ Huntington, Long Island
 - ✓ Albany
 - Buffalo
- More than 75 people attended the Albany event, more than 60 in New York City. A database of all contacts has been compiled

Local Codes, Siting, & Permitting

- Outreach To Key Organizations including:
 - ✓ Area Chapters of NYS Building Officials Conference (Albany Chapter, Nassau-Suffolk)
 - ✓ New York City Buildings Department
 - ✓ Governor's Office of Regulatory Reform
 - ✓ New York State Planning Federation
 - ✓ New York City Economic Development Corp.
 - ✓ New York State Conference of Mayors
 - ✓ Local & Regional Planning Organizations
 - ✓ NYS Dept. of Public Service - Interconnection
 - ✓ Ombudsman for Small Business

Local Codes, Siting, & Permitting

- Identified key organizations and local officials for advisory panels
- Advisory panel meetings will commence August 2002 for New York City area
- A second advisory panel is in process of formation for upstate New York
- Expected upstate meeting by Labor Day, 2002

Local Codes, Siting, & Permitting

- Outreach Meetings and Outreach to Key Organizations and Local Officials (Ongoing)
- Active Participation in the DEC's Rule Making Process (Ongoing)
- Development of a Guidebook for Local Codes, Siting, Permitting Officials (Initiated)
- Development of Case Studies (To do)

Task 2 – CHP Location Assessment Using Geographic Information System (GIS) Technology

- Objective: Develop a GIS system to help identify effective locations for DG and CHP
- Team: NYSERDA
Applied GIS, Inc.
Pace Energy Project
- Deliverable: GIS evaluation tool



Project Objectives

- Identify geographically significant considerations for siting CHP generators
- Develop and/or acquire representative GIS data layers
- Build a GIS-based site evaluation model

Geographically Significant Considerations

- Demand for Energy / Candidate Sites
 - Based on industry type (SIC, NYS DOL data, commercial listings) / Applicants requesting CHP funding / Brownfields / Sites with industrial boilers
- Infrastructure & Support (Access to Fuel)
 - Natural gas / alternate fuel sources (e.g., landfills)
- Societal Benefits
 - Empire Development Zones / Load Pockets
- Constraints
 - Wetlands / Floodplains / Neighborhood Profiles (e.g., mainly residential)

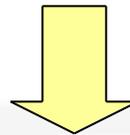
Development of GIS Data Layers

Criteria Used:

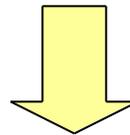
- Relevant to identified selection criteria (e.g., access to fuel)
- Commonly available both in New York State and other US states
- Reasonable level of effort required to convert into a GIS compatible format

Site Analysis Model

Candidate Sites
(point layer of potential locations)



Score Each Candidate
(based on designated geospatial analysis)



Output Ranked List



Model Features

- Based on ArcView 8.x (ArcGIS)
- Custom program written in ArcObjects
- Contains a set of geographic analysis functions
- Uses a straight-forward scoring and weighting scheme
- Multiple models can be developed, edited, and reused against different sets of candidates
- Can easily incorporate newly available data

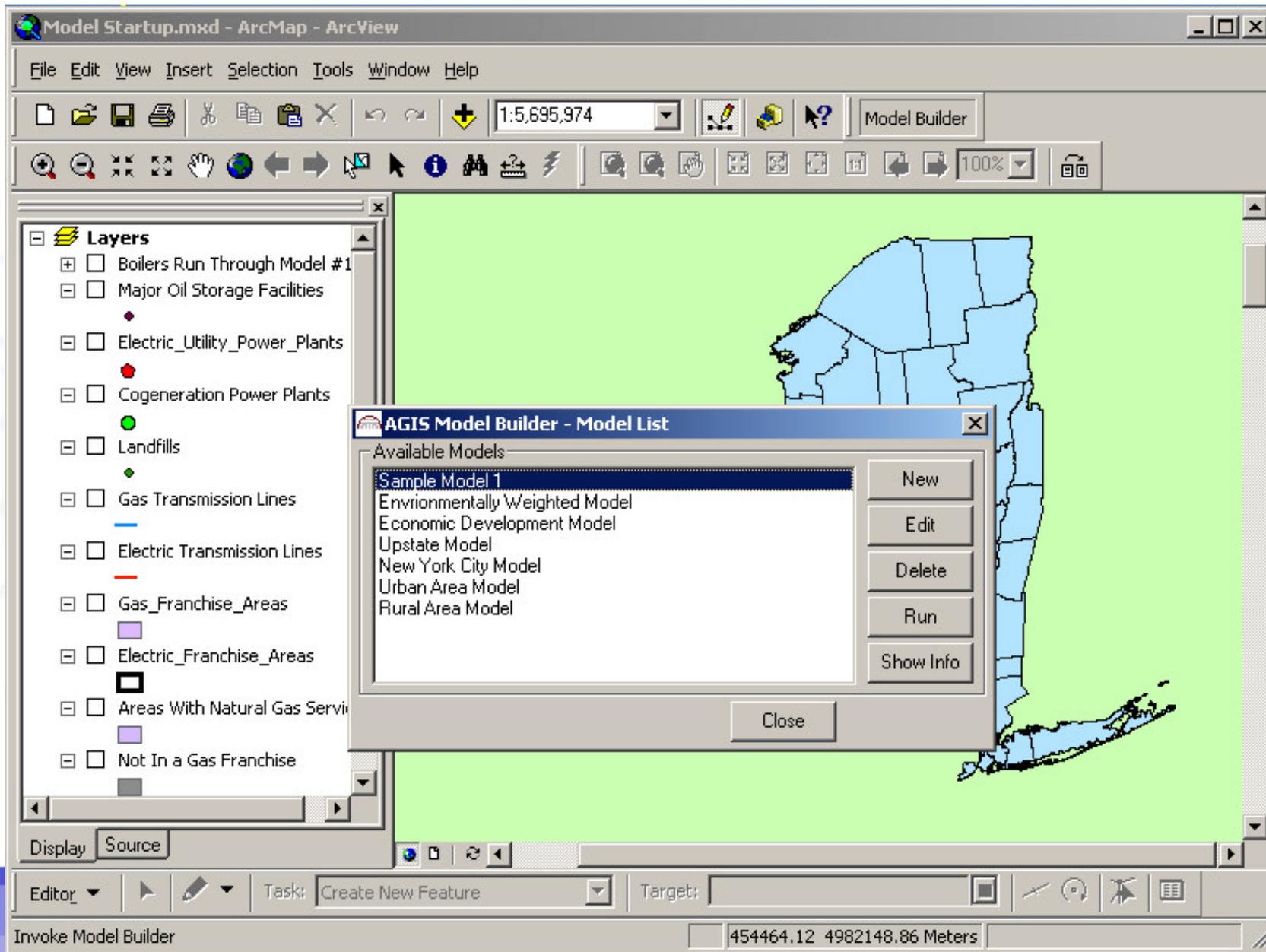


Demonstration ...





Model Builder Setup Dialog



Criteria Listing

AGIS Model Builder - Model Edit

Model Name:

Owner: Build Date:

Description:

Criteria in Model

- Within Gas Area
- Near Landfill
- In DEC Wetland
- In Load Pocket
- Outside of Gas Franchise Area
- Oil Source Nearby

New Edit Delete

Criteria Information

Analysis Function	Parameters
<input type="text"/>	None <input type="text"/>
Source Layer	Filter (optional)
<input type="text"/>	<input type="text"/>
Score Group	Weight
<input type="text"/>	<input type="text"/>

Close Save

Criteria Definition

AGIS Model Builder - Criteria Edit

Description: Within Gas Area

Notes: As indicated by 1990 census block group data.

Input Layer: BlockGroups30Plus

Layer Filter:

Output Alias: Within Gas BG

Operation: Is the Point within the Polygon?

Parameters: Is the Point within the Polygon?
Shortest Distance to Shape
Return Value Field
Number of Shapes within distance

Weight:

Scoring: In = 10, Out = 0

(True) = 10
(False) = 0

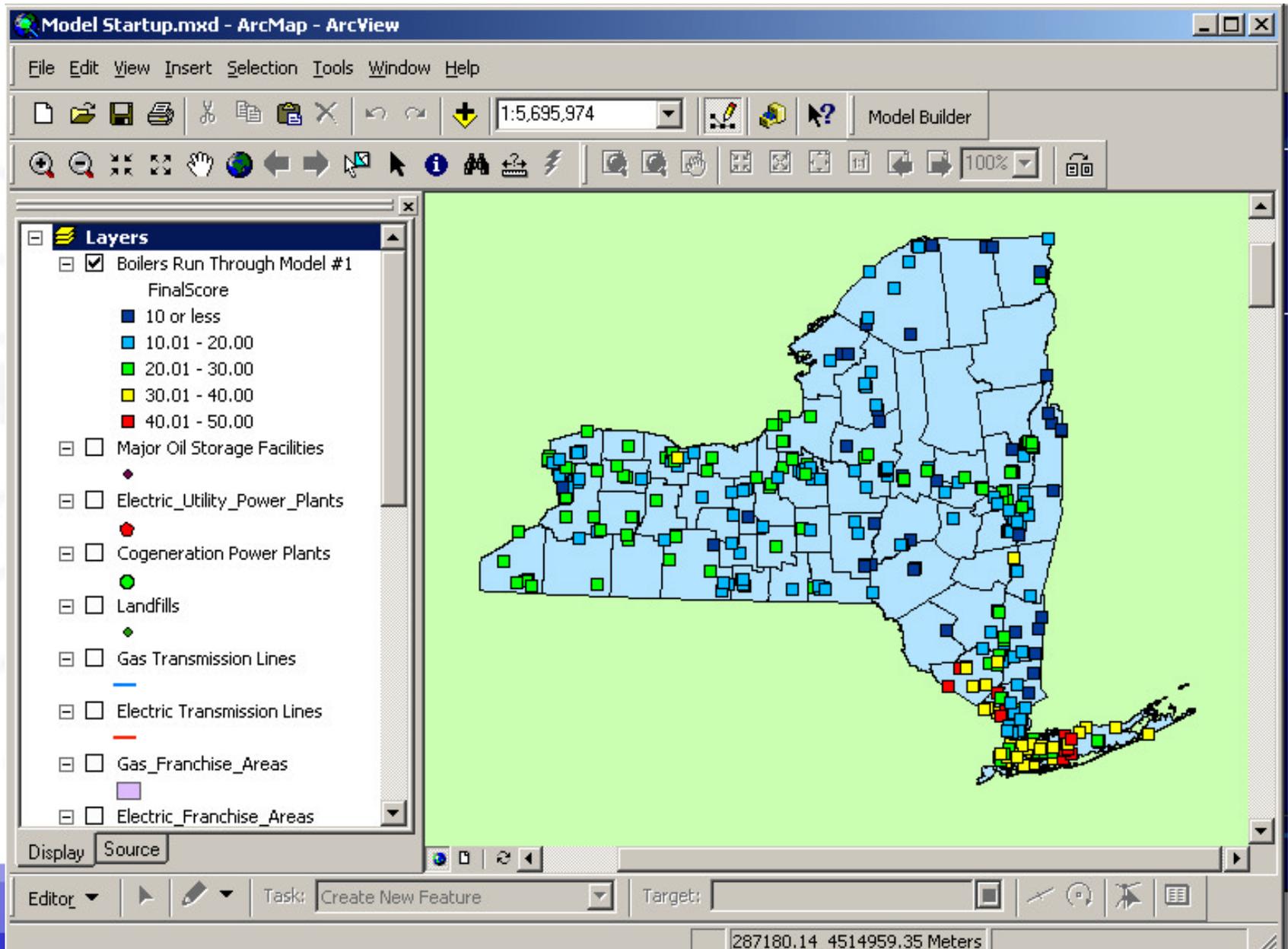
Query Builder

New Edit

Close Save



Sample Model Output



Summary

- Primary limitations are data-related (quality and availability)
- Some creative techniques can be used to overcome some of these data limitations
- Additional geographic analysis functions can be added to the model
- Geographic criteria may not be the only or most important considerations in CHP siting
- However, this tool should be of value in proactively identifying suitable CHP sites and reactively evaluating site already being considered

GIS Tool Outreach Work In Progress

- Planning a GIS Tool Workshop by mid-August 2002
- Addressed the EPA Region 2 Brownfield Pilot's Communities Quarterly Meeting on April 18th 2002
- Showcased a beta-test version of the tool at the New York State CHP Conference in New York City on June 21, 2002
- Working to integrate data from economic development tools such as Empire State Development Corporation's SITE FINDER tool, information on industrial parks, and economic development zones.
- Incorporating information from county & regional planning groups

Task 3 - Valuation of Power Quality and Reliability

- Objective: evaluate economic impact of variable power quality and service interruptions to industrial and commercial users; analyze potential DG solutions
- Team: NYSERDA
Energy Nexus Group
Pace Energy Project
- Deliverable: Report summarizing power quality and reliability problems and evaluating DG solutions

Power Quality Evaluation Approach

- Identify specific areas in New York State with power quality and reliability issues (*underway*)
 - T&D Reliability Study, Load Pocket Analysis, State Energy Plan, etc.
- Interview industrial and commercial users to determine economic impact of power interruptions and identify state of the art solutions under consideration (*underway*)
- Evaluate various DG options as potential solutions; compare to other commercially available options and gauge user acceptance of DG solutions (*pending*)

Interview Objectives

- Evaluate impact of power quality on operations
 - Process disruptions and restarts, equipment damage, lost productivity, quality, and business, health and safety
- Quantify the costs of power quality/reliability incidents
- Identify conventional solutions under consideration
- Understand economic decision criteria
- Gauge receptivity to DG-based solutions to power quality/reliability issues

Evaluate DG Solutions to Power Quality and Reliability Problems

- Identify DG-based options to power quality/reliability issues (focus on continuous duty solutions)
- Compare economics of DG options to conventional solutions
- Evaluate customer acceptance of DG options through follow-up interviews
- Develop portfolio of DG options for critical applications and markets

NYSERDA DG-CHP Program Status

- CHP Workshop in New York City, June 20 and 21
 - Over 325 users, developers, state policy makers, and NGOs
- Announced an investment of \$20 million in 2002 for 45 CHP demonstration projects that will result in 35 MW of new capacity