



# 2009 DOE Hydrogen Program Review Presentation

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# OVERVIEW

## Timeline

- Start – Sept 2008
- Finish – Aug 2010
- 25% Complete

## Budget

- Total project funding
  - DOE share - \$197,425
- Funding received since contract
- \$135,000

## Barriers

- **Barriers**
  - > A. Lack of Readily Available, Objective, and Technically Accurate Information for Decision Makers for Specific Applications
  - > B. Disconnect Between Hydrogen Information and State and Local Planning Initiatives
  - > C. Lack of Technical Models to Rapidly Assess Costs and Values for Facility Development

## Partners

- Local, State, Federal
- CCAT
- Industry



# Background - Who We Are

- CCAT is a non-stock, tax-exempt corporation and is funded under federal and state grants.
- CCAT's Energy Program focuses on:
  - Energy planning
  - Renewable energy and
  - Hydrogen advancement



# Background – What We Do

- Connecticut Hydrogen Roadmap
- Connecticut Hydrogen-Fuel Cell Coalition



# Project Objectives

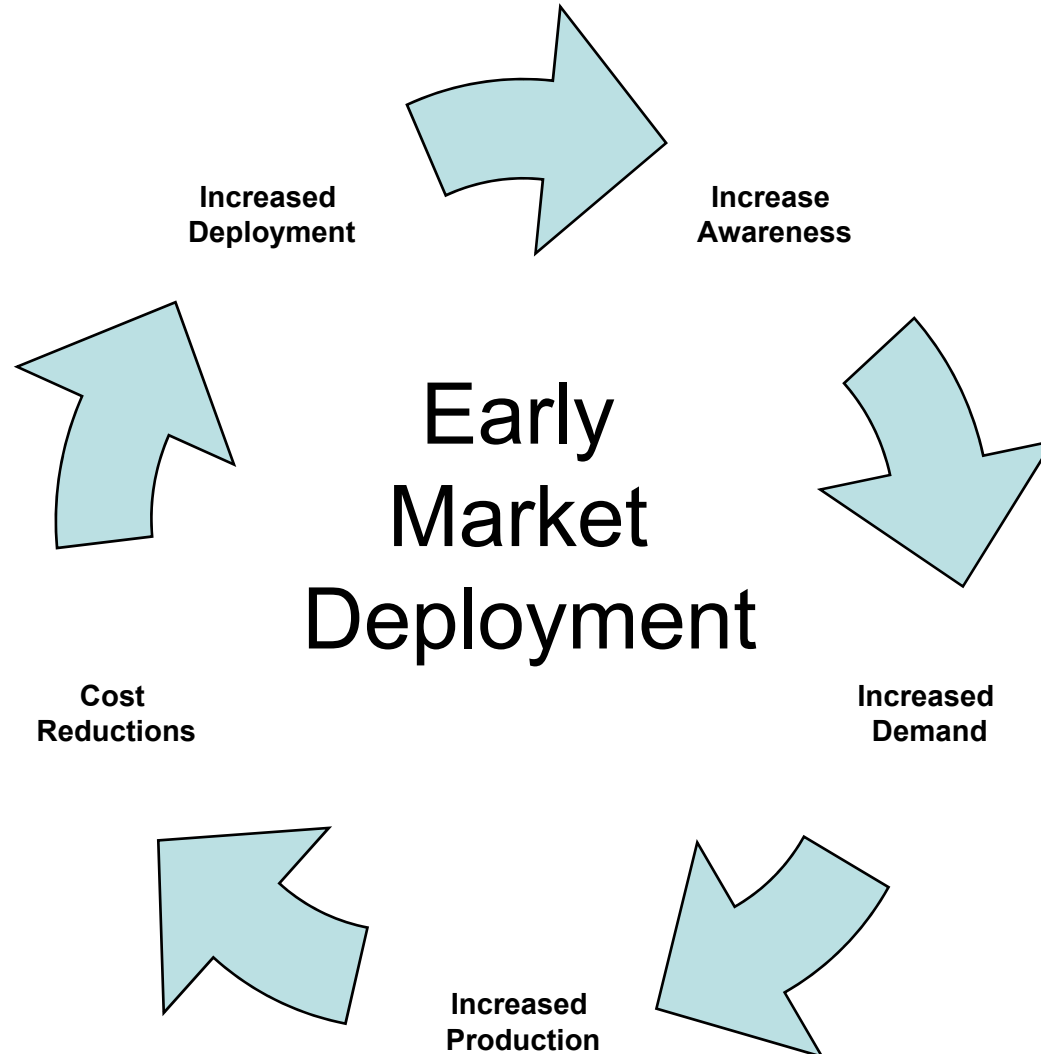
- Foster Improved Relationships
- Provide Technical Resources/Models
- Improve Exchange of Knowledge
- Coordinate State/Local Planning
- Facilitate Deployment



# Key Project Participants

- Local Partners
  - Mayors, First Selectmen, Public Works Officials
- State Partners
  - Legislators, State Agencies (DPUC, DEP, DECD, DOT)
- Federal Partners
  - DOE, US DOT, FTA, DOD, US Dept. of Agriculture
- Regional
  - Regional Planning Organizations/Council of Governments
- Utilities

# Implementation Strategy





# Project Components

The Partnership Building project has five components:

- 1: Identify key stakeholders; expand and strengthen partnerships
- 2: Develop resources to analyze potential sites for hydrogen and fuel cell deployment
- 3: Educate of state and local decision makers and other key stakeholders
- 4: Integrate state and local development plans with federal/DOE objectives
- 5: Identify financial and investment opportunities



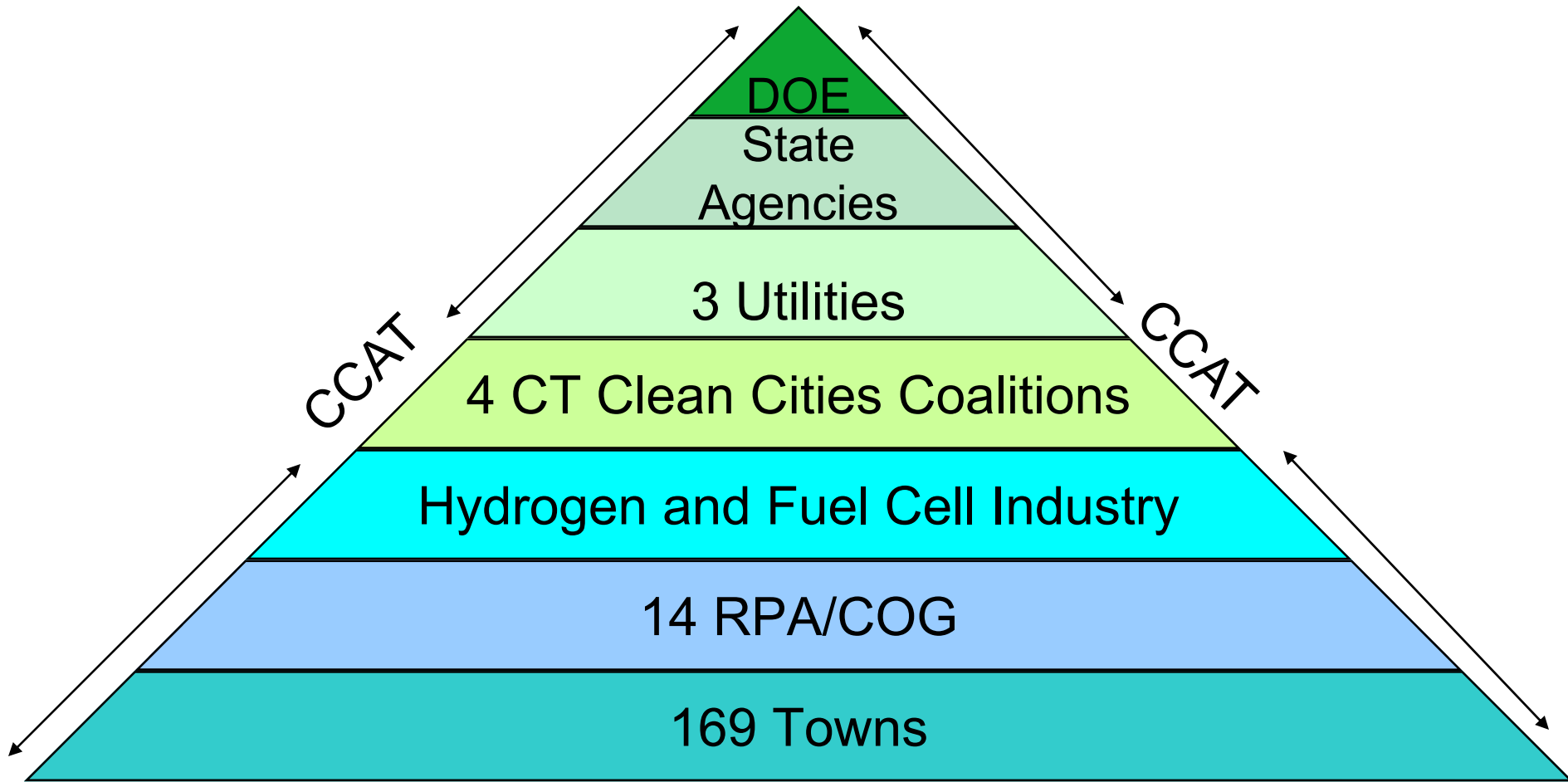


# Component 1

Identify key stakeholders; expand and strengthen partnerships:

- Municipal and state decision makers
- Connecticut's hydrogen and fuel cell industry
- Research institutions
- Regional Planning Organizations/Council of Governors
- Clean Cities Coalitions
- Utilities (Public Service Companies – electric, natural gas)

# Key Stakeholders





# 4th Quarter 2008 Activities

- Identify key stakeholders to expand and strengthen partnerships:
  - CCAT developed a database of key stakeholders including the following:
    - Transportation Officials
    - Public Works Directors
    - School Superintendents
    - Police Chiefs
    - Mayors/First Selectmen
    - Building Officials
    - State Agency Representatives
    - State and Federal Legislators
    - Utilities
    - Industry



## Component 2

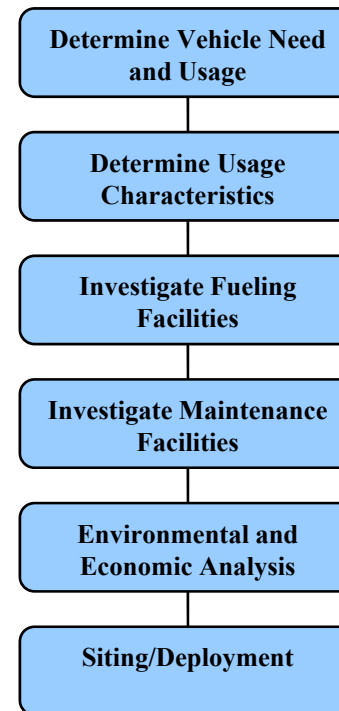
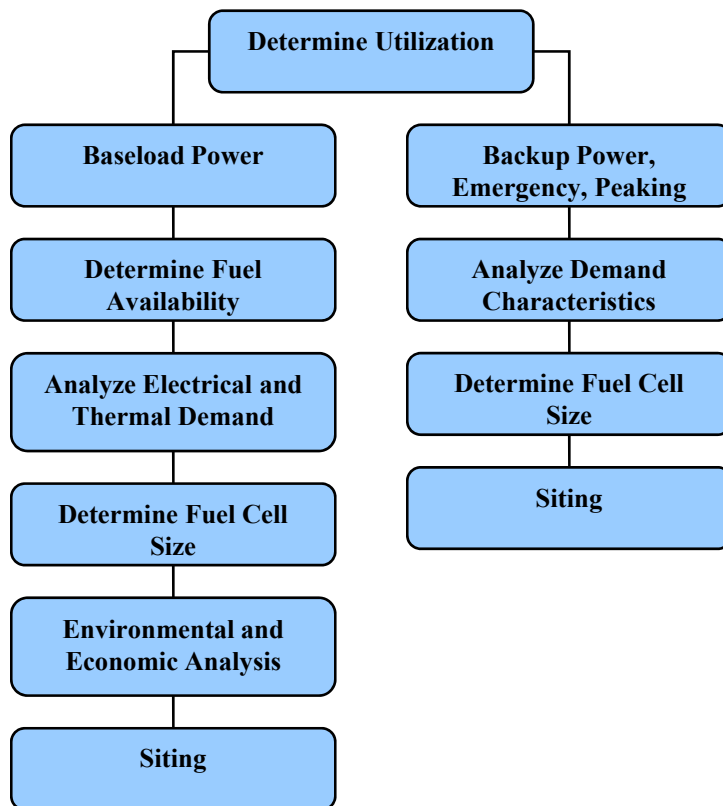
Develop resources to analyze potential sites for hydrogen and fuel cell deployment:

- Develop criteria for favorable deployment
- Identify potential sites
- Develop models
  - Electric and Thermal Requirements
  - Environmental Value (lbs/kWh)
  - Energy Management (kWh/peak/off peak)
  - Renewable Energy (RPS/REC)
  - Technology Comparative Analysis (electric/thermal value)
  - Cost/Economics (ROI)



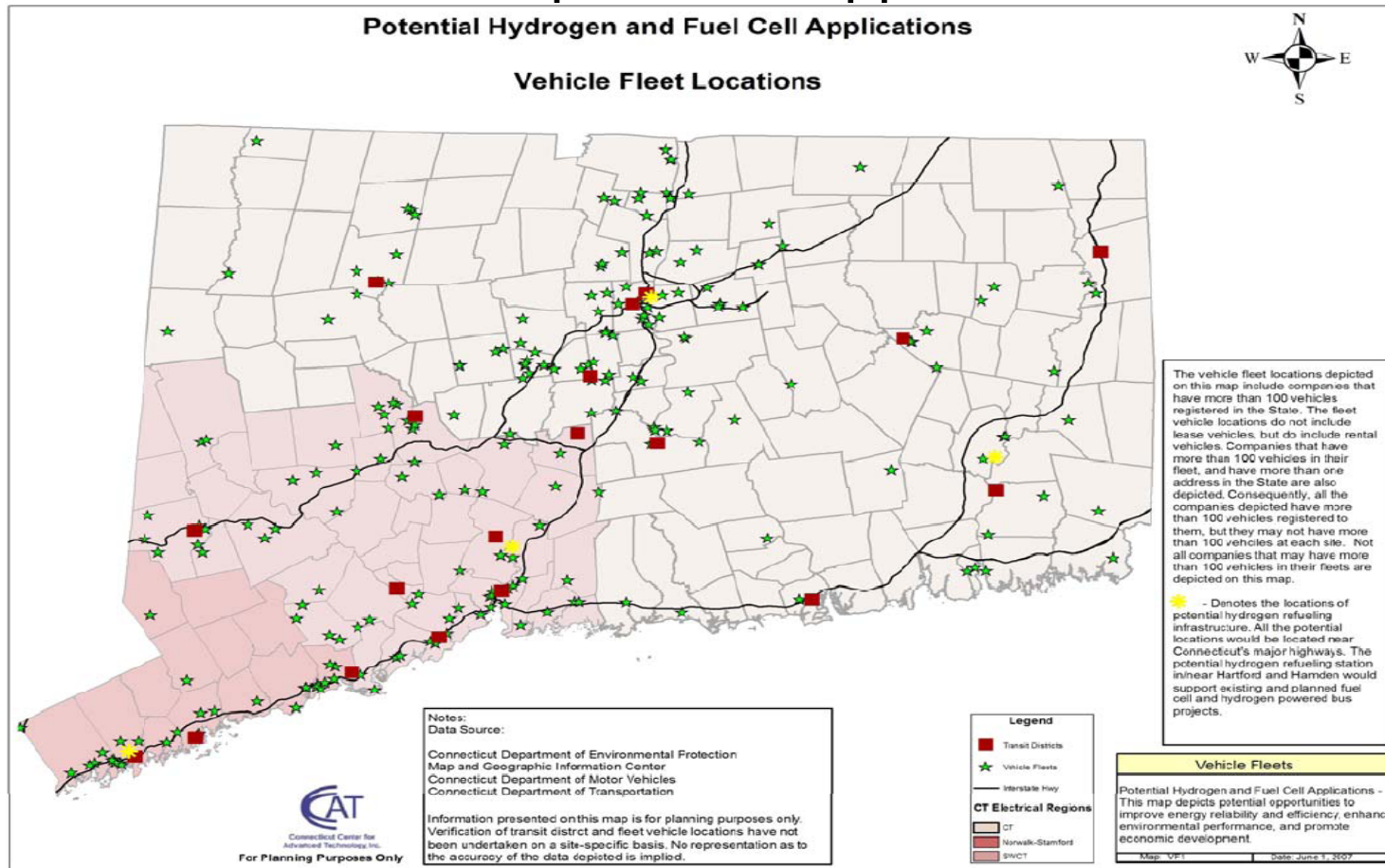
# 4th Quarter 2008 Activities

## CCAT Developed Criteria for the Assessment of Potential Stationary Power and Transportation Applications

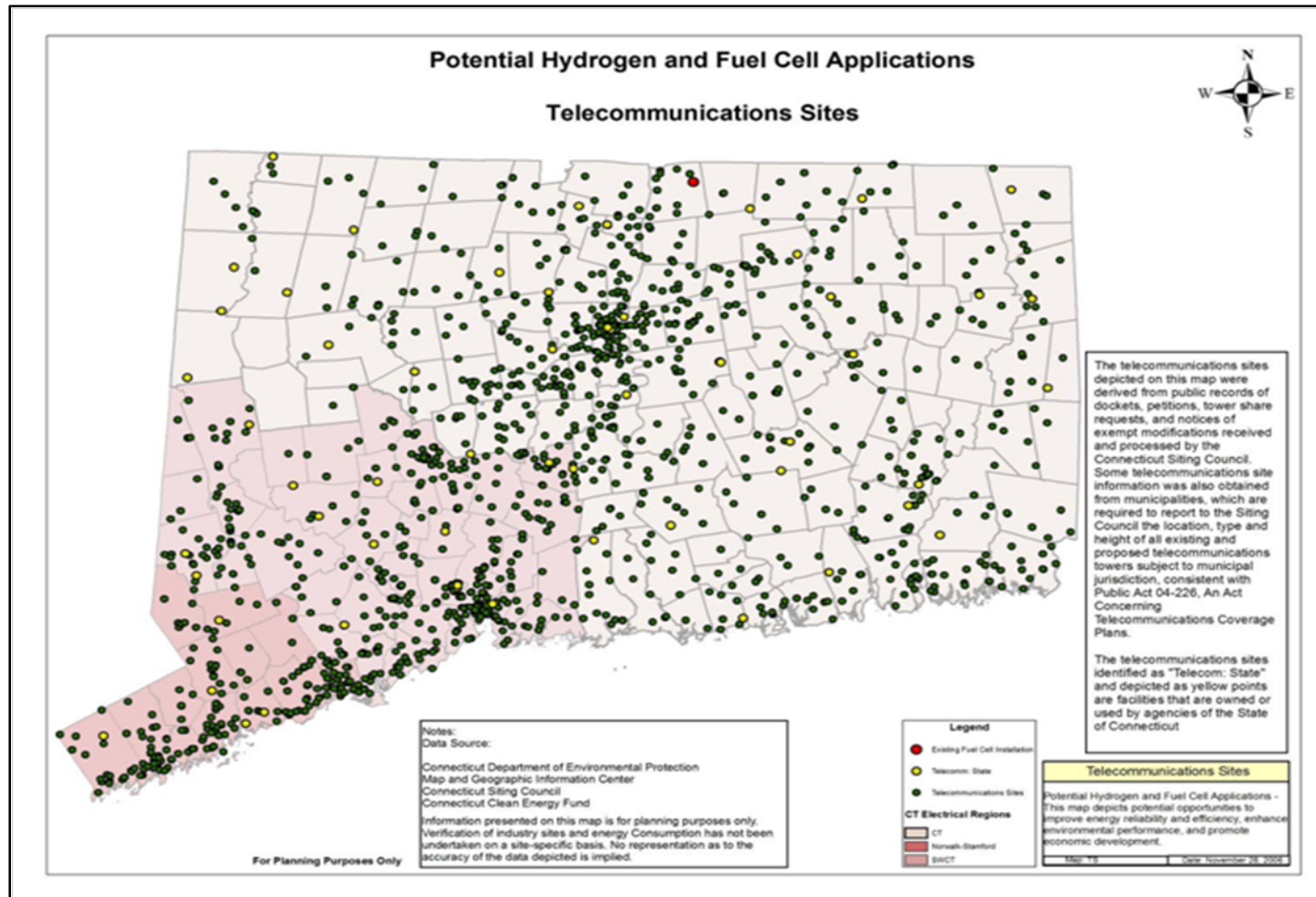


# 1st Quarter 2009 Activities

## CCAT Identified Potential Sites for Stationary Power and Transportation Applications

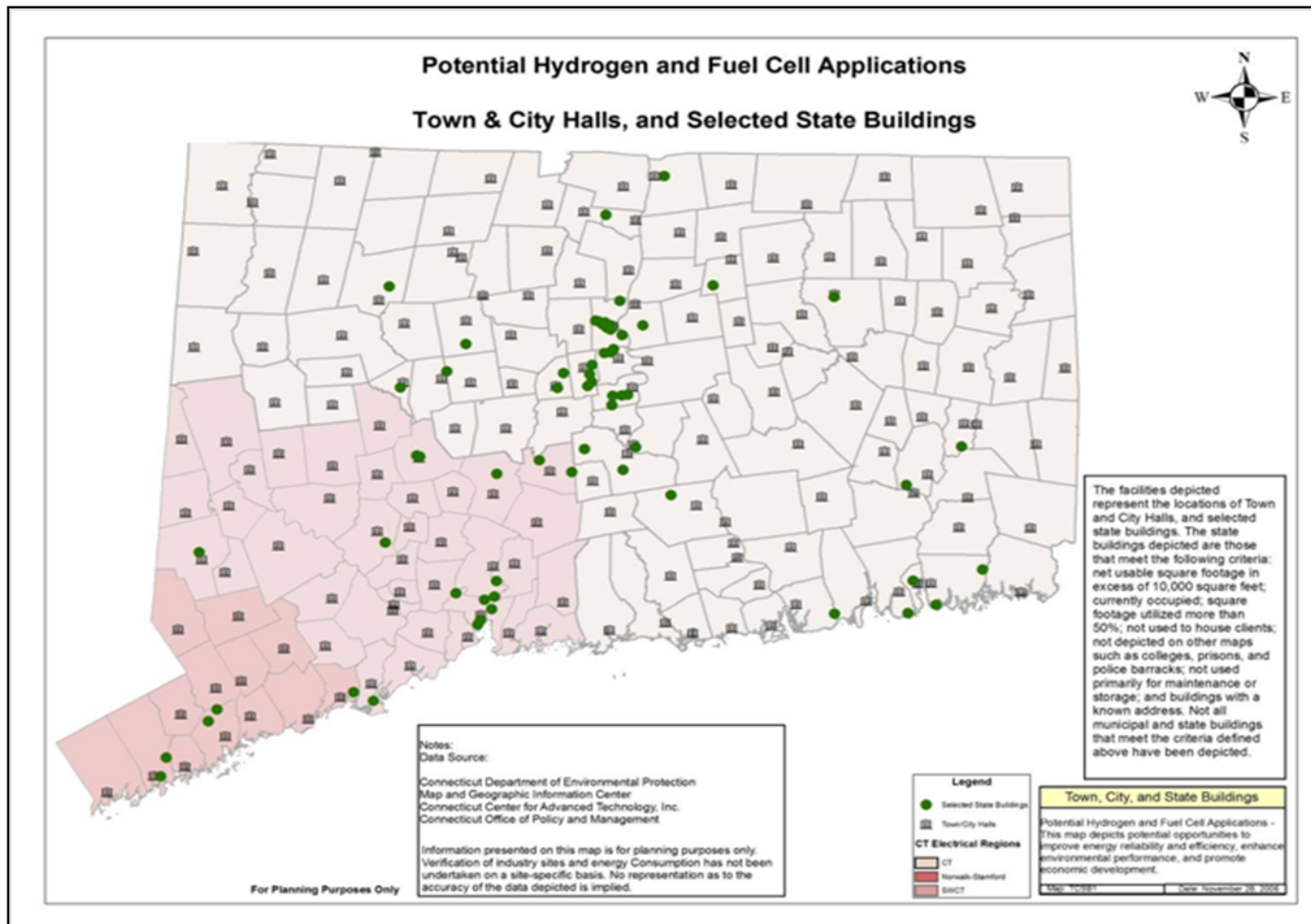


# Telecommunication Sites



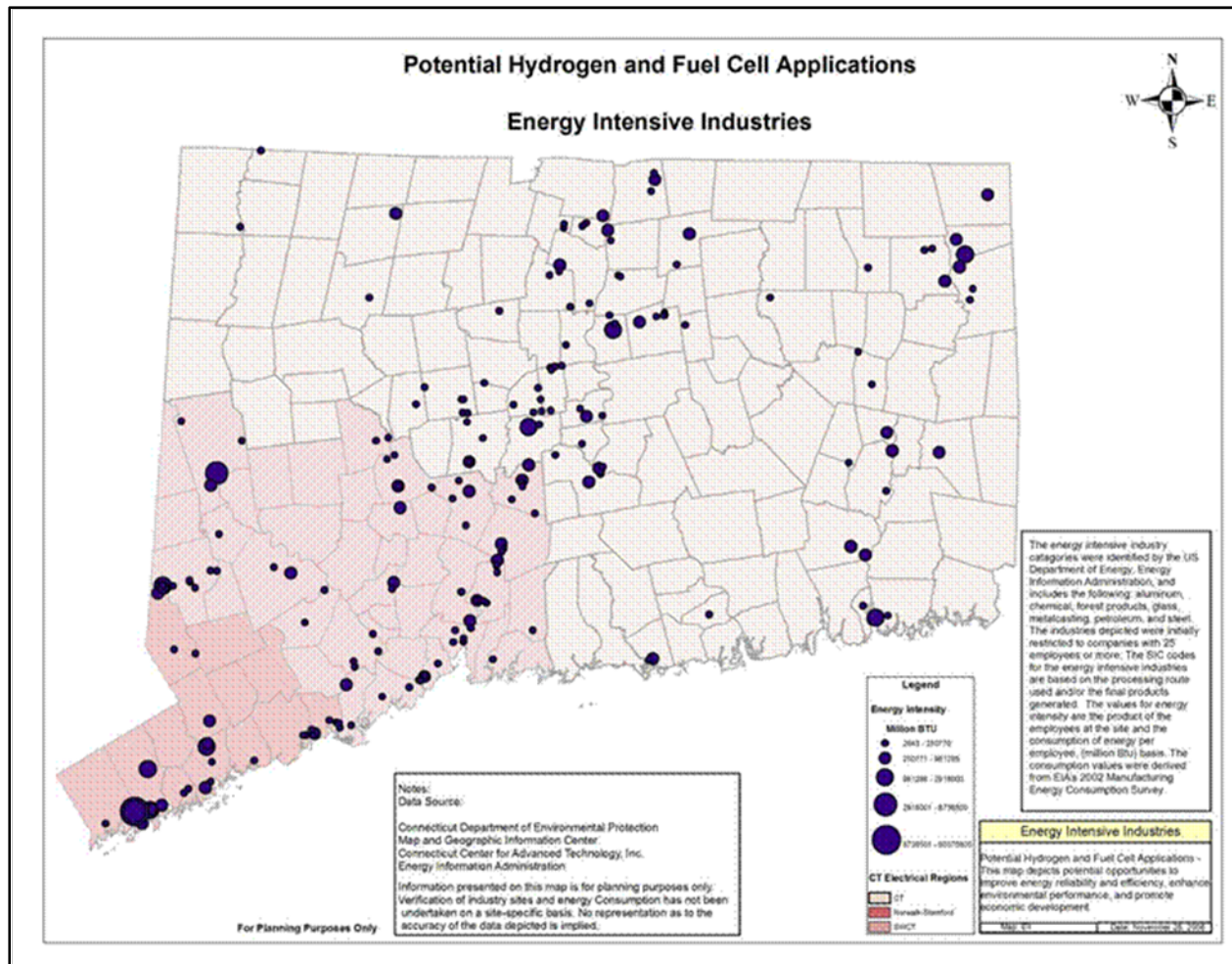


# Town & City Halls, and Selected State Buildings





# Energy Intensive Industries





# Component 3

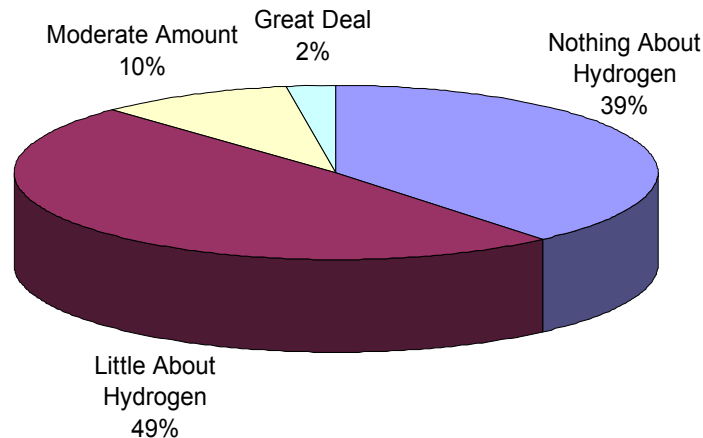
## **Educate state and local decision makers and other key stakeholders:**

- Identify level of education among stakeholders
- Develop online models with guidance to interpret results
  - Energy Value
  - Environmental Value
  - Cost (ROI)
  - Renewable Energy
  - Comparative Analysis
- Working sessions with participants to identify/assess opportunities for funding and development

# 4th Quarter 2008 Activities

CCAT Surveyed the Level of Knowledge of State and Local Decision Makers and Key Stakeholders

**88% of those surveyed knew little to nothing about hydrogen and fuel cell technology.**



**Q2: Hydrogen is an energy storage medium. Which of the following statements best describes your level of knowledge on hydrogen and fuel cell technologies?**



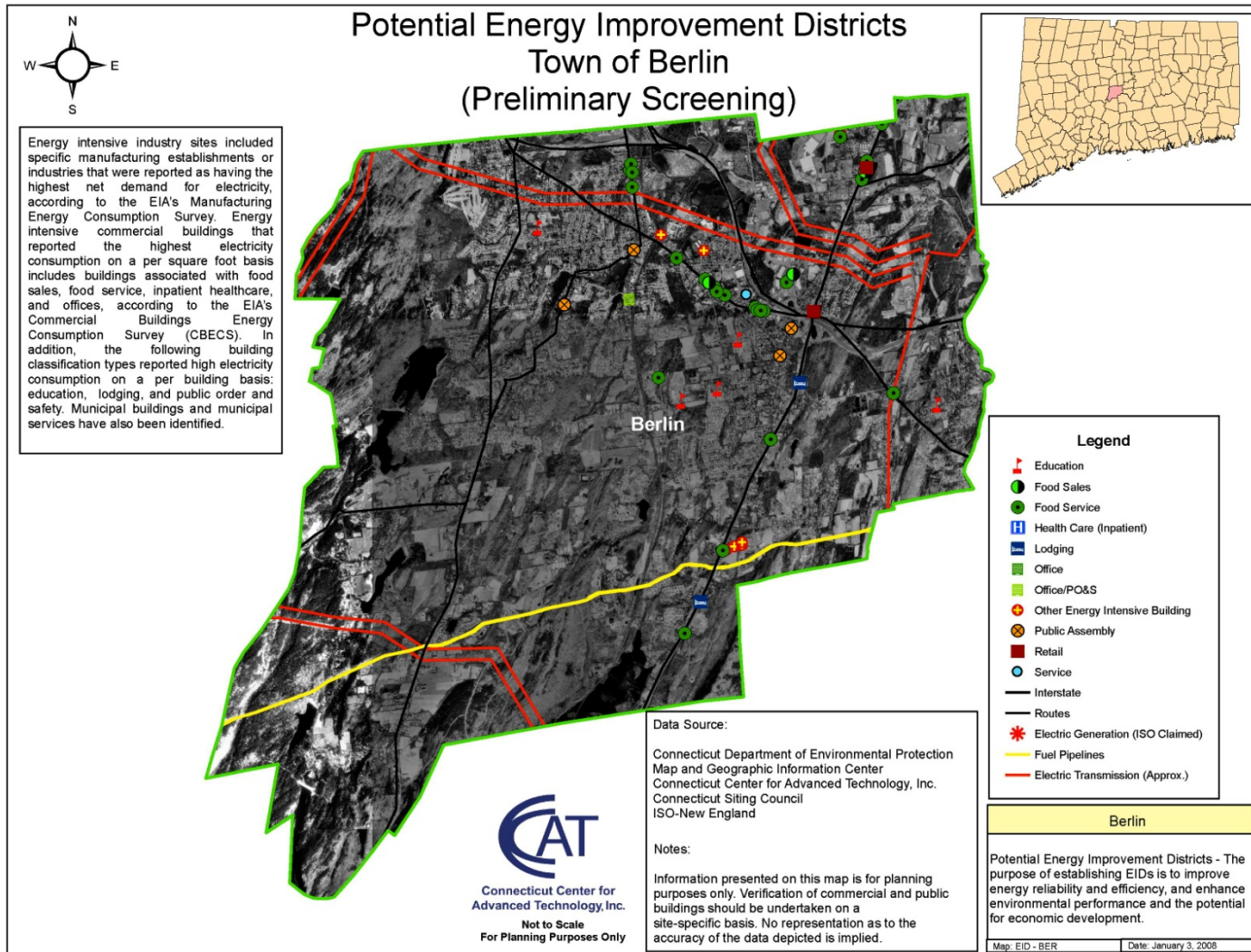
# Component 4

## Integrate State/Local Energy Plans with Federal Objectives

- Coordinate with state/local decision makers with federal policy
- Facilitate integration with state/local development plans
  - Enhance energy reliability and security
  - Improve transportation efficiency
  - Promote economic development
  - Reduce air pollutants and greenhouse gas emissions
  - Risk management and cost control
- Regional coordination

# Municipal Energy Planning

EXAMPLE ONLY





# Component 5

## Identify Financial and Investment Opportunities

- Integrate results of economic model (Proforma)
- Identify strategies for funding
  - Local
  - State
  - Federal
- Identify opportunities to leverage local, state, and federal funds



# Project Website


Connecticut Center for Advanced Technology, Inc.

March 19th, 2009

ABOUT CCAT
SERVICES
EVENTS
PUBLICATIONS/NEWS

- ▶ Energy Home
- ▶ Energy Overview
  - ▶ Who We Are
  - ▶ Services
- ▶ Contact Energy
- ▶ Hydrogen Advancement
  - ▶ Fuel Cells for Municipalities
  - ▶ Renewable Energy
  - ▶ Connecticut Hydrogen-Fuel Cell Coalition
  - ▶ Energy & Infrastructure Planning
  - ▶ Center for Energy Solutions and Applications
    - ▶ Center Eligibility Questionnaire
  - ▶ What is the Center?

## U.S. Department of Energy Partnership Initiative

The Connecticut Center for Advanced Technology, Inc. (CCAT) will lead a "Partnership-Building" initiative with the U.S. Department of Energy (DOE) to promote the use of hydrogen and fuel cell technology in early market applications. This initiative will be targeted to state and local government officials and other appropriate stakeholders.



CCAT administers the [Connecticut Hydrogen-Fuel Cell Coalition \(CHFCC\)](#), and recently developed the [Plan for Fuel Cell Economic Development \(Hydrogen Roadmap\)](#) for the State of Connecticut. CCAT is the recognized leader in the State of Connecticut for the advancement of hydrogen and fuel cells.

The overall purpose/goals of this initiative is to reduce energy costs, improve energy reliability, and to enhance environmental performance.

Purpose / Goals
Project Components
Models



# Project Schedule

Activity	4 <sup>th</sup> Qtr 2008	1 <sup>st</sup> Qtr 2009	2 <sup>nd</sup> Qtr 2009	3 <sup>rd</sup> Qtr 2009	4 <sup>th</sup> Qtr 2009	1 <sup>st</sup> Qtr 2010	2 <sup>nd</sup> Qtr 2010	3 <sup>rd</sup> Qtr 2010
<b>Identify key stakeholders; expand and strengthen partnerships</b>								
Develop resources to analyze potential sites for hydrogen and fuel cell deployment								
<b>Educate state and local decision makers and other key stakeholders</b>								
Integrate local energy plans with state transportation, energy, and climate change action plans								
Identify financial and investment opportunities								
Organize and Hold Regional Briefing								
Survey level of knowledge of local and state decision makers and key stakeholders								
Outreach and Reporting								

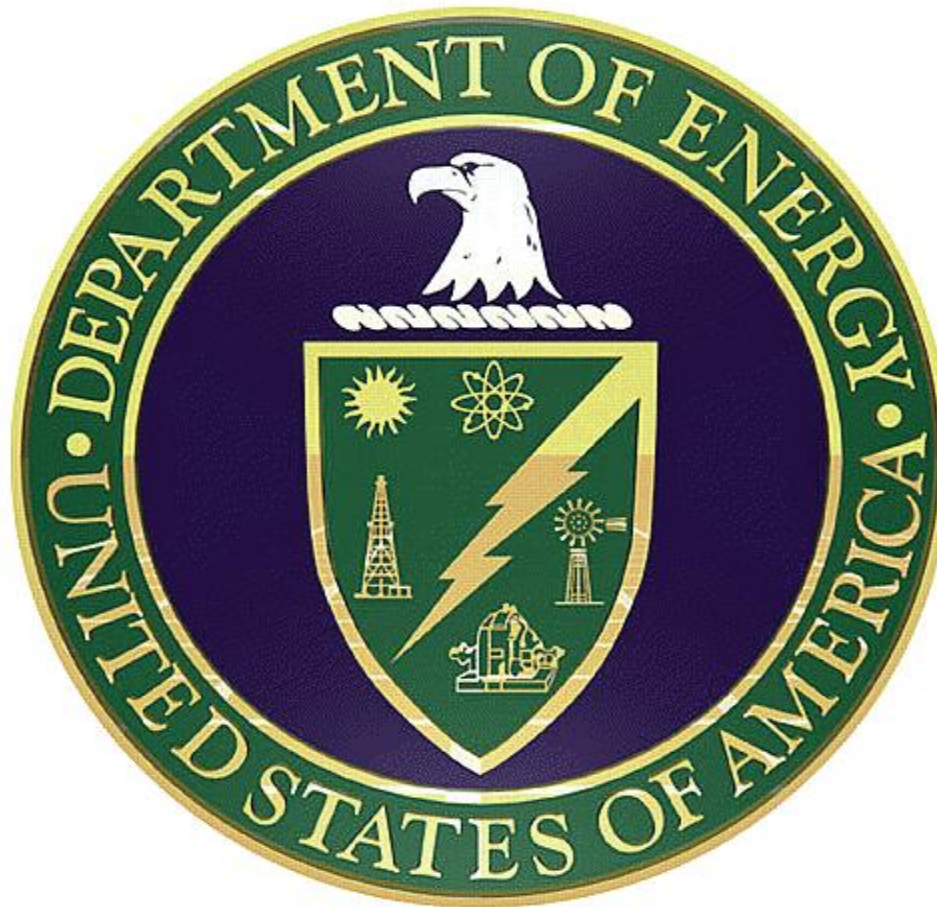




# Project Summary

- Relevance – Help to reduce conflict, improve state/regional and municipal relations, and provide community supported solutions to address local and regional energy issues.
- Approach – Develop partnerships and technical models to encourage and promote hydrogen and fuel cell technology in early market applications.
- Progress
  - Identified key stakeholders.
  - Assessed stakeholder awareness.
  - Developed resources and criteria to analyze sites/deployment for potential market opportunities.
- Collaborations – Collaboration will begin with local, state and federal partners.

# *Acknowledgment*





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