

# Lean Project

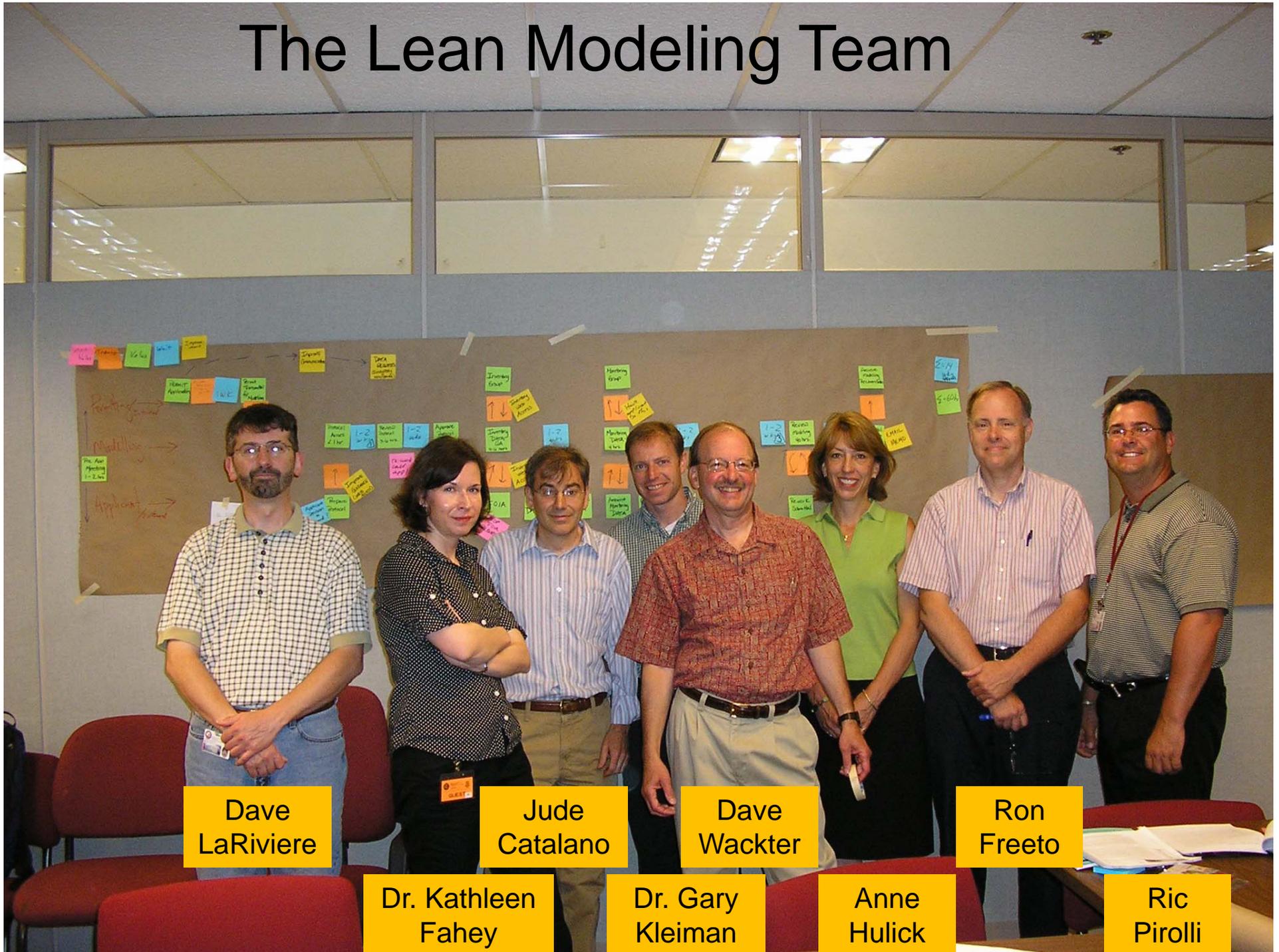
## Major Source Air Permit Modeling

June 9-12, 2008



Power Plant Air Permit Modeling

# The Lean Modeling Team



Dave  
LaRiviere

Dr. Kathleen  
Fahey

Jude  
Catalano

Dr. Gary  
Kleiman

Dave  
Wackter

Anne  
Hulick

Ron  
Freeto

Ric  
Pirulli

# Tracy Babbidge (Team Champion), Bill Simpson and Holly Miller-Sullivan discuss Emission Inventory

Tracy Babbidge

Bill Simpson

Holly Miller-Sullivan



# **NESCAUM States**

**Founded in 1967 to address air pollution problems in New England, New York and New Jersey.**





Fred Shamburg: Our Sensei

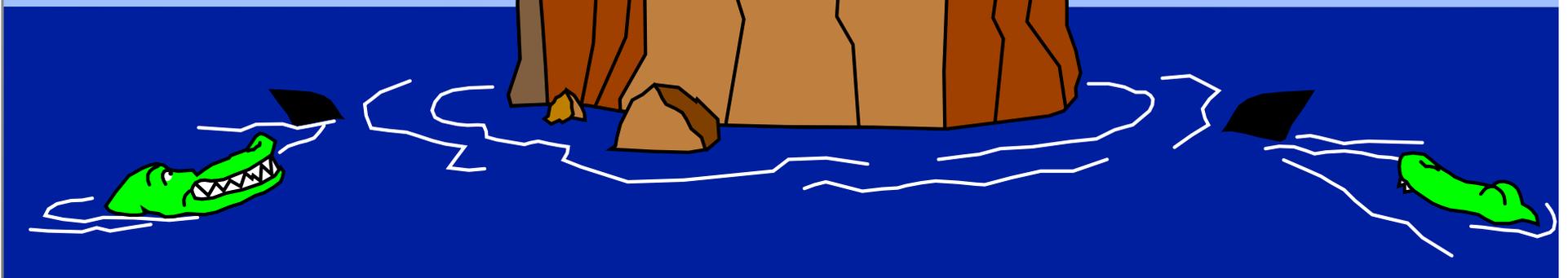
# Why Are We doing this?

- Connecticut needs
  - Reliability
  - Competitive Power Prices
  - Improved Air Quality
- Minimizing regulatory uncertainty can support investments in clean, new generation.



# Environmental Policy

# Energy Policy



# DEP's Processes are an Integral Step to Achieving State Goals

*New  
Transmission*

*New  
Generation*

**DEP  
Permitting**

**Modeling**

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6★

THE HARTFORD COURANT

SECT

## State Chooses Three Firms To Build New Power Plants For Peak Periods Plants Will Add To Power Supply

By **LYNN DOAN**  
COURANT STAFF WRITER

Three power companies, including a partnership with United Illuminating, have been tentatively chosen by state regulators to build new "peaking" power plants alongside existing plants in Bridgeport, Milford and New Haven.

The new plants, two of which are expected to be operational by 2010,

will together generate nearly 700 megawatts, enough electricity to power between 525,000 and 700,000 typical homes. Peaking plants, usually fueled by natural gas, are designed to start up quickly when demand for electricity spikes, such as on hot summer days when air conditioners are in heavy use. Electricity customers have been paying a premium rate, set by the Federal Energy Regulatory Com-

mission, for power at peak times because the state doesn't have adequate power reserves to use when demand for electricity is at its highest. The new plants should save customers more than \$30 million a year on their electric bills by bringing the state the peak power necessary.

The companies, selected by the state Department of Public Utility and Control in a draft decision

Wednesday, will be reimbursed through electric rates for the cost of building and operating the plants, plus an amount for a return on their investments. The General Assembly set up the arrangement last spring as a way to control electric rates.

"This is very important. We're lacking in peaking power, and the

PLEASE SEE **POWER**, PAGE B12

### ► UNITED ILLUMINATING PLANT

Location: **Milford**

Plant size: **194 megawatts**

Expected completion date: **June 2010**

Expected cost: **\$200 million**

### ► PSEG POWER LLC PLANT

Location: **New Haven**

Plant size: **134 megawatts**

Expected completion date: **June 2012**

Expected cost: **n/a**

### ► BRIDGEPORT ENERGY II PLANT

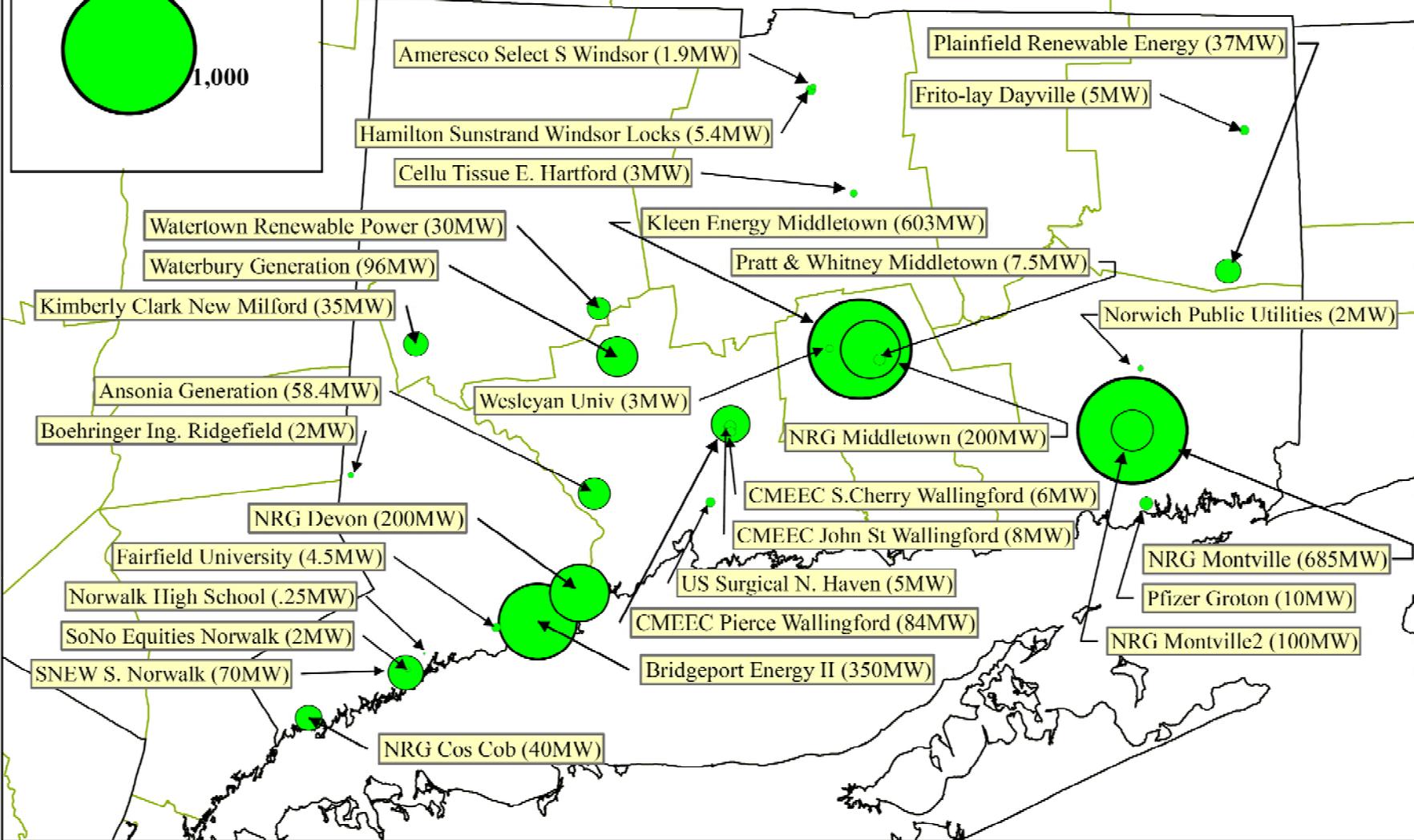
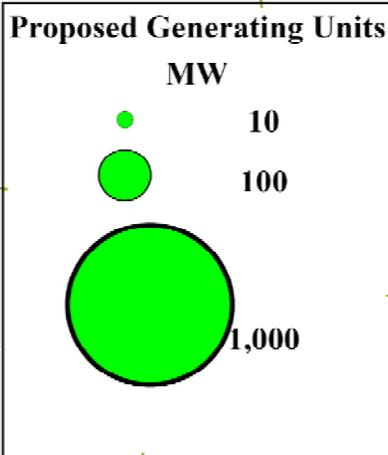
Location: **Bridgeport**

Plant size: **360 megawatts**

Expected completion date: **December 2010**

Expected cost: **\$400 million**

# Proposed and Recently Permitted (since 2006) Electric Generating Units in Connecticut that could Supply Peak Power Demand



# LEAN Modeling Team Objectives

- Learn and apply Lean principles
- Reduce the processing time by 1/3
- Develop and track key performance indicators (KPI)
- Improve information transfer
- Develop project plan for implementation.





## Lean Project Team Charter

<b>Project Name:</b>	<b>Major Source Air Permit Modeling</b>	<b>Dates:</b> <b>Times:</b> <b>Location:</b>	<b>June 9 – 12</b> <b>8:30 – 4:30 PM</b> <b>See Agenda</b>
<b>Training and Brainstorming Session:</b>	<b>To document current state and identify areas of efficiency</b>	<b>Dates:</b> <b>Times:</b> <b>Location</b>	<b>See Agenda</b>
<b>Daily Update Meetings:</b>	<b>Days 1, 2 and 3</b> <b>3:45 pm to 4:30 pm</b> <b>See Agenda for locations</b>	<b>Final Presentation:</b>	<b>Day 4, June 12<sup>th</sup></b> <b>8:30 – 4:30 PM</b> <b>Russell Room</b>
<b>Champion (s):</b>	<b>Tracy Babbidge</b>	<b>Team Leader:</b>	<b>Dave Wackter</b>
<b>1 Problem Statement:</b>	Major source air modeling review is impacting the timely issuance of new source review permits.		
<b>2 Project Scope / Objectives:</b>	Update and streamline modeling process to eliminate delay. Develop Project Plan to implement changes.		
<b>3 Key Team members:</b>	Dave Wackter, Jude Catalano, Dave LaRiviere, Ric Pirolli, Ron Freeto, Anne Hulick, Gary Kleiman, Kathleen Fahey		
<b>4 Goals:</b>	Reduce the processing time by 1/3. Develop time measurement system for tracking and reporting projects Increase efficiencies in disseminating inventory data Update guidance and make process more visible to stakeholders		
<b>Tools</b>		<b>M</b>	Charter Form
		<b>M</b>	Idea Tracking Chart (ITC)
		<b>M</b>	Progress Report
			Cost Reduction Form (Form 3)
			Training Plan Form
			Standard Combination Work Sheet
			Measurement Graphs / Improvement Suggestion Logs
			Visual References and Controls (SOPs, PFD's, Shadow boards and boxes,)
			6 S Survey
			Spaghetti Diagram
			Product Process Map
			Standard Worksheet
			Video Tape and / or Observe Set ups Set up Analysis Sheet (Min. of 7 Set-ups per week)
			Time Observation Sheet
		<b>M</b>	Value Stream Map
			Product Mix Matrix
<b>M = Mandatory Use</b>			
<b>R = Recommended Use</b>			
<b>NR= Not Required</b>			

# Lean Tools

- Plan-Do-Check-Act
- Walk-through-spaghetti chart
- Value stream mapping
- Work with stakeholders
- Brainstorming
- Key performance indicators
- Project plan tool

# PLAN DO CHECK PLAN

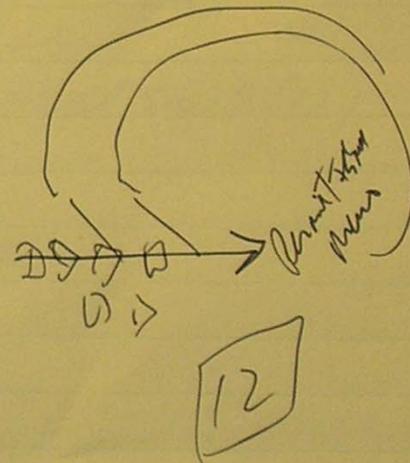
till noon (1) OUTLINE Flow

(2) IDENTIFY OPPORTUNITIES

lunch 12-12:30

Post Noon WALK THROUGH Permitting Process

- major chunks in Green
- break down major tasks



3:45 Presentation

- preliminary USM (on Brown Paper)
- i.d. low-hanging fruit

## Day 1- Plan

Day 2- Sam Sampieri is asked to join the group to share experiences with DEP.



# Day 2- Brainstorm 1-year plan

## 1 Yr Plan

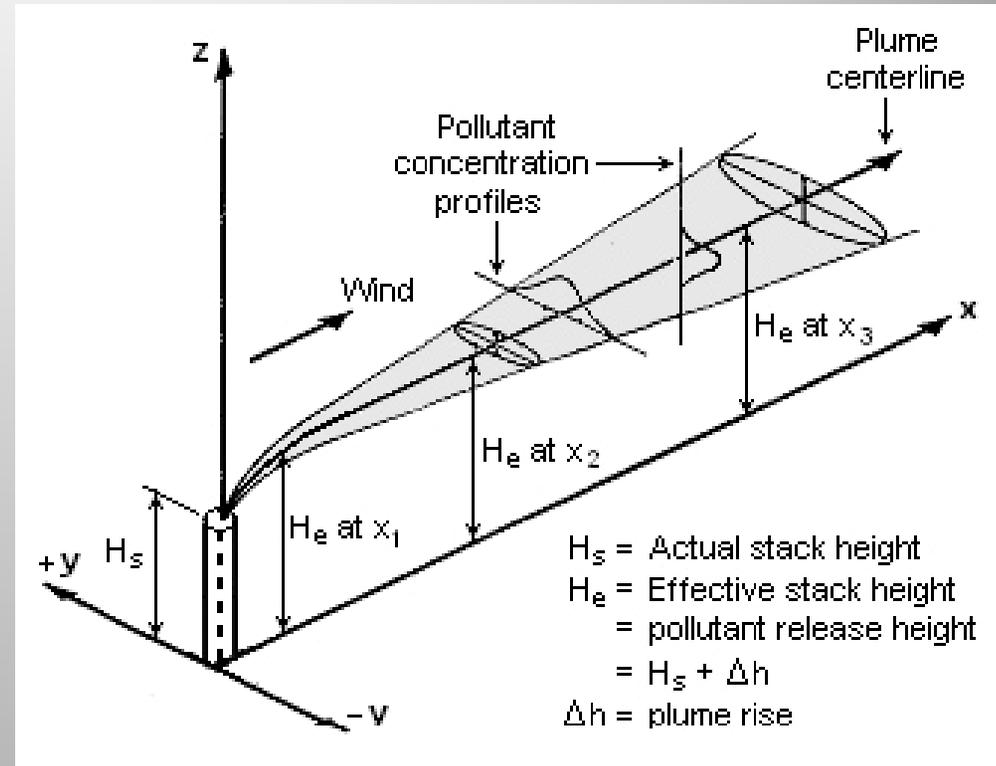
- Guidance Rewritten
- Regional Coordination
  - on common guidance
- <1yr?
  - Coord w. consultants
    - outreach, workshops; SIPRAC Work Group
  - Standardize Data Sets
    - Meteorology
    - Monitoring Data
    - Emission Inventory
  - NESCAUM Permit Modeling Committee Mtg Jun 24/25
- <3mos?
  - Improve Web ACCESS
    - for entire process
  - ~~Eliminate~~ FOIA Request Process
  - Electronic Transmittals of Internal Communications
  - Q/A of Emissions Data in Real Time
    - new permits
    - enforcement inspections
    - Emission Statements
    - Other
- <6mos?
  - Performance Trend
  - Periodic Meetings
    - ID. Implementation Process

## LEAN PROJECT MAJOR SOURCE AIR PERMIT MODELING KEY PERFORMANCE INDICATORS (KPI)

- Track In/Out Dates:
  - 1)Permit Application Receipt
  - 2)Protocol transmittal date
  - 3)Pre-modeling meeting date
  - 4)Protocol Approval date
  - 5)Receipt of modeling report
  - 6)Rework request
  - 7)Rework receipt
  - 8)Approval of modeling
- Implement
  - 1)Design spreadsheet for tracking—table, whiteboard
  - 2)Communicate metrics between groups

Project Name	Dates			Comments
	a)	b)	c).....	

# Modeling Basics



## Dispersion Modeling Objectives

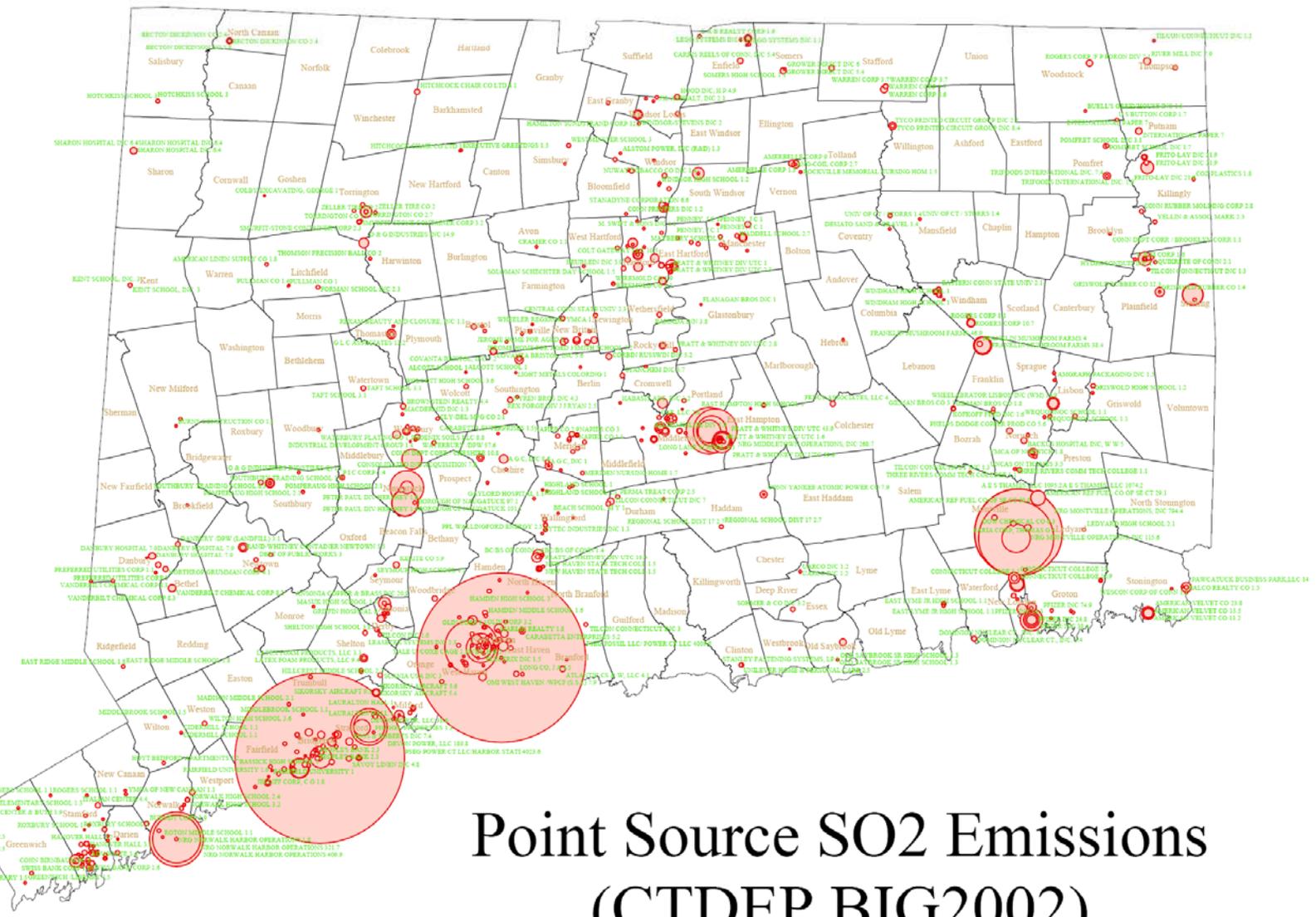
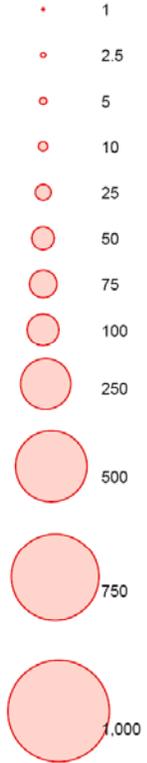
1. Support permit and enforcement reviews
2. Ensure proposed project will not degrade air quality



# Legend

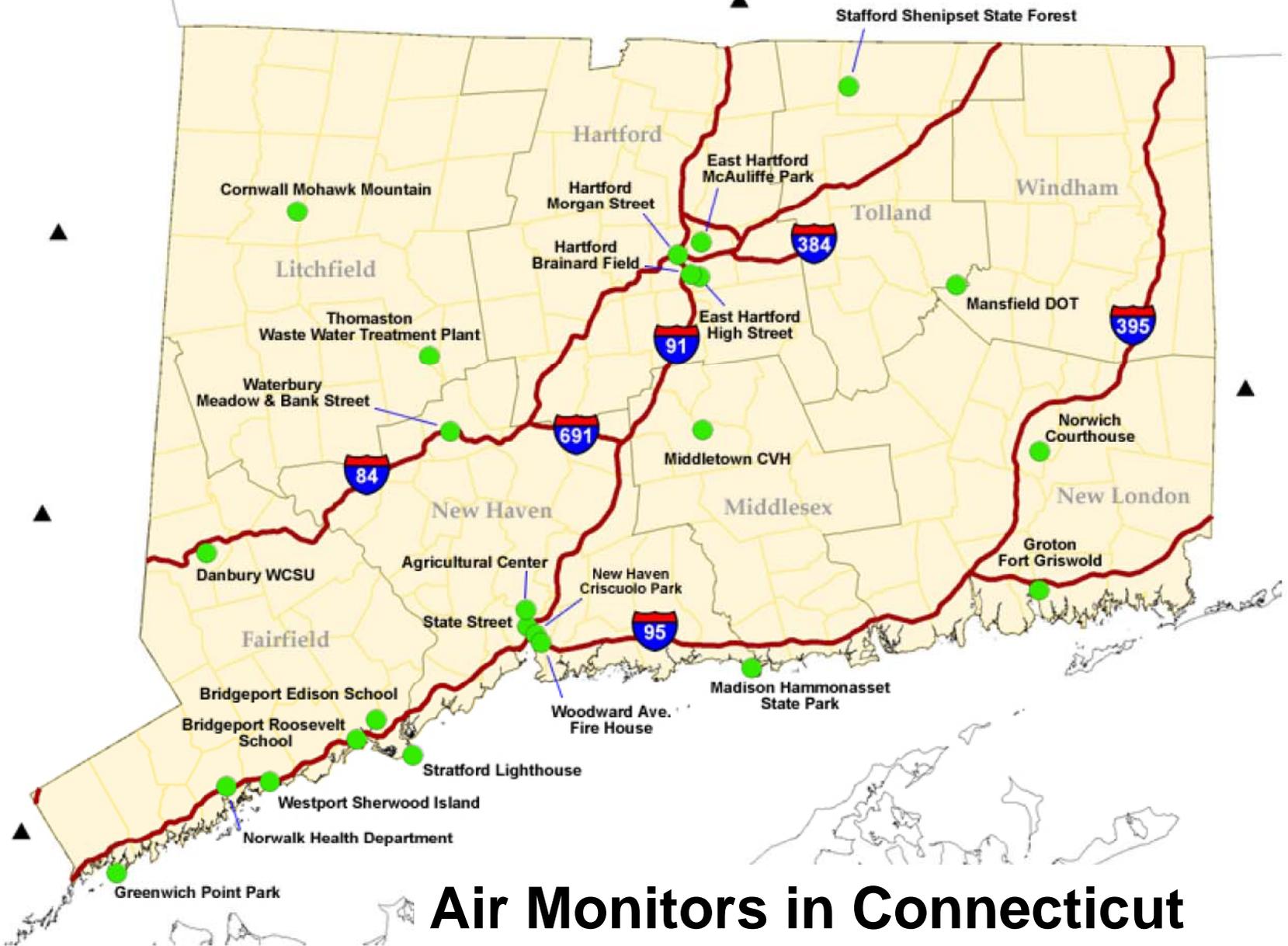
Tons / year

## SO2 Emissions



# Point Source SO2 Emissions (CTDEP BIG2002)

▲ indicates neighboring State's air monitoring site location



# Air Monitors in Connecticut

# What does the future hold?

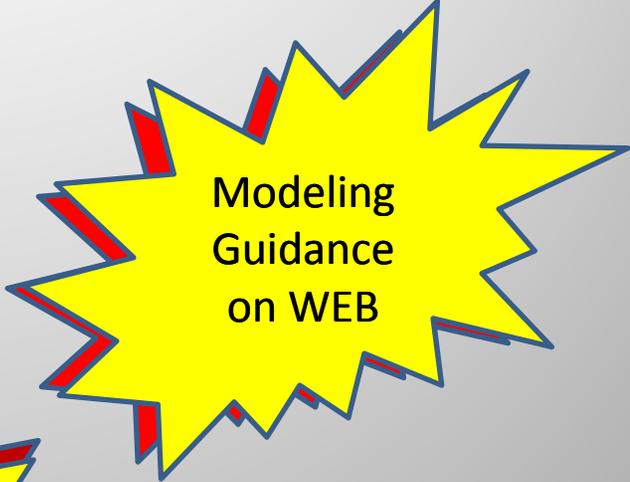
- Rewrite modeling guidance.
- Implement new business rules.
- Key Information Will be Accessible via Web
  - Meteorology
  - Ambient monitoring
  - PM 2.5 data
  - Emissions inventory
- Create & Maintain Visual Boards



# Aha Moments in LEAN Modeling



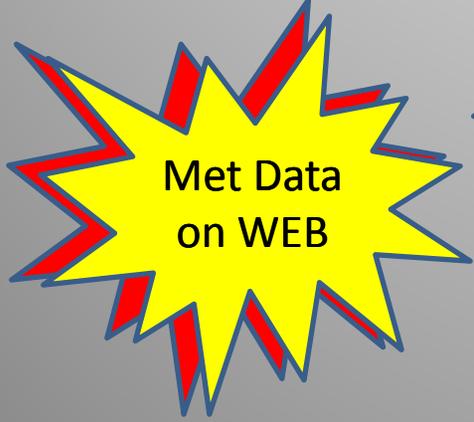
Business  
Rules on  
WEB



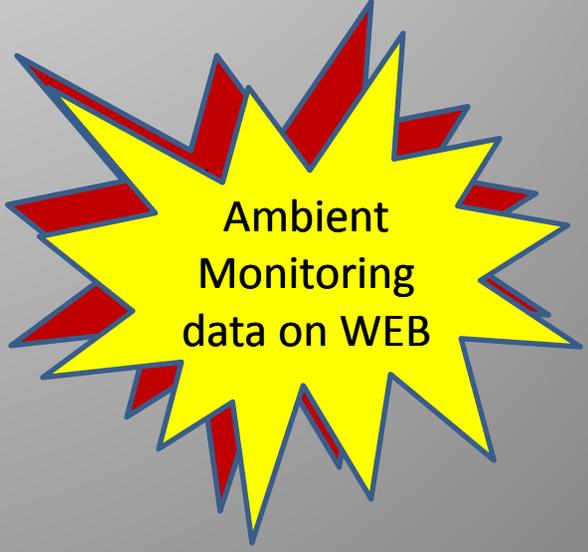
Modeling  
Guidance  
on WEB



Emission  
Inventory  
on WEB



Met Data  
on WEB



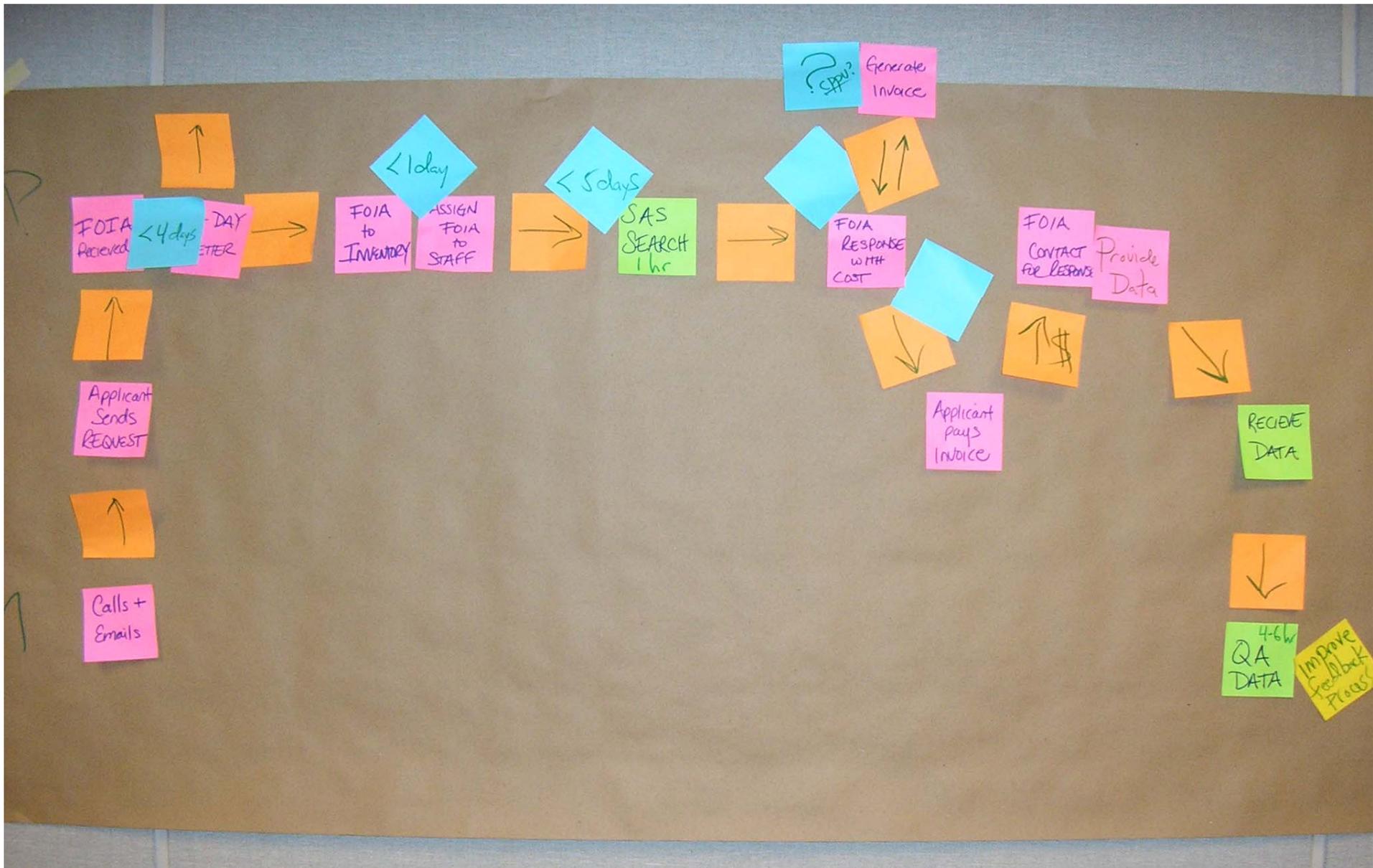
Ambient  
Monitoring  
data on WEB



Future State of Modeling Review  
 Note: start to finish is 6.5 weeks

~~AA~~ Meeting  
BA

Bureaucrats Anonymous

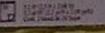


## Day 2- Unnecessary FOIA for Emissions Inventory



Easel Pad  
Tableau à feuilles mobiles  
Block de Hojas Reposicionables

561



Self-Sticking Easel Sheets  
Feuilles autoadhésives  
Hojas autoadhesivas



# REWRITE GUIDANCE by Fall '08

- Review CURRENT guidance from other states
- > (MAINE) NY, NJ + E.P.A
- meet w/ Region NESCAUM modeling ~~AT~~ contacts
- I.D. BEST GUIDANCE for Template
- DRAFT CT VERSION
- PROVIDE to SIPRAC for COMMENT
- FINALIZE Document
- POST ON Web

PREPARE  
Memo

NY -

meTextFile

ATA SETS  
Syn datasets

DANCE

A  
B  
Bu

# NEW BUSINESS Rules ~~SSS~~

Now 1. Request Modeling Protocol  
as part of permit application  
- Require 2 Applications 1 permitting  
+ 1 modeling - R.A.P

'09 2. INVENTORY GROUP QA INVENTORY  
DATA. Tracy-Bill

Now 3. COMMUNICATE electronically  
- CREATES TIME RECORD  
- ELIMINATE Sup. SIGN-OFF  
4. - Application

Now 4. Request Modeling Meetings

Now 5. Permit Pre App meetings  
W/O Modeling

# Plan Met Data Postings

1. d. Sites<sup>(n)</sup> yrs of data<sup>(s)</sup>

Download <sup>met</sup> data + USGS data

Q/A

or Post on Web

RUN AERMET + AERSURFACE

→ some yrs/sites already built

Post on Web

START - Now with available DATA SETS

Jude, SAM, Allie

09 Build new data SETS

1-2  
WKS

1-2  
WKS

Receive  
model  
Package



T OF  
ATE  
ARCH

RUN  
MODEL

SUBMIT  
MODEL

# EMISSIONS INVENTORY A

Fall '08

- Build text file w/ appropriate DATA Elements (BILL S, TRACY) (~~1-22~~) (~25)
  - WRITE SAS computer program to extract DATA.
  - QA/QC DATA?
- Post on Web (ALLIE)
- UPDATE ANNUALLY (INVENTORY GROUP)

Long TERM

//

EMIT INVENTORY System has  
public access  
(Holly, Bill, TRACY)

Lean Modeling Team Project Plan (6 12 08).xlsx

TASK/ACTIVITY	TASK		Timeline												EXPECTED RESULTS	
	OWNER(S)	PARTICIPANTS	June '08	July '08	Aug '08	Sept '08	Oct '08	Nov '08	Dec '08	Jan '09	Feb '09	March '09	Apr '09	May '09		June '09
<b>1. Rewrite modeling guidance</b>	Tracy	Dave, Jude, Sam	█	█	█	█	█	█	█	█						New Guidance on web  Input from States  Input from Applicants/Consultants
Review current guidance from other states		Jude, Sam	█	█	█											
Meeting with region modeling contacts		Dave, Jude	█	█												
Identify best guidance for possible template		Jude, Sam		█	█											
Draft CT version of guidance		Jude				█										
Provide to SIPRAC for comment		Dave					█									
Finalize document		Jude						█								
Post on web		Allie							█							
<b>2. Implement new business rules</b>	Management	Anne, Tracy, Ric	█	█	█	█	█	█	█	█	█	█	█	█	█	
Permit pre-app meetings w/out modeling		Ric	█													
Require 2 copies of permit application		Ric	█													
Request modeling protocol w/ permit appl		Ric	█													
Request Modeling Protocol electronically		Ric	█	█	█	█										
QA inventory data		Tracy, Bill S.	█	█	█	█	█	█	█	█	█	█	█	█	█	
Communicate electronically Creates time record Eliminate supervisor sign off		Tracy, Ric	█													
Request modeling meeting w/ applicant		Jude	█													
Eliminate FOIA request for inventory data		Tracy	█													
Periodic meetings of LEAN team		Anne, Tracy, Ric	█	█	█	█	█	█	█	█	█	█	█	█	█	
Electronic records retention		Liz	█	█	█	█	█	█	█	█	█	█	█	█	█	

Color Code Key: N Target, █ Trugglin, O Active, Future



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**Department of  
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## Air Quality Modeling

### Background on Air Quality Modeling:

The Clean Air Act – as amended in 1977 – mandated that air quality modeling be used as a tool to assess compliance with certain provisions of the Act. These provisions include attainment and maintenance of national Ambient Air Quality Standards and prevention of significant deterioration of air quality.

### What is Air Quality Modeling?

Air quality models use mathematical techniques to simulate the physical and chemical processes that affect air pollutants as they scatter throughout the atmosphere. Based on inputs of meteorological data and source information, these models are designed to characterize both primary and secondary pollutants that are either emitted into the atmosphere or are formed as a result of complex chemical reactions within the atmosphere. Monitoring of air quality, on the other hand, is normally only performed at a fixed location for a limited duration. Modeling, therefore, complements monitoring by filling in information gaps in space and time.

### What is the purpose of Air Quality Modeling?

Air Quality Modeling is used to assess the impact of air pollution from stationary sources. The Connecticut Regulations for the Abatement of Air Pollution require stationary sources of air pollution to be registered through the DEP, so Modeling is also the way to obtain a Permit to construct new sources or to modify existing sources. Air Quality Models can help in determining the needed controls to bring a source to attainment standards as well.

### Further information:

[EPA Air Quality Modeling Information](#)

[CT DEP Guidelines for Air Quality Modeling](#)

# Mock-up Future Web Site



DEP Search:  
   
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### Air Quality Modeling Guidelines:

- [General Requirements](#)
- [Modeling Selection](#)
- [Source Data](#)
- [Meteorological Data](#)
- [Background Air Quality](#)
- [Analysis](#)

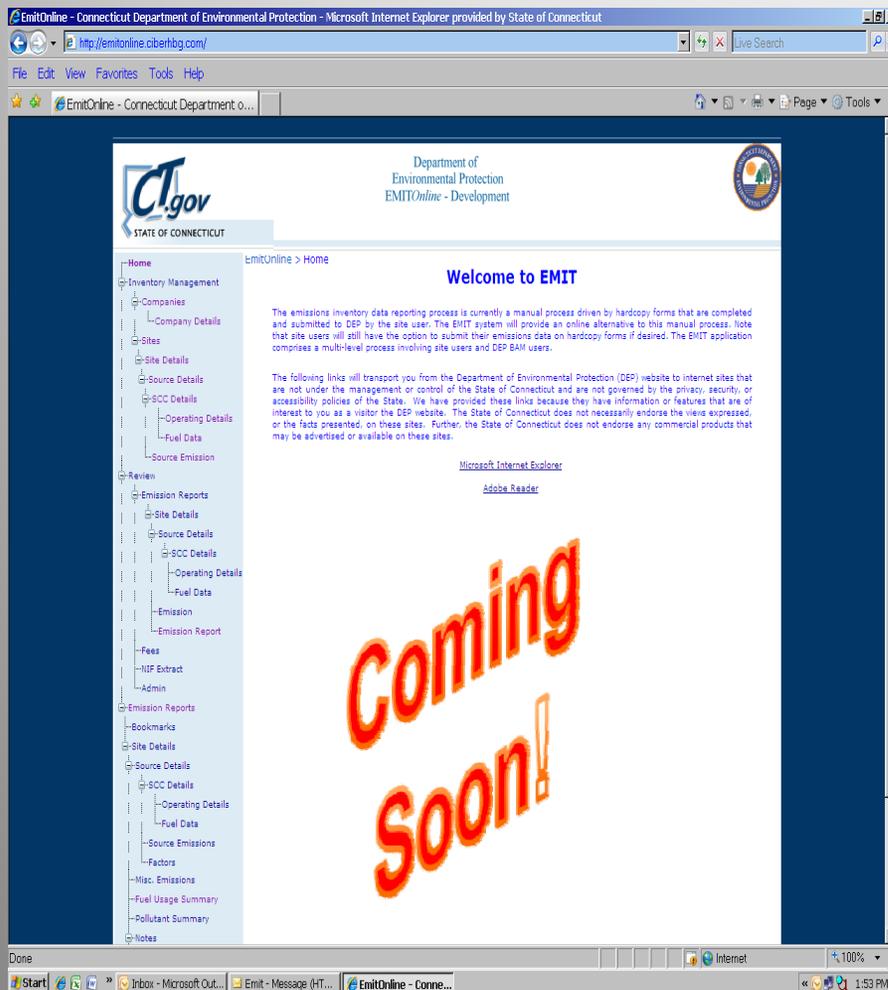
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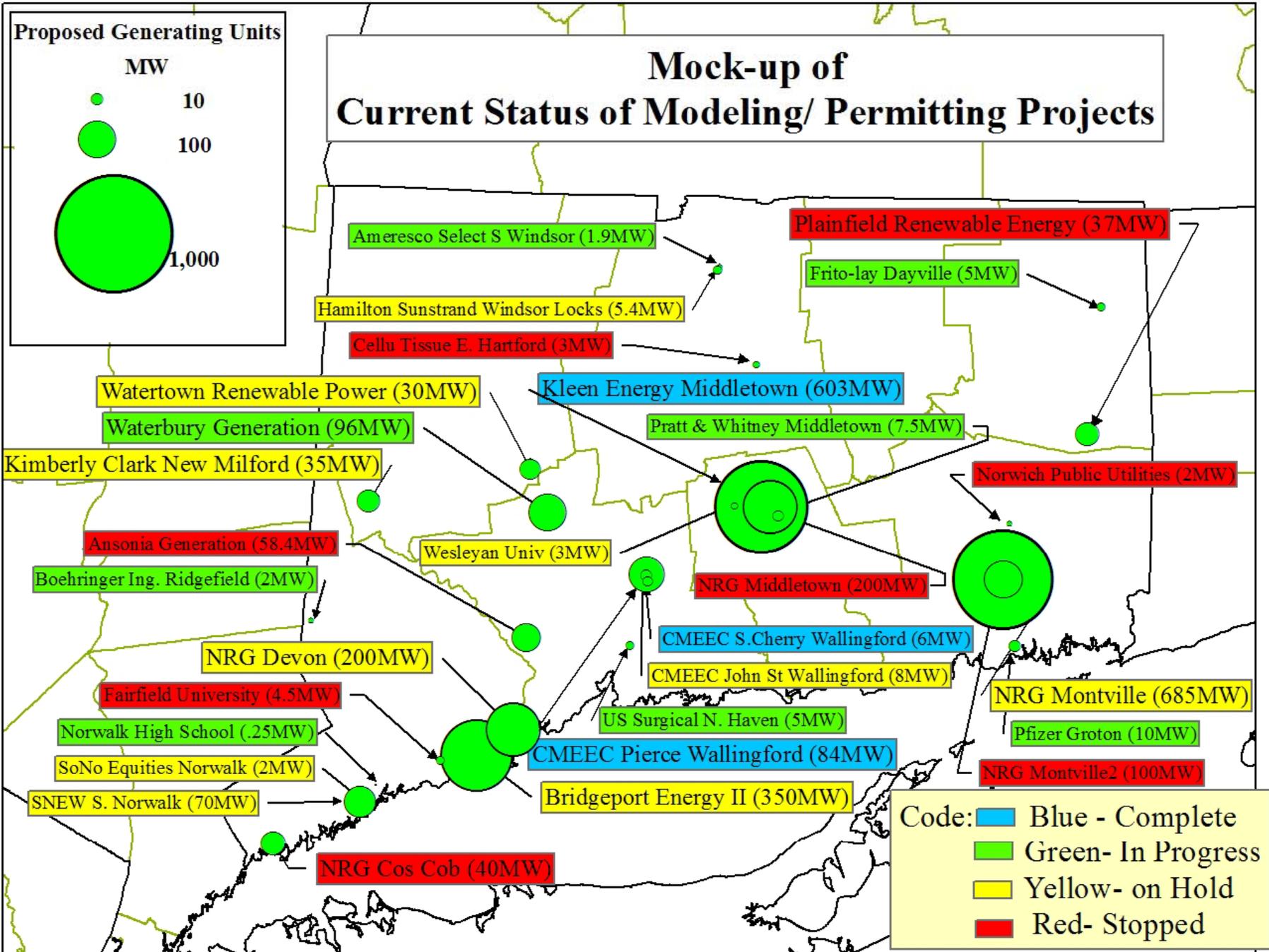
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Mock-up Future Web Site

# Air Pollutant Emissions



- EMIT *On-Line*
  - Streamline, standardize, modernize inventory process.
  - Extracts for modeling.
- New Guidance
- Past Process Streamlining Efforts
  - Small Business Context
  - FAST Vs for Title V
  - Compliance Initiative for Autobody Shops



# Lean Breakthrough

- Enough is Enough, No action = No Success
- Lean tools and techniques are effective
- Creativity before capital
- Learn by Doing
- Engage the organization in the change in culture



Thanks to Charlotte  
and Juliette  
For Coffee, Sweets  
and Fruit



**THANKS  
EVERYONE!**