

Conducting a GHG Emissions Inventory



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ICLEI- Local Governments for Sustainability

Overview of the Day

- **About ICLEI**
- **Why Complete a GHG Inventory?**
- **Introduction to the Local Government Operations Protocol**
- **Data Needs / Data Collection**
- **----10 Minute Break ----**
- **Emissions Calculations in CACP 2009**
- **Hands-on exercise**





About ICLEI



Our mission is to build, serve and drive a movement of local governments to advance deep reductions in greenhouse gas emissions and achieve tangible improvements in local sustainability.



A Worldwide Movement of Local Governments

14 Offices

68 Countries

7 Continents (over 1100 members)

Climate Change Mitigation

Climate Adaptation / Resilience

Sustainability Performance



ICLEI USA Network

- More than 600 member local governments
- Representing more than 25% of U.S. population
- Increasing Regional Focus



How Do Local Governments Benefit from Working with ICLEI?

- National and international network of peers
- Software (emissions analysis, climate planning)
- Guidebooks and Toolkits
- Standard inventory methodology and technical assistance
- ICLEI trainings and events
- Policy and communications assistance
- Framework for approaching climate protection
- Online peer-to-peer and other networking opportunities



ICLEI Five Milestones for Climate Mitigation





Why Complete a GHG Inventory?



Why is a Greenhouse Gas Inventory Important?

- You can't effectively reduce what you don't measure!
- Communities with GHG emissions inventories can:
 - Develop baseline energy/emissions data
 - Create emissions reduction targets
 - Monitor emissions reduction progress
 - Make informed decisions when designing climate / energy programs and climate action plans
 - Be prepared to deal with CEQA and Environmental Review procedures
- Local government policies affect all major sources of greenhouse gas emissions



Climate Action = Fiscal Management



- Chico, CA: In 2008, the City Council approved establishing a GHG reduction target of 25% below 2005 levels by 2020
- Recently installed a 1,107 kilowatt PV system at Water Pollution Control Plant, supplying 40% of the plant's energy needs
- Due to the implementation of the PV system, the city of Chico anticipates an annual savings of \$250,000, a 30-year savings of \$4 million, with the system paying itself off in only 15 years
- The city also expects to save up to \$1 million a year in electricity savings by replacing traffic lights with LED lights



Climate Action = Economic Development

Example: in California AB 32's proposed impact by 2020: *\$74 billion increase in GDP and 89,000 new jobs*

- Green Building
- Renewable Energy
- Energy Efficiency
- Sustainable Agriculture
- Smart Grid
- Local Economy







Introduction to the Local Government Operations Protocol



Types of Inventories

Government



Boundary:
Operational Control

Community



Boundary: Geographic



What is LGO Protocol?

- New standard for local government operations inventories
- Helps create harmonization between GHG inventories reported to multiple programs
- Promotes role of local governments in combating global climate change
- Advances the **consistent, comparable** and relevant quantification of emissions
- Contains recommended data sources, methodologies and reporting guidelines



Protocol Partners



The Climate
Registry



WWW.ICLEIUSA.ORG

Accounting Principles

Based on WRI GHG Protocol



The Greenhouse Gas Protocol Initiative

The foundation for sound and sustainable climate strategies

- Completeness
- Transparency
- Accuracy
- Consistency
- Relevance



GHGs to Include in an Inventory

- Carbon Dioxide (CO₂)
- Methane (CH₄)
- Nitrous Oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF₆)



Scopes Based Accounting

- **Scope 1:** Direct emissions
- **Scope 2:** Indirect emissions from electricity consumption
- **Scope 3:** All other indirect emissions (employee commute, contracted services, upstream emissions)
- **Information Items** (biogenic CO₂, carbon offsets, RECs)



Local Government Inventory

Scope 2



Scope 3



Scope 1



Methods for Computing GHGs from Sources

- Chapters 6 - 12 have both:
- Recommended Methods
- Alternate Methods



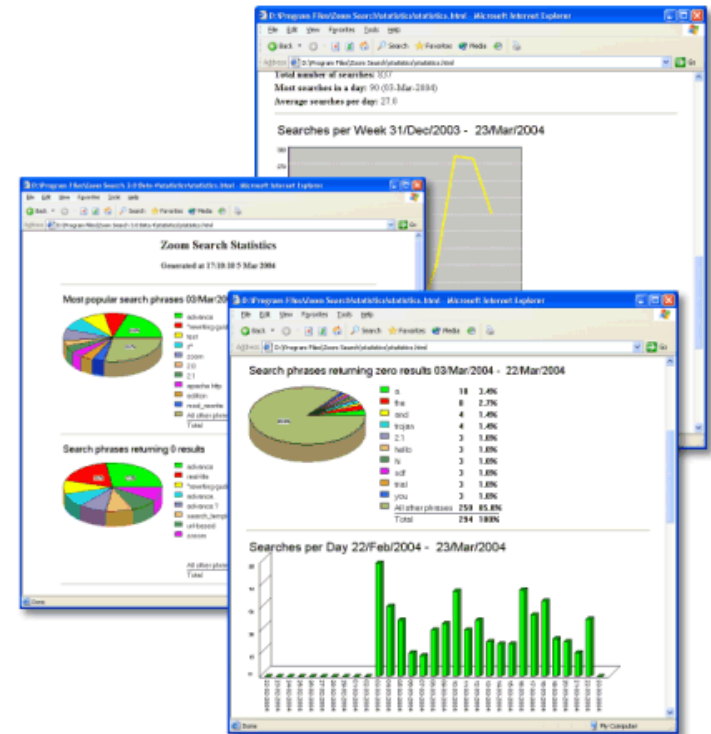
- **ALWAYS** try using the recommended method first



Reporting Emissions Chapter 13

- **Report by Scope: 1, 2, and 3**
 - Scope 1 and 2 required, Scope 3 optional
 - Scopes should NEVER be added in the Chapter 13 report

- **Report by Sectors:**
 - Water Deliver Facilities
 - Wastewater Facilities
 - Ports
 - Airports
 - Buildings and Other Facilities
 - Transit Fleet
 - Vehicle Fleet
 - Streetlights and Traffic Signals
 - Other Process and Fugitive Emissions
 - Employee Commute



ICLEI Reporting Standard

- Required
 - Reporting of all six Kyoto gases
 - All Scope 1 and Scope 2 Sources
 - Reporting by Scope and Sector
 - Reporting of Scope 3 Employee Commute
- Recommended
 - Reporting of government generated waste
 - Reporting of contracted services
 - Activity data disclosure
- Optional
 - Reporting of business travel
 - Other Scope 3 sources
 - Roll-up reporting

Local Government Operations Protocol

Appendix C ICLEI Reporting Requirements
(May 2010)



Highlight – Significance Threshold

To meet ICLEI's Reporting Standard, 95% of all emissions must be quantified using recommended methods and data sources.

Reports with less than 95% recommended methods are still useful and policy-relevant.



ICLEI Roll Up Guidance

- Inventory **MUST** include a chapter 13 report showing emissions by Scope and sector.
- “Roll up” number must be documented as to what sources it includes
- Must include a disclaimer advising that the number may not be comparable to others







Government Operations Inventory: Stationary Sources



Common Stationary Sources

Government Owned/Operated Facilities

- Owned and leased office space
- Police and fire stations
- Recreation centers and facilities, including auditoriums, museums, zoos, other cultural facilities
- Warehouse, fleet and equipment yards, service facilities
- Transportation facilities
- Port and airport facilities and equipment
- Traffic signals, streetlights, utility lighting
- Hospitals and schools
- Courts
- Prisons
- Housing
- Wastewater and potable water conveyance and treatment facilities
- Power generation, transmission and distribution facilities
- Solid waste management facilities, including transfer stations, recycling centers, resource recovery centers, compost facilities and landfills



Data Needs: Buildings

Data Needed

Electricity and fuel usage by fuel type for each building and/or facility



Data Sources

Bills depicting total energy use for each government building and facility:

- Electricity (kWh) (Utility)
- Natural Gas (therms, thousand cubic feet, etc.)(utility)
- Diesel (often for back-up generators – gallons *or* run time and fuel efficiencies)
- Propane and other fuels to generate energy or heat

Total energy costs for each fuel type (optional but useful)

Data may come from: central purchasing, accounts payable, old utility bills, or each individual department



Government Operations Inventory: Mobile Sources



Common Mobile Sources

Government Owned/Operated Fleet Vehicles

- Passenger fleet vehicles
- Light, medium, and heavy-duty trucks
- Police and fire equipment
- Transit vehicles
- Sanitation and street sweeping equipment
- Port and airport on and off-road vehicles
- Aircraft and maritime equipment
- Grounds keeping equipment



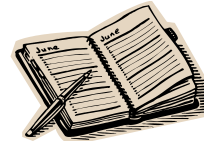
Data Needs: Vehicle Fleet / Transit Fleet

Data Needed

Fuel consumption by fuel type

AND

Annual mileage, vehicle type, model year, fuel type

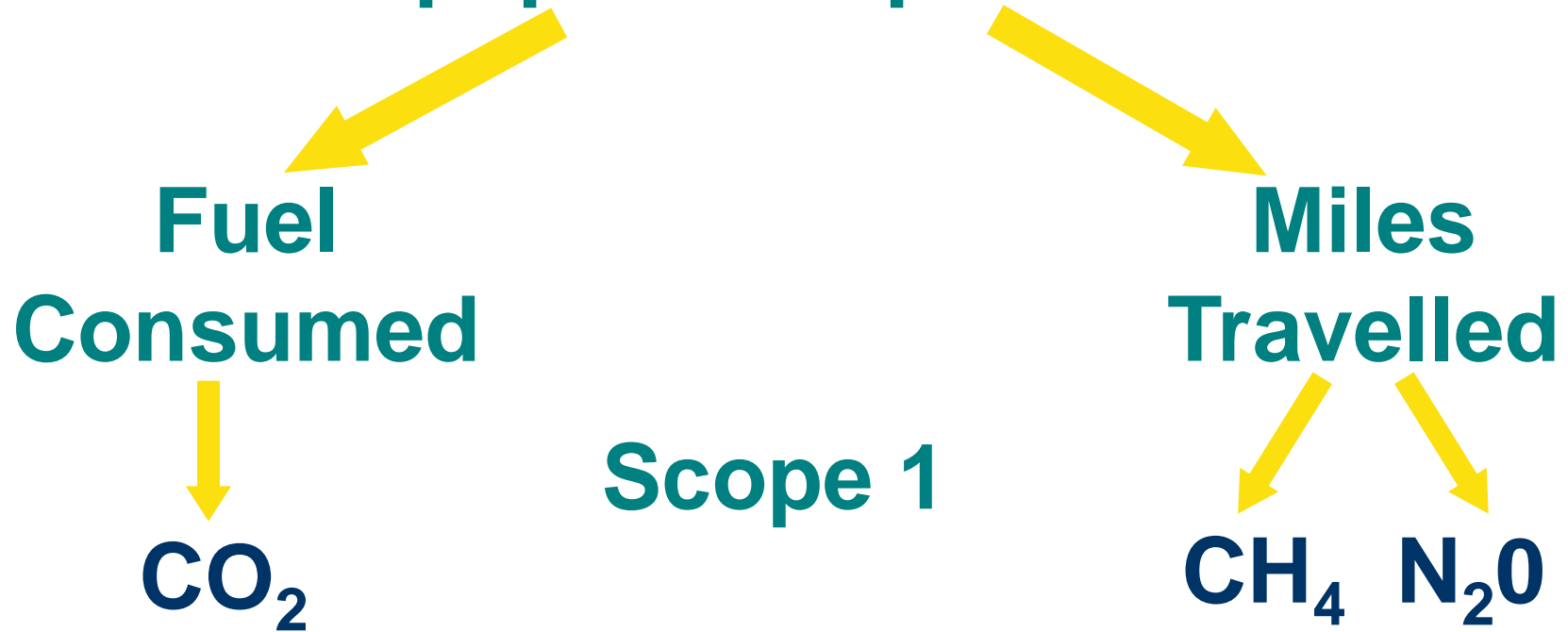


Data Sources

- Fuel usage records (gallons of gasoline and diesel consumed)
- Vehicle tracking log (annual mileage by vehicle type and fuel type, including model year)
- Also want to keep a log of other equipment (weed whackers, lawn mowers, etc.)

Emissions from Mobile Sources

Vehicle Travel or Equipment Operation



Also: Leaked Refrigerants

CO₂ Emissions-Recommended Method

Recommended Method

Data	Scale
Amount and type* of fuel consumed	Vehicle or equipment type and department
Source contact information	N/A

Alternate Method

	RECOMMENDED	ALTERNATE
ACTIVITY DATA	Known fuel use <input checked="" type="checkbox"/>	Fuel estimates based on detailed annual mileage and vehicle fuel economy <input checked="" type="checkbox"/>
		Fuel estimates based on annual mileage and vehicle fuel economy
		Fuel estimates based on dollars spent
		Proxy year fuel use data

* Specify type of fuel (e.g., gasoline, diesel, B50 biofuel) so fossil fuels and biomass of fuels can be reported separately



CH₄/N₂O Emissions- Recommended Method

Required

Data	Scale
Annual vehicle miles traveled	Vehicle type, model year and department
Source contact information	N/A

Alternate Method

	RECOMMENDED	ALTERNATE
ACTIVITY DATA	Annual mileage by vehicle type, model year and fuel type <input checked="" type="checkbox"/>	Fuel use by vehicle type, model year and fuel type <input checked="" type="checkbox"/>
		Annual mileage by vehicle type and fuel type
		Proxy year data





Government Operations Inventory: Refrigerants



Refrigerants and Fire Suppressants

Definition:

- Stationary Leaked Refrigerants and Fire Suppressants
 - HVAC equipment (HFCs-blends)
 - Refrigeration Equipment
 - Fire Extinguishers (CO₂)
 - Fixed Fire Suppression Systems (Halons)
- Vehicle Leaked Refrigerants
 - Air conditioning
- High GWPs – different for each HFC
- Classified as **Scope 1** fugitive emissions



Refrigerants Estimation Methodologies

Stationary

RECOMMENDED	ALTERNATE
Mass balance method <input checked="" type="checkbox"/>	Estimation based on fleet inventory and refrigerants used

Mobile (vehicles)

RECOMMENDED	ALTERNATE
Mass balance method <input checked="" type="checkbox"/>	Simplified mass balance <input checked="" type="checkbox"/>
	Estimations based on equipment inventory and use

- Most challenging part of Protocol
- Likely only takes up 1-2% of total emissions (under the significance threshold)





Government Operations Inventory: Employee Commute



Employee Commute-Introduction

Definition:

- Recommended under ICLEI Reporting Standard
- Employee vehicle travel to-and-from work only (no business travel – can include this separately)
- Classified as **Scope 3** emissions
- Similar methodology as other mobile emissions
- Refrigerants not tracked
- Use hard copy or online survey to gather data



Employee Commute Survey-Data

Emissions

Quantification

(2009 proxy)

- Miles traveled
- Vehicle type
- Vehicle model year
- Fuel type

Indicators

- Commute Cost
- Home City/Town
- Commute Time
- Walking
- Biking
- Transit Use

Policy Development

- Commute preference
- Transit interest
- Policy Options



Government Operations Inventory: Solid Waste and Wastewater



2 Types of Solid Waste Sources



**Government
Generated Waste
(Scope 3)**



**Waste Decomposing
In Landfills
(Scope 1)**



Government Generated Solid Waste Sources

Solid Waste Generated in Government Operations:

- Office Solid waste
- Park and Public Works Green Waste
- Construction and Demolition
- Other Operations Solid Waste



Scope 3 according to LGO Protocol

Solid waste hauler can estimate tonnage or volume



Waste Decomposing in Landfill

Sources: landfills owned or operated by local governments

- Obtain direct measurement data
- Use ICLEI calculator for landfills with partial or comprehensive LFG collection
- Use California Air Resources Board calculator for landfills with no LFG collection



Scope 1 according to LGO Protocol



Wastewater Facilities

Definition:

Process and fugitive emissions from wastewater handling and treatment from:

- Wastewater Treatment Plants
- Septic Tank Networks
- Lagoons

- Obtain direct measurement data
- Use ICLEI Calculator





Government Operations Inventory: Other Sources



Contracted Services

- Types of contracted services vary by local government
- Recommended under ICLEI Reporting Standard
- Scope 3 under the LGO Protocol
- Methods will vary by type of service
- Common sources: waste hauling, HVAC service



Employee Business Travel

- Optional under ICLEI Reporting Standard
- Scope 3 under the LGO Protocol
- Data collection and calculation are similar to that of employee commute





Community Inventory Background



Community-wide Inventory Background

Guiding Protocol: International Emissions Analysis Protocol

- Published by ICLEI Global
- U.S. Community Protocol currently in development

Boundaries

- All emissions sources inside jurisdictional (city or county) boundaries
- Evaluate whether to include regional sources such as aviation, marine, and rail



Scopes Based Accounting

- **Scope 1:** Direct emissions
- **Scope 2:** Indirect emissions from electricity consumption
- **Scope 3:** All other indirect emissions (community generated waste, upstream emissions)
- **Information Items** (biogenic CO₂, carbon offsets, RECs)





Community-wide Inventory Data Needs



Stationary Sources

Data Needed

Electricity and fuel usage by economic sector



Data Sources

Summarized data by sector (Residential, Commercial, Industrial):

- Electricity (kWh) (Utility)
- Natural Gas (therms, thousand cubic feet, etc.) (Utility)
- Direct Access Electricity/Natural Gas (Utility)
- Industrial Fuels (Florida DEP)



On-road Transportation

Data Needed

Vehicle Miles Travelled



Methods and Data Sources

Data-all traffic on roads inside boundaries

- Local Roads
- State Highways

Sources

- State DOT has daily traffic counts by county, city and county road lengths, and GIS data.
- Regional Planning Council may be able to help use GIS data.

Other Sectors

Methods and Data Sources

- Industrial Processes (Florida DEP)
- Landfill Methane (On-site measurements, ICLEI Calculators or ARB First Order of Decay Model)
- Wastewater Treatment (On-site measurements or ICLEI Calculator)







Introduction to CACCP 2009



System to Support
ns Protocol



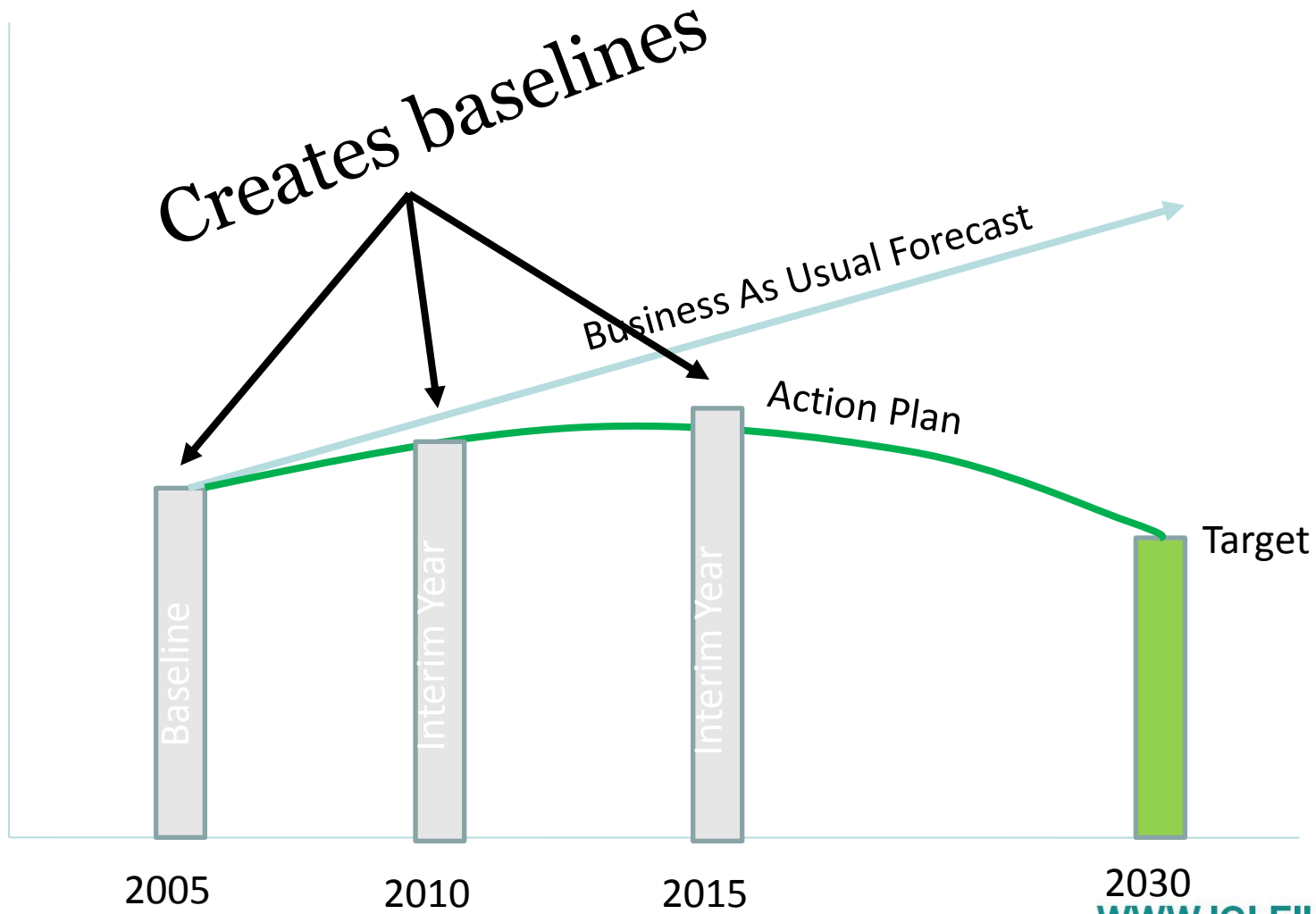
In collaboration with **NACAA**

What can CACP do?

- Emissions inventory
 - Government operations and community
 - Greenhouse gases and criteria air pollutants
- Calculate effects of existing and proposed emissions reduction measures
- Forecast future emission levels
- Track progress toward meeting emission reduction goals

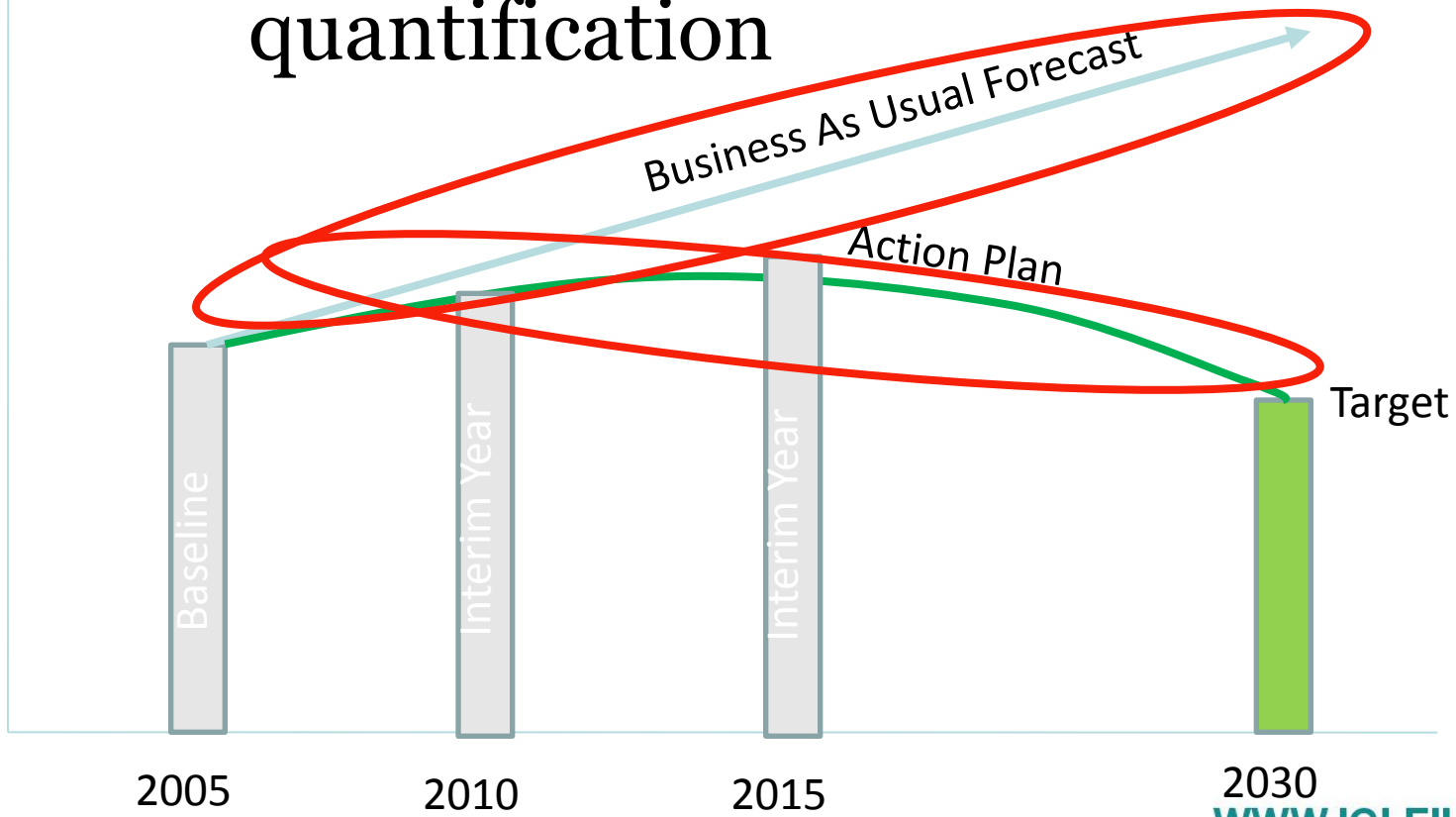


The Role of CACCP 2009 in Reducing Emissions



The Role of CACCP in Reducing Emissions

Assists with forecasting and emissions reduction quantification



Getting Started with CACP 2009

- Install and run software
- Select an inventory year
- Use a utility-specific factor or select an eGRID electricity region
- If eGRID, go to Appendix A of CACP 2009 online User Guide
- Find and then enter your GHG coefficients for CO₂, N₂O, CH₄
- Enter NO_x, SO_x, CO, VOC, PM 10, PM 2.5 coefficients (if you choose to calculate CAPs)



Define Electricity Region

Select an electricity region.

EPA eGRID (enter from LGOP)

The first new Analysis or Measures record you insert will use emission factor sets specific to this region, both for "Grid Average" and for "Grid Marginal" electricity.

Subsequent new records will also continue to use both these sets, at least until you start introducing coefficient sets from other regions into the Analysis or Measures screens.

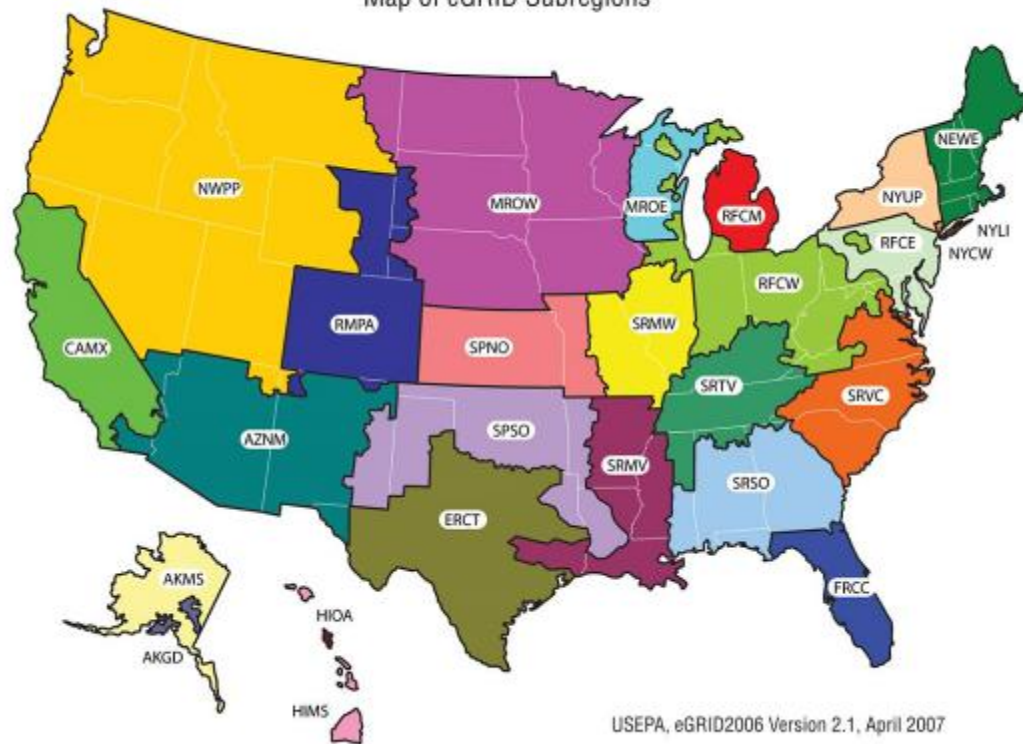
To determine which region you fall into, or for more information on the rules by which newly inserted Analysis and Measures records are assigned coefficient sets, click on Help.

OK

If Using eGRID:

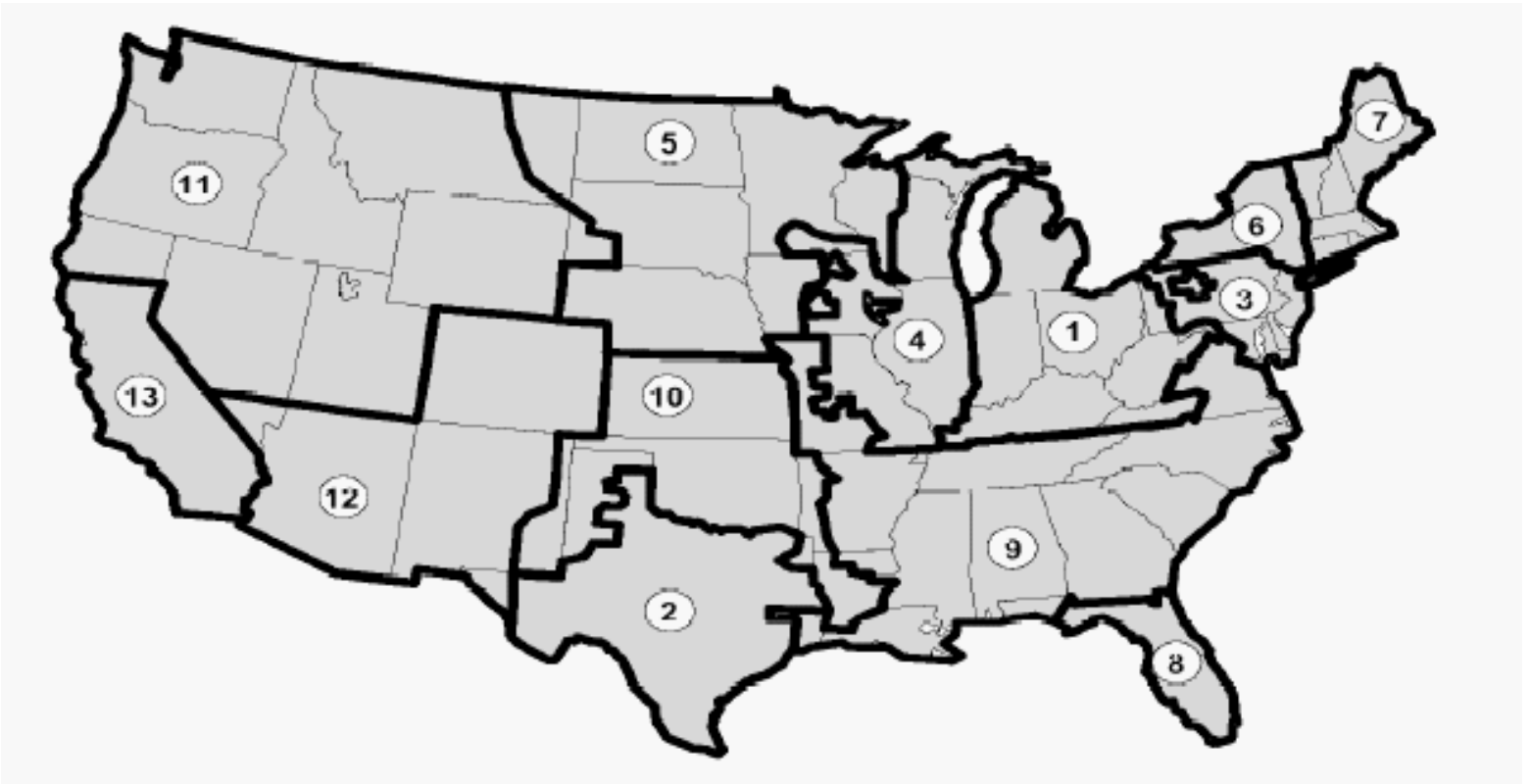
- Select eGRID Region in CACP 2009
- Go to online Appendix A and select region on eGRID Map

Map of eGRID Subregions



NERC Region Map

For CAPs, select NERC Region



eGRID and NERC Tables

From Appendix A of User Guide

Table 1. eGRID Electricity Emissions Factors by eGRID Subregion for Inventory Years 2004 and 2005

Inventory Year		2004			2005		
eGrid Subregion	eGrid Subregion Name	CO ₂ (lb/MWh)	N ₂ O (lb/MWh)	CH ₄ (lb/MWh)	CO ₂ (lb/MWh)	N ₂ O (lb/MWh)	CH ₄ (lb/MWh)
AKGD	ASCC Alaska Grid	1257.188	0.0064	0.0266	1,232.36	0.00651	0.0256
AKMS	ASCC Miscellaneous	480.099	0.0044	0.0239	498.86	0.00408	0.02075
AZMN	WECC Southwest	1254.018	0.0148	0.0175	1,311.05	0.01794	0.01745
CAMX	WECC California	878.707	0.0084	0.0359	724.12	0.00808	0.03024
ERCT	ERCOT All	1420.559	0.0148	0.0214	1,324.35	0.01511	0.01865

Table 3. NERC Electricity Emissions Factors for Criteria Air Pollutants for Inventory Years 1990 – 2005.

Map Number	NERC Region	NO _x (lb/MWh)	SO _x (lb/MWh)	CO (lb/MWh)	VOC (lb/MWh)	PM ₁₀ (lb/MWh)
01	East Central Area Reliability Coordination Agreement					
Inventory Year	1990-2003	5.287	16.573	0.2578	0.0294	0.2445
	2004	3.791	10.187	0.2702	0.0304	0.2385
	2005	3.713	9.660	0.2689	0.0302	0.2338
02	Electric Reliability Council of Texas					
Inventory Year	1990-2003	2.523	3.008	0.5110	0.0582	0.4845
	2004	2.460	2.468	0.5251	0.0591	0.4635
	2005	2.352	2.442	0.5202	0.0585	0.4523

eGRID Coefficient Set in CACP 2009

Region

- EPA eGRID (enter from LGOP)
- Utility Anaheim Public Utilities
- Utility Austin Energy
- Utility City and County of San Francisco

Buttons: Add Region, Delete Region, Restore Defaults

EPA eGRID (enter from LGOP) (lbs/MWh) *Click unit to change.*

Year	CO2	N2O	PM10	PM2.5					
2003	0.0	0.000	0.000	0.000					
2004	0.0	0.000	0.000	0.000					
2005	0.0	0.000	0.000	0.000					
2006	1,324.3	0.015	0.019	2.352	2.442	0.520	0.059	0.452	0.000
2007	0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2008	0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2009	0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2010	1,324.3	0.015	0.019	2.352	2.442	0.520	0.059	0.452	0.000
2011	0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2012	0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2013	0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Buttons: Copy Row, OK, Cancel

Community Analysis Module Structure





Sector Tabs

Government Analysis

Government Measures

Community Analysis for Year 2005

Residential | Commercial | Industrial | Transportation | Waste | Other

Name of Residential Building or Group

Untitled

Record Controls

Insert Select Delete

Report

Record Controls

Fuel Type	Units	Energy Use
Electricity		0
Coal		0
Fuel Oil		0
Kerosene	(US gal)	0
Landfill Gas or biogas	(MMBtu)	0
Natural Gas	(thousand cu ft)	0
Propane	(US gal)	0
Stationary Gasoline	(US gal)	0
Stationary LPG	(US gal)	0
Wood 12 pct moisture	(tons)	0

Assistants Categories Indicators Coefficients

Notes

Coefficient Sets Used by This Group

- Average Grid Electricity Set
- Fuel CO2 Set
- User-Defined Set

View/Edit Contents

Notes Regarding Residential Building or Group Data

Energy Consumption (MMBtu) 0

Equivalent CO₂ Production (tons) 0

NOx Production (lbs) 0

Fuels List

Government Analysis

Government Measures

Community Analysis for Year 2005

Residential | Commercial | Industrial | Transportation | Waste | Other

Name of Residential Building or Group

Untitled

Record Controls

Insert Select Delete

◀ ◀ ▶ ▶

Report

Assistants Categories Indicators Coefficients

- Coefficient Sets Used by This Group**
- Average Grid Electricity Set
 - Marginal Grid Electricity Set
 - Average CHP Heat Set
 - RCI Average Set
 - Fuel CO2 Set
- Defaults Select
- View/Edit Contents
- User-Defined Set

Fuel Type	Units	Energy Use
Electricity (Grid Average)	(kWh)	0
Commercial Coal	(tons)	0
Fuel Oil (#1 2 4)	(US gal)	0
Kerosene	(US gal)	0
Landfill Gas or biogas	(MMBtu)	0
Natural Gas	(thousand cu ft)	0
Propane	(US gal)	0
Stationary Gasoline	(US gal)	0
Stationary LPG	(US gal)	0
Wood 12 pct moisture	(tons)	0

Notes Regarding Residential Building or Group Data

Coefficients Lists and Other Assistants

Energy Consumption (MMBtu) 0

Equivalent CO₂

(lbs) 0

Community Analysis for Year 2005

Residential Commercial Industrial Transportation Waste Other

Name of Residential Building or Group

Untitled

Record Controls

Insert Select Delete

Navigation arrows: back, forward, home, end.

Report

Assistants Categories Indicators Coefficients

Coefficient Sets Used by This Group

- Average Grid Electricity Set
- Marginal Grid Electricity Set
- Average CHP Heat Set
- RCI Average Set
- Fuel CO2 Set

Defaults [Select](#)

[View/Edit Contents](#)

User-Defined Set

Fuel Type	Units	Energy Use
Electricity (Grid Average)	(kWh)	0
Commercial Coal	(tons)	0
Fuel Oil (#1 2 4)	(US gal)	0
Kerosene	(US gal)	0
Landfill Gas or biogas	(MMBtu)	0
Natural Gas	(thousand cu ft)	0
Propane	(US gal)	0
Stationary Gasoline	(US gal)	0
Stationary LPG	(US gal)	0
		0
		0

Output Fields



Summary fields (circled in red):

- Energy Consumption (MMBtu) 0
- Equivalent CO₂ Production (tons) 0
- NO_x Production (lbs) 0

Government Analysis Module



LGO Protocol Reporting Sectors

Clean Air and Climate
File Year Record R
Community Analysis
Government Analysis for Year 2003
Buildings and Facilities Streetlights & Traffic Signals Port Facilities Airport Facilities Water Delivery Facilities Wastewater
Name of Building or Facilities Group
Untitled
Record Controls
Insert Select Delete
Report
Assistants Categories Indicators Coefficients
Coefficient Sets Used by This Group
Average Grid Electricity Set
Marginal Grid Electricity Set
Average CHP Heat Set
RCI Average Set
Fuel CO2 Set
Defaults Select
View/Edit Contents
User-Defined Set
Energy Consumption (MMBtu) 341
Equivalent CO₂ Production (tons) 99
Cost (\$) 0
Notes Regarding Buildings and Other Facilities Data
1/1

Type	Units	Quantity	Energy Cost (\$)
Electricity (Grid Average)	(kWh)	100,000	0
Commercial Coal	(tons)	0	0
Fuel Oil (#1 2 4)	(US gal)	0	0
Propane	(US gal)	0	0
Stationary Gasoline	(US gal)	0	0
Stationary LPG	(US gal)	0	0
Wood 12 pct moisture	(tons)	0	0

Cost Fields →

Measures Modules



Government Measures [Target Year 2010]

Buildings and Facilities Streetlights & Traffic Signals Public Facilities Airport Facilities Water Delivery Facilities Wastewater

Measure Type Record Controls

Energy Efficiency: Buildings

Measure Name

compact fluorescents

Measures Modules

Measure Description, Notes and Assumptions Expand

Report

Calculator

Affected Energy Source 1 Affected Energy Source 2 (Optional)

Location Implementation Data Coefficients

Nil

- Grid Electricity
 - Grid Average
 - Grid Marginal
- Fuel and Electricity Averages

Energy Reduction (kWh) 100,000.0

(\$ per kWh) 0.1

Location of Measure (type in or use list)

Oakland, CA

Energy Reduction (MMBtu)	Equivalent CO ₂ Reduction (tonnes)	Savings (\$)
341	44	10,000

Measure Type / Description

Government Measures [Target Year 2010]

Buildings and Facilities | Streetlights & Traffic Signals | Port Facilities | Airport Facilities | Water Delivery Facilities | Wastewater

Measure Type
Energy Efficiency: Buildings

Measure Name
compact fluorescents

Measure Description, Notes and Assumptions
Expand

Record Controls

Insert Select Delete

Report

Calculator

Affected Energy Source 1 | Affected Energy Source 2 (Optional)

Nil

- Grid Electricity
 - Grid Average
 - Grid Marginal
- Fuel and Electricity Averages

Energy Reduction (kWh)

100,000.0

(\$ per kWh)

0.1

Location | Implementation Data | Coefficients

Location of Measure (type in or use list)

Oakland, CA

Energy Reduction (MMBtu)

341

Equiva

Initial and Replacement Energy Source

Government Measures [Target Year 2010]

Buildings and Facilities Streetlights & Traffic Signals Port Facilities Airport Facilities Water Delivery Facilities Wastewater

Measure Type Energy Efficiency: Buildings

Measure Name compact fluorescents

Measure Description, Notes and Assumptions Expand

Affected Energy Source 1 Affected Energy Source 2 (Optional)

Nil Grid Electricity Grid Average Grid Marginal Fuel and Electricity Averages

Energy Reduction (kWh) 100,000.0

(\$ per kWh)

Location Implementation Data Coefficients

Location of Measure (type in or use list) Oakland, CA

Outputs

Energy Reduction (MMBtu) 341 Equivalent CO₂ Reduction (tonnes) 44 Savings (\$) 10,000

Energy Reduction	(MMBtu)	341	Equivalent CO ₂ Reduction	(tonnes)	44	Savings	(\$)	10,000
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What Does CACP 2009 Not Cover?

- N_2O and CH_4 wastewater emissions
- CH_4 waste emissions (waste in place)

ICLEI has created supplemental calculators to quantify emissions from waste and wastewater. The resulting amounts of CH_4 and N_2O are added in CACP like any other fuel.



Reporting Waste & Wastewater Emissions in CACP 2009

- Use Nitrous Oxide and Methane Fuel Types

Clean Air and Climate Protection 2009 Software ©

File Year Record Report Assistants Settings Help

Community Analysis Community Measures Government Analysis Government Measures

Government Analysis for Year 2005

Port Facilities Airport Facilities Water Delivery Facilities **Wastewater Facilities** Solid Waste Facilities Vehicle Fleet Em

Name of Wastewater Group: Untitled

Record Controls: Insert Select Delete

Report

Assistants Categories Indicators Coefficients

Forecast Builder

Type	Units	Quantity	Energy Cost (\$)
Landfill Gas or biogas	(MMBtu)	0	0
Natural Gas	(thousand cu ft)	0	0
Propane	(US gal)	0	0
Stationary Gasoline	(US gal)	0	0
Stationary LPG	(US gal)	0	0
Wood 12 pct moisture	(tons)	0	0
Carbon dioxide	(tonnes CO2)	0	0
Methane	(lbs CH4)	0	0
Nitrous Oxide	(lbs N2O)	0	0
Sulphur Hexafluoride	(lbs SF6)	0	0

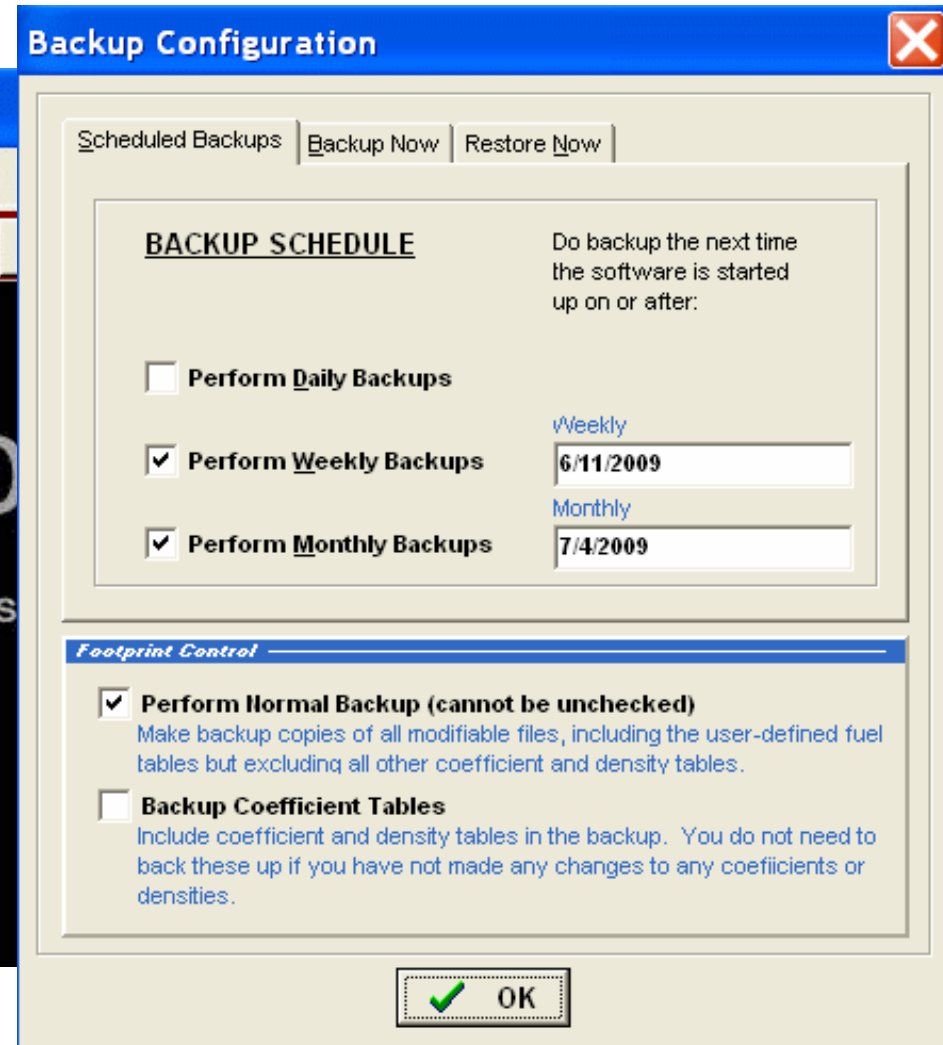
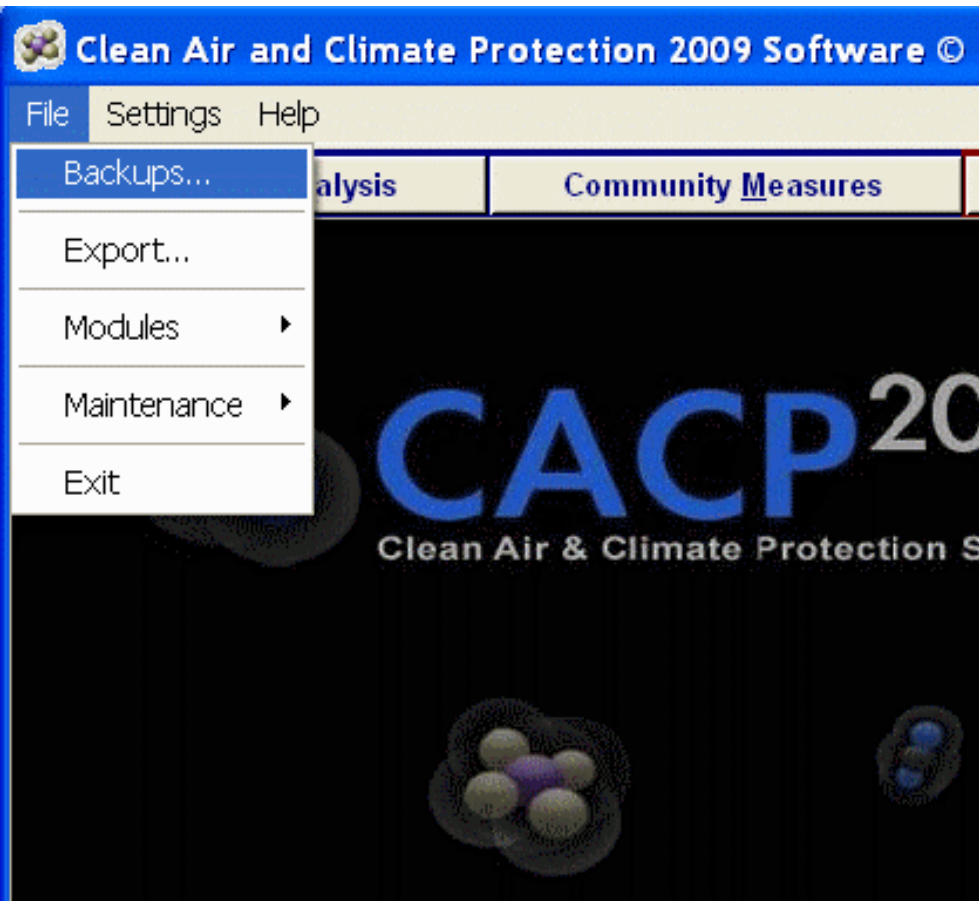
Notes Regarding Wastewater



Other Basic Functions



Saving Data - Backups



Additional Resources



Where to Find Tools



You are here: Home → Action Center

Xico Manarolla : preferences undo log out

ICLEI Data Collect

Attention ICLEI members: If you a forms, please e-mail Xico Manaro technical issue and are working to

- Getting Started
- Planning
- Financing & Staffing
- Skills Training
- Engaging Your Community
- Media Support
- Affecting Policy
- Tools**
- Learn From Others
- General Resources

... downloading these data collection to you directly. We apologize for this

Action Center

- Getting Started
- Planning
- Financing & Staffing
- Skills Training
- Engaging Your Community
- Media Support
- Affecting Policy

<http://www.icleiusa.org/action-center/tools/iclei-data-collection-tools>



CACP 2009 Website

<http://www.icleiusa.org/action-center/tools/cacp-software>

The screenshot shows the ICLEI USA website interface. At the top left is the ICLEI logo with the text "Local Governments for Sustainability USA". To the right is a navigation bar with links for "ICLEI Worldwide", "FAQ", "Newsletter", and "Press Room". A search bar is also present. Below the navigation is a banner image of a city skyline with the text "Local Action Moves the World". A horizontal menu contains links for "About ICLEI", "Programs", "Action Center", "Success Stories", "News & Events", "Blog", and "login". Below the menu is a breadcrumb trail: "You are here: Home → Action Center → Tools → CACP Software 2009". The main content area features the title "CACP Software 2009" and a large graphic with the text "CACP 2009 Clean Air & Climate Protection Software". To the right of the main content is a sidebar with a yellow "Join ICLEI" button and a list of links under the heading "Action Center": "Getting Started", "Planning", "Tools", "CACP Software 2009", "Eligible Recipients", "FAQ on CACP 2009", "Support Services", and "Contact".

- ICLEI members can download the software
- Non-members can register

CACP 2009 Help

Sustainability & Climate Forums

by [ICLEI USA Admin](#) — last modified September 16, 2010 1:46 AM



CACP 2009 Resources

- **User Guide:** Learn how to install and use the software
- **FAQ:** Get answers to your basic questions.
- **GHG Inventories/CACP Software 2009 Member Forum:** Ask and answer questions about your local government inventory or using CACP 2009.
- **E-mail us:** For specific questions to ICLEI's Technical Team, e-mail cacp-software@iclei.org.

Five Milestone Process

Forum name	Conversations	Most recent comment
Getting Started A place for newcomers to ask questions and share experiences on climate-, energy-, and sustainability-related topics such as building support, funding, finding resources, program organization, quick wins	0	No conversations started
Measuring & Managing Performance Greenhouse gas emissions inventories, energy/fuel consumption, CACP Software, assessing community sustainability, climate resiliency studies, data collection, reporting (Milestones One & Five)	22	by Darryn Burich September 04, 2010
Planning GHG target setting; climate action plans, energy plans, sustainability plans, comprehensive plans, climate adaptation plans, transportation plans (Milestones Two & Three)	0	No conversations started
Implementation Project management, program & policy design, financing & staffing (Milestone Four)	0	No conversations started



Thank You!

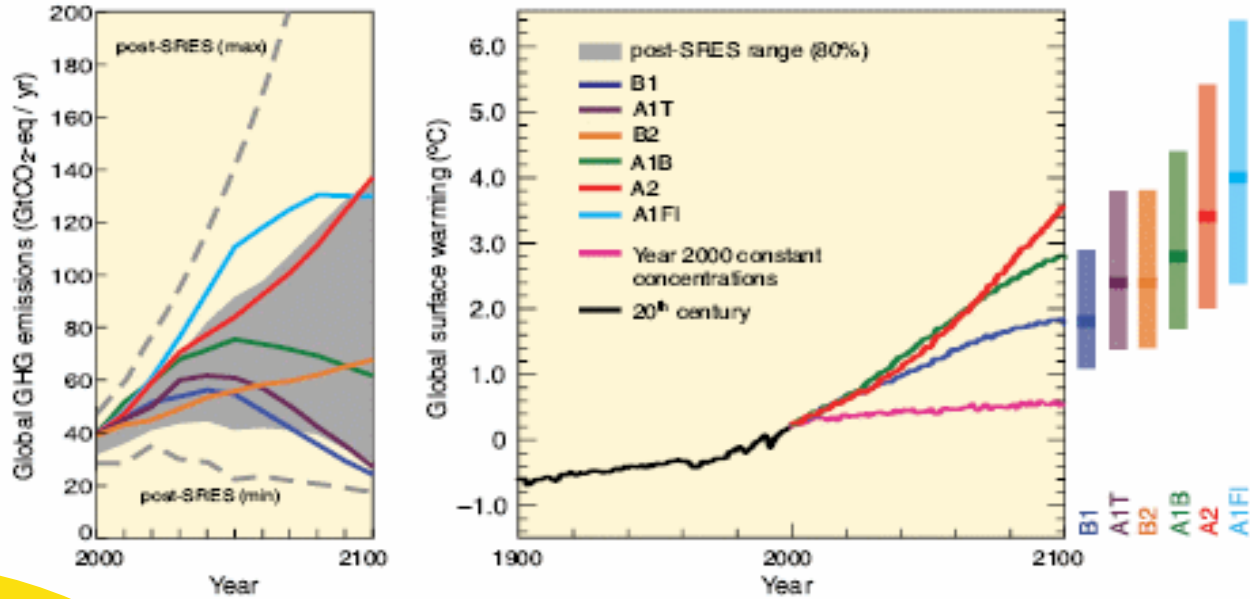


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Scenarios for GHG emissions from 2000 to 2100 (in the absence of additional climate policies) and projections of surface temperatures



Forecasting



Forecasting Background

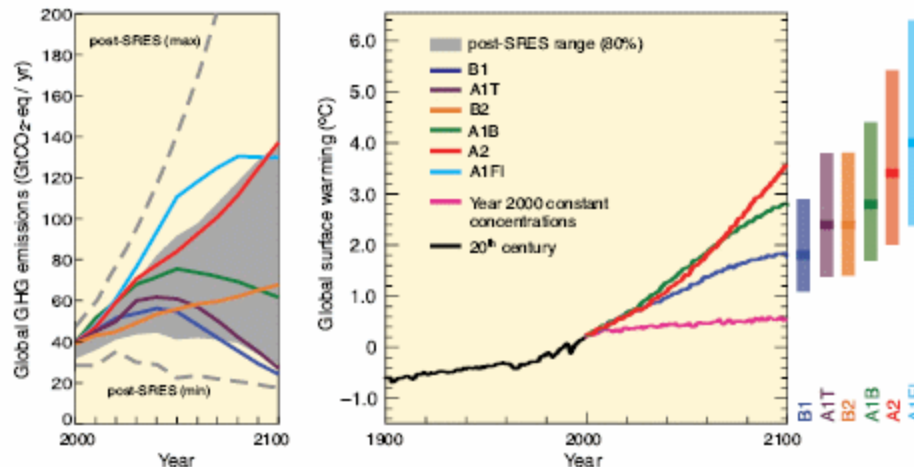
- No standard protocol for emissions forecast yet
- ICLEI guidance on forecasting in December 2010
- ICLEI currently has best practice guidance based on years of experience



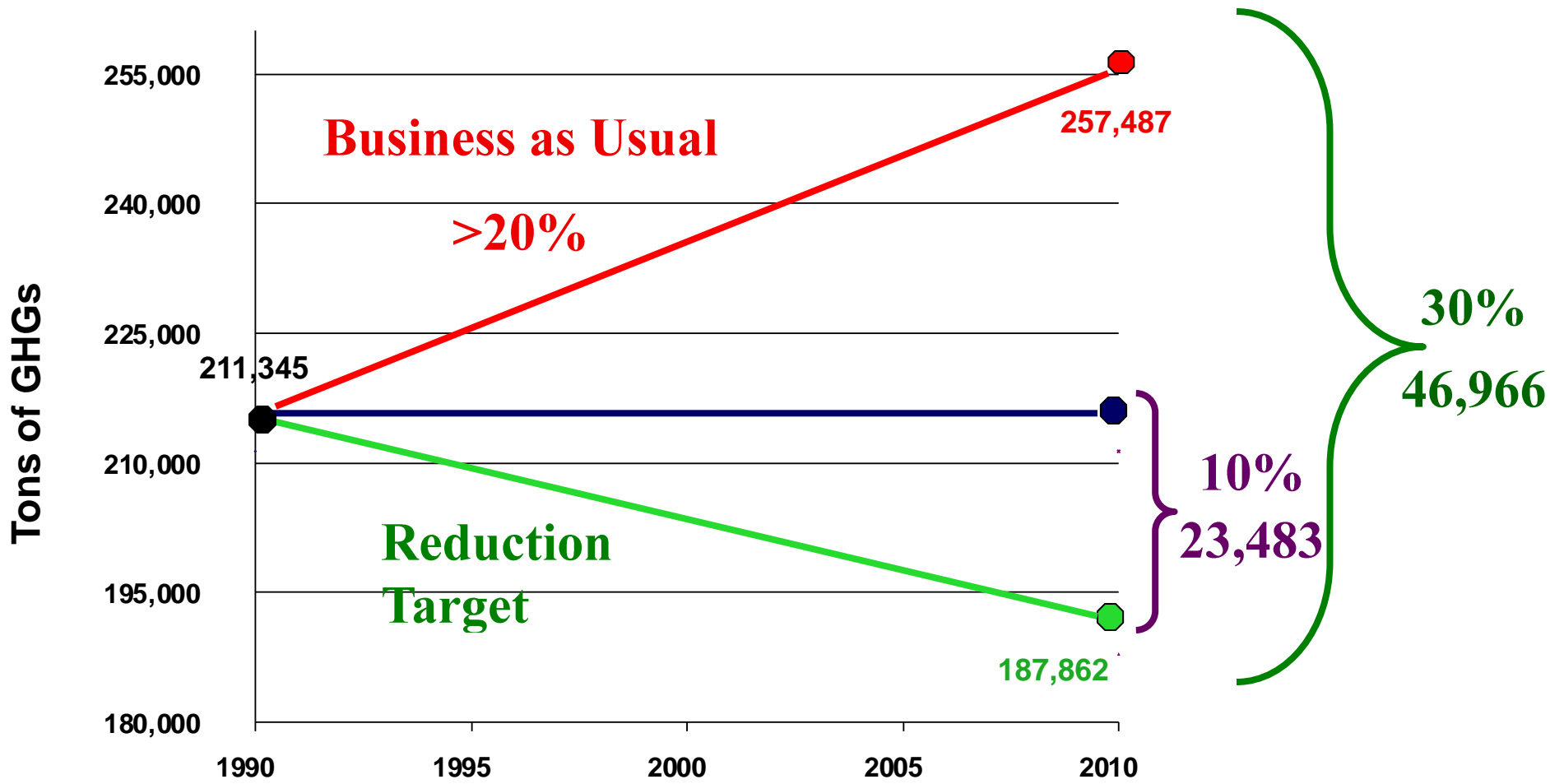
Why Forecast?

- Important for target setting and knowing how much to reduce your emissions by
- To meet scientific imperative of reducing 80% from 1990 emissions by 2050, you may need to do a backcast

Scenarios for GHG emissions from 2000 to 2100 (in the absence of additional climate policies) and projections of surface temperatures



Forecasting and Target Setting



Best Practices for Forecasting

- Do a Business As Usual (BAU) Forecast by sector
 - Use the same emissions factors (particularly for electricity) as your base year
- Use multiple inventory years to create trend lines
- Find key indicators to help make determinations about the past or future
 - For community: population
 - For government: FTE



Then ...

Implement greenhouse gas emission reduction strategies!



Questions?

