



## South Africa CCP Network Training

### Harmonised Emissions Analysis Tool HEAT



Cape Town, South Africa



## What is new in CCP South Africa?

- Cities undertook CCP Milestone processes and have moved to specific areas for measure implementation (i.e. Transportation)
- New CCP participant cities
- National Air Quality Management Act, 2004
- Limited use of CCP South African edition Software





## CCP Software

- ✓ Emission inventory and forecast
- ✓ Set reduction targets
- ✓ Develop a quantified action plan
- ✓ Implement action plan
- ✓ Monitor and verify results

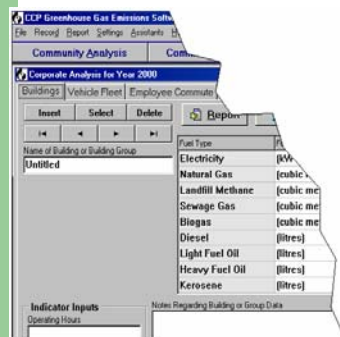
CCP software supports first three milestones

450+ users internationally



## Limitations of existing software...

### CCP Software



- Only quantifies GHGs
- Only in English & Spanish
- Separate versions for countries: hard to manage
- Expensive to maintain and upgrade
- Not available over the internet
- Difficult to work over local networks





## What we needed to do...

- Add air pollutants emissions
- Make software internet based
- Expand audience for the software
- Develop multi-lingual interfaces
- Implement country-specific data
- Forge partnerships with stakeholders



## With support from USAID ...

- Mexico and Philippines, 1999
- India and Indonesia, 2001
- South Africa, 2001
- HEAT software development, 2004
  - India, Indonesia, South Africa and Brazil



## and HEAT's Global Partners

### Country Data Developers

- Bandung Institute of Technology: Indonesia
- Bajaj Auto: India
- University of Cape Town: South Africa
- CETESB, FEEMA: Brazil



## HEAT @ [www.icleiheat.org](http://www.icleiheat.org)



The screenshot displays the HEAT web application interface. It includes a navigation menu with options like 'HOME', 'ABOUT HEAT', 'CONTACT', and 'HELP'. The main content area is divided into several sections:

- Project Information:** Includes fields for Name (Energy eff. activity), Measure Type (Energy Efficiency: Buildings), Internal Load (4000), Total Load (90000), Implementation Phase (Pilot), Implementation Period (2000), Creditable Period (4), Annual Measurement Savings (9000), and External Load (30000).
- Contact Information:** Includes fields for Email, Phone, Organization, Title, and Name.
- Input:** Includes Affected Energy Source (Electricity) and Fuel use (40,000 US gal gasoline eq).
- Output:** A table showing CO2 Emissions (6,400 tons), CH4 (26 tons), and N2O (26 tons).
- LEAP Emissions:** A table showing emissions for PM10, SO2, NOx, HAP, CO, CO2, and PM2.5, all measured in tons.
- Other:** Includes Savings (0 tons), Maximum CO2 Reduction (3,476 tons), and Energy Intensity (32,422 US gal gasoline eq).

“Towards harmonised air emissions and climate action planning”





## What is HEAT?

- Planning tool GHG emissions & air pollutants
- Uses standard IPCC Methodology and advanced EPA models
- Multi-lingual - all languages possible
- Contains country specific emission factors (if available)



## What is HEAT? Cont....

- Online global database of emissions and action plans: you won't lose your data
- Possible to use stand alone version
- Multi users: various City departments can work on it
- Users get an account

**Easy to Use!**



## Tracked Emissions

- GHG Emissions:  
CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>, HFCs, FCs
- Air Pollutants:  
NO<sub>x</sub>, SO<sub>x</sub>, CO, VOCs, HC, TP, PM<sub>10</sub>, PM<sub>2.5</sub>



ICLEI - Mozilla Firefox  
File Edit View Go Bookmarks Tools Help  
http://www.icleiheat.org:8080/ICLEIHEAT/portal/main.jsp

**ICLEI**  
Local Governments for Sustainability

- HOME
- NEWS
- ANNOUNCEMENTS

**MEMBER ACCESS**

UserID   
Password   
[Sign In](#)

**GUEST ACCESS**

[Choose Country]   
[Choose Language]   
[Sign In](#) [Calculators](#)

**REGISTRATION**

Click here to register yourself for accessing HEAT Application.

**'HARMONIZED EMISSIONS ANALYSIS TOOL (HEAT)'**

**ICLEI - Local Governments for Sustainability**, is an organization of local governments that support environmental programs for local governments. ICLEI is planning to develop a software solution to support its greenhouse gas and air pollution emission reduction programs. This software will assist local governments in developing emissions inventories and making action plans to reduce emissions. It will be a database tool that will track multiple records of energy and emissions data, as well as multiple records of emission reduction activities.

In general the software will:

- ◆ Build an emissions inventory (by having users enter data records of energy use that are translated into emissions by the software)
- ◆ Conduct a simple forecast with user-input parameters
- ◆ Set a target/goal for reducing emissions (e.g., reduce GHG emissions by 10%)
- ◆ Quantify emission reduction activities
- ◆ Develop and report an emissions reduction action plan, which consists of a series of quantified measures designed to meet the reduction target. The reporting should show progress towards meeting a target.

**NEWS**

*International Data Partners Confirmed.....* [more](#)

**ANNOUNCEMENTS**

*HEAT prototype is Running, May 28th...* [more](#)

*August 3rd: HEAT Demonstration at USAID in Washington...* [more](#)

© ICLEI 2005

Done



## Launch HEAT

- Point your browser to the HEAT portal, <http://www.icleiheat.org/>
- Type in your UserID and password
- Click Sign In
- After the screen refreshes, click on Launch HEAT Tool
- HEAT will take you to the [Account Summary](#)



http://www.icleiheat.org:8080 - ICLEI - HEAT - Mozilla Firefox

**ICLEI** Local Governments for Sustainability

Welcome, Bob Price  
3<sup>rd</sup> August 2005  
Berkeley, South Africa

HOME INVENTORY MEASURES REPORTS DATA SETS PREFERENCES

Go To Account Summary HELP EXIT

Welcome Bob Price ,

### Inventory Summary

Community :total number of records 7 for year 2010

	Count	eCO2 Production(in tons)
♦ Transportation	2	322
♦ Residential	5	289

Government :total number of records 0 for year 2010

### Measures Summary

Community :total number of measures 2

	Count	eCO2 Production(in tons) 2010
♦ Residential	2	4

Government :total number of measures 0

### Action Plan Summary

Community		Set Community Targets	Government		Set Government Targets
Baseline Year :		2000	Baseline Year :		1990
Forecast Year :		2010	Forecast Year :		2010
<b>Climate Action Plan</b>	eCO2	in (tonnes)	<b>Climate Action Plan</b>	eCO2	in (tonnes)
Baseline year Emissions :		610	Baseline year Emissions :		0
Forecast year Emissions :		611	Forecast year Emissions :		0
Target Emission Level :		549	Target Emission Level :		0
Reduction Target :		10.0 %	Reduction Target :		20.0 %
Reductions Required:		62	Reductions Required:		0
Reductions Currently Planned :		4	Reductions Currently Planned :		0
Amount Remaining To Be Planned :		58	Amount Remaining To Be Planned :		0

Done



## Inventory Summary

Inventory Summary			
<b>Community</b> :total number of records <b>7</b> for year		2010	
	Count	eCO <sub>2</sub> Production (in tons)	
♦ Transportation	2	322	
♦ Residential	5	289	
<b>Government</b> :total number of records <b>0</b> for year		2010	



## Measures Summary

Measures Summary		
<b>Community</b> :total number of measures <b>2</b>		
	Count	eCO <sub>2</sub> Production (in tons) <b>2010</b>
♦ Residential	2	4
<b>Government</b> :total number of measures <b>0</b>		







## Action Plan Summary

Action Plan Summary			
<b>Community</b>		<a href="#">Set Community Targets</a>	
Baseline Year :	2000		
Forecast Year :	2010		
<b>Climate Action Plan</b>	eCO2	in	(tonnes)
Baseline year Emissions :	610		
Forecast year Emissions :	611		
Target Emission Level :	549		
Reduction Target :	10.0 %		
Reductions Required:	62		
Reductions Currently Planned :	4		
Amount Remaining To Be Planned :	58		
<b>Government</b>		<a href="#">Set Government Targets</a>	
Baseline Year :	1990		
Forecast Year :	2010		
<b>Climate Action Plan</b>	eCO2	in	(tonnes)
Baseline year Emissions :	0		
Forecast year Emissions :	0		
Target Emission Level :	0		
Reduction Target :	20.0 %		
Reductions Required:	0		
Reductions Currently Planned :	0		
Amount Remaining To Be Planned :	0		



## Settings & Targets

http://www.icleiheat.org:8080 - ICLEI - HEAT - ...

COMMUNITYTARGET SETTINGS

Base Year: 1990

Target Year: 2010

Target Reduction (%): 15.0

UPDATE CLOSE

Done

Under Tools





# Reports

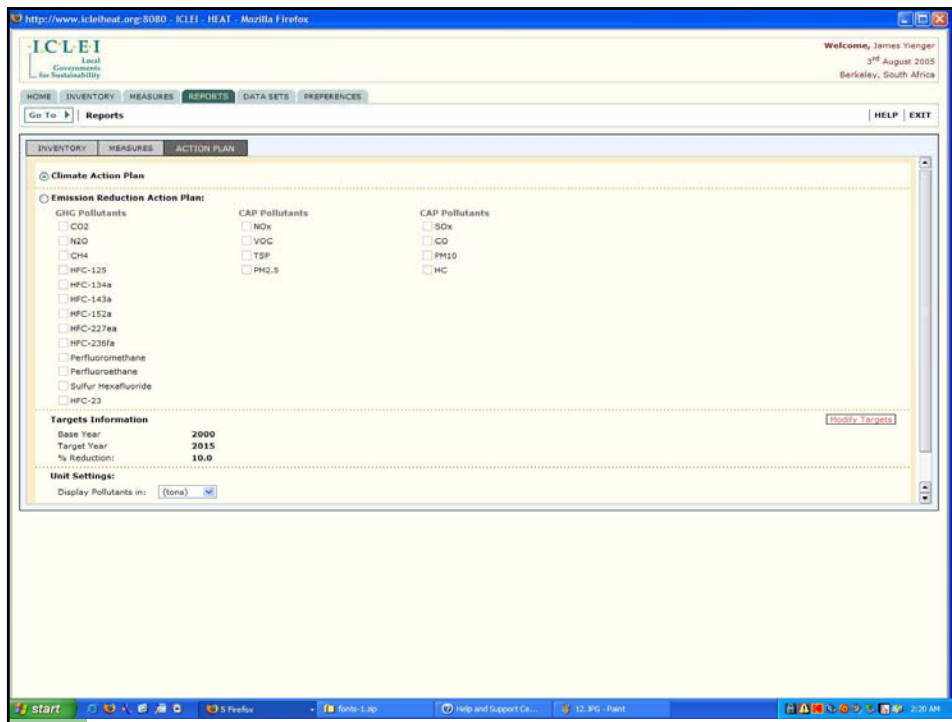
- Inventory Reports
- Measure Reports
- Action Plan Reports



The screenshot displays the ICLEI HEAT web application interface. At the top, there is a navigation bar with the ICLEI logo and the text "Local Governments for Sustainability". A user greeting "Welcome, James Yienger" and the date "3<sup>rd</sup> August 2009" are visible in the top right corner. The main navigation menu includes "HOME", "INVENTORY", "MEASURES", "REPORTS", "DATA SETS", and "PREFERENCES". The "REPORTS" section is active, showing sub-tabs for "INVENTORY", "MEASURES", and "ACTION PLAN".

The "Detailed Report" section is expanded, showing options for "summary" and "Detailed". Under "Custom Reports", there are "Primary Sorting options" (Sector) and "Sub-level Sorting options" (Sub-level 1, Sub-level 2, Sub-level 3). The "Time Series" section allows selecting the number of years in the series and entering year values. The "Pollutant Settings" section includes "Show Pollutants" (GHG, CAP, Both) and "Report Year" (1990). The "Unit Settings" section includes "Display GHG Pollutants in:" (tons), "Display CAP Pollutants in:" (tons), and "Display Energies in:" (liters gasoline eq).

Buttons for "Reset" and "Generate" are located at the bottom of the report configuration area. The browser's address bar shows "http://www.icleiheat.org:8080 - ICLEI - HEAT - Mozilla Firefox". The Windows taskbar at the bottom shows the start button, Firefox, Retro-Lab, Help and Support Ce..., and LL3PG - Paint, with a system clock showing 2:19 AM.



## Data Sets

- View Emission Factor Tree
- View Emission Factor Values
- Modify Default Trees



http://www.icleilocal.org:8080 - ICLEI - HEAT - Mozilla Firefox

Welcome, James Vienger  
3<sup>rd</sup> August 2005  
Berkeley, South Africa

HOME | INVENTORY | MEASURES | REPORTS | DATA SETS | PREFERENCES

Go To Data Sets | HELP | EXIT

EMISSION FACTORS ENERGY DENSITIES

Note: This section will assist you in viewing emission factor values for available trees and modification emission factor values of 3 trees modifiable tree.

Select any tree branch with end points

View Emission Factors for Commercial

Stationary

- test with regions
- Stationary Test
- Direct emission sources
- South African Stationary
- Residential
- Commercial**
  - Propane
  - Natural gas
  - Average Coal
  - Fuel oil
- Industrial
- Mobile


Currently viewing default Emission Factor values for "South African Stationary" tree

Tree Name : South African Stationary  
Details: Commercial

Emission Factors Units: (kg) per (GJ)

	CO2	CH4	N2O	NOx	SOx	VOC	CO	TSP	PM10	PM2.5
Fuel oil	300.0	3.0	4.0	5.0	4.0	5.0	3.0	4.0	3.0	2.0
Average coal	330.0	4.0	3.0	5.0	4.0	2.0	3.0	2.0	1.0	0.0
Natural gas	259.0	2.0	3.0	2.0	4.0	5.0	3.0	5.0	6.0	7.0
Propane	499.0	3.0	4.0	3.0	5.0	6.0	7.0	7.0	5.0	3.0

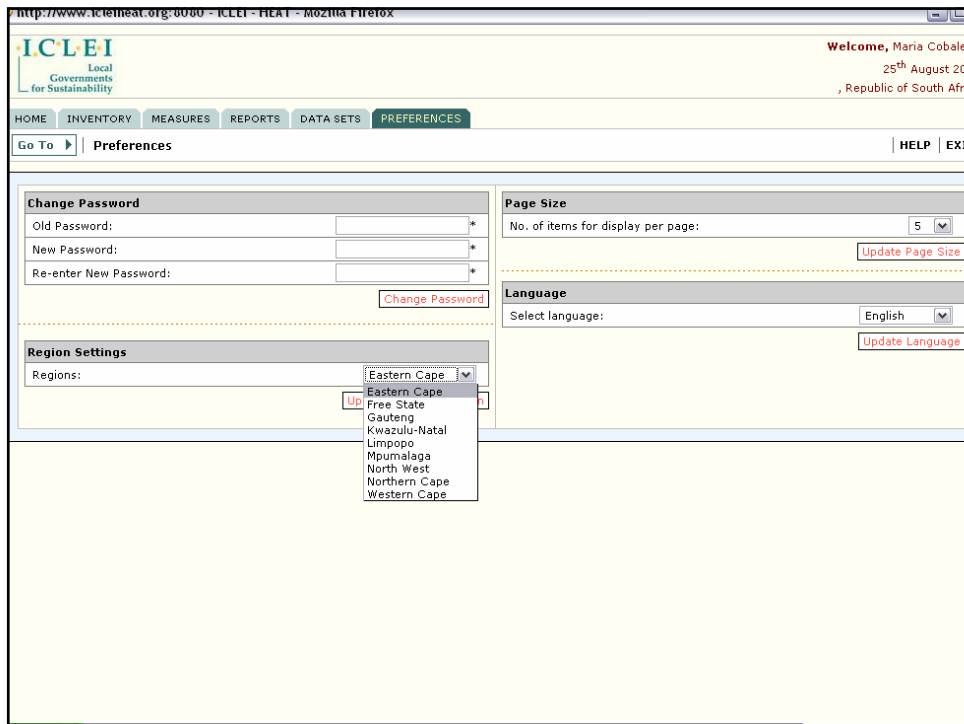

start Firefox - Rute-Lab Help and Support Co... 88.JPG - Paint 2:10 AM



## Preferences

- Account Management
- Change Password
- Set specific Region
- Set preferred language

ICLEI  
Local Governments for Sustainability





## How HEAT works: Calculators

- Calculators contain the algorithms for quantification
- Basic Algorithm for Inventory:
 
$$\text{Emissions} = \text{EF} \times \text{Activity}$$

Where,

  - Activity is energy use, waste, and transportation data supplied by user, and
  - EF is the emission factor





## Emission Factors: Country specific

- In the case of energy use in residential, commercial, industrial and transportation sector:

$$EF = F \text{ (fuel characteristics, technology)}$$

- In the case of waste sector:

$$EF = F \text{ (type waste, type of practice)}$$



## Data Sets: Emission Factor Trees

Emissions factor set forms a “tree”





## Typical Data Sets

- Stationary
  - National average
  - Sector based
- Mobile
  - Fleet average (by year)
  - Alternative fuels
- Electricity, average
- Waste, by method



## More Calculators

- Calculators to compute emission mitigation options
  - Energy efficiency
  - Landfill gas capture and use
  - Fleet fuel switch
  - Installing renewable energy



## Advance quantification tools

HEAT can be customized to have:

- Calculators designed with CDM approved methodologies
- Calculators with specific models
  - Carbon Asset Accounting
  - Land use/carbon stock
  - Sustainability indicators
  - Vulnerability/Adaptation tools