
11th Annual Emission Inventory Conference
April 16, 2002

Susann Nordrum
ChevronTexaco Energy and Greenhouse Gas Inventory Project: CEGIS

- CEGIS Development
- Scope
- Boundaries/Accuracy
- Verifiability
- Next Steps
CEGIS Development

- ChevronTexaco Project Development and Execution Process (CPDEP)
  1. Define the Opportunity
  2. Generate and Select Alternative(s)
  3. Develop Alternative
  4. Execute
  5. Operate and Evaluate
CTPDEP Phase 1: Define Opportunity

- CPDEP Process/Roadmap/Team/DRB
- Hired ADL/PwC/Energetics to help us build a new system
  - Inventory experience
  - Industry/Global politics benchmarking
  - Auditing background
- Workshop in January 2001 to obtain BU input
CPDEP Phase 2-4:

- BU visits
  - Nigeria
  - Richmond
  - Houston
  - Kazakhstan
- Telephone Interviews: Other key/major Business Units

- ‘Preferred Alternative’ = concepts, boundaries
  Mgmt. APPROVAL: June 2001
Scope

• Based on ChevronTexaco organization

• Gases Included
  – Carbon Dioxide
  – Methane
  – Nitrous Oxide

• Gases Screened
  – HFCs
  – PFCs
  – SF6
Scope (Continued)

• Emission Sources Included:
  – Onsite fuel consumption
  – Process emissions
  – Flaring
  – Venting
  – Fugitive Emissions
  – Onsite Waste Treatment
Boundaries

• All of owned/operated

• Joint Ventures: Completeness/Credibility/Influence
  – 20% threshold

• Contractors: Completeness/Credibility/Influence
  – Major ‘captive’ contractors
Ownership/Responsibilities: Data Input

**Reporting Unit Responsibilities**

- Monthly Inputs
- Quarterly Upload to corp database
  - Upload parameters specified by Corp
  - Upload process straightforward and user-friendly
Ownership/Responsibilities: Coordination and Certification

- Manager of Operations for Reporting Unit certifies data
- Reporting unit mgmt designates GHG coordinator
  - Analogous to energy coordinator
  - Responsible for completing inventory
  - Coordinate with Operational Excellence efforts and metrics
CPDEP Phase 5:
Operate and Evaluate

• System Rollout: July 10-11, 2001
• Data Input: July-October
• First Report Due: October 17, 2001
  – January-September, 2001 data
  – Monthly Data Input October-December
• Year-end 2001 Report Due: January 16, 2002
• January 2002+: Monthly data input, quarterly reporting for Energy and GHG
ChevronTexaco Energy and Greenhouse Gas System (CEGIS)

- Enables data collection, computation, compilation and reporting
- Excel-based, GIL (Global Information Link) compatible
- Single system and methodology for all opcos
  - User customizes for location
- User can choose input and output units (metric, English, mass, volume)
- Flexible level of detail/aggregation
  - Total refinery fuel gas use OR by source
- Includes API 2001 methodologies
### Energy Research and Technology Company

**Last Report Created: 26-Jun-01**

#### Location

<table>
<thead>
<tr>
<th>Location</th>
<th>CO₂</th>
<th>CH₄</th>
<th>N₂O</th>
<th>CH₄ (CO₂ equivalent)</th>
<th>N₂O (CO₂ equivalent)</th>
<th>Total CO₂ equivalent</th>
<th>Energy (10^6 Btu (LHV))</th>
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#### Module

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<th>CH₄ (CO₂ equivalent)</th>
<th>N₂O (CO₂ equivalent)</th>
<th>CO₂ (CO₂ equivalent)</th>
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#### CO₂ (by Location & Module)

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<tr>
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<th>Acid Gas Removing</th>
<th>Coke Combustion</th>
<th>Cold Vent</th>
<th>Combustion</th>
<th>Flare</th>
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<th>Total (tonne)</th>
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#### CH₄ (by Location & Module)

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<td>6</td>
<td>6</td>
<td>2,621</td>
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</table>
Primary Emission Index

Emission Index (ton (short) / Barrel)

Plot Area

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Total Products
CEGIS Software Control System

• Checks, reviews, documentation of results
• Backup electronic copies of data
• Consistent definition of data
• Restricted access for editing, report design
Data Management

• Corporate
  – Oracle Database developed in tandem with CEGIS
  – Compatible with CEGIS
  – Designed to accommodate future organizational changes

• Opcos
  – System-generated Excel files or site-specific systems for Opcos
  – Details and specifics to be determined as a next step
    • Coordinate with Operational Excellence
What’s Next?

• Add Criteria Pollutants (NOx, SOx, VOCs, CO, PM)
• Customization for opco-specific reports
• Use CEGIS as a tool to help forecast emissions
• Use CEGIS to estimate GHG emissions from new capital projects
Summary

• Systematic, 1+-year effort to develop inventory
  – Project Manager
  – Stakeholder Group
  – 70+ Users
  – Ongoing Help Desk and Upgrades

• Off-the-shelf technology not available

• ChevronTexaco system unique
  – Enterprise-wide deployment
  – Verifiable system
  – Based on API methodology