GOADS Emissions Inventories

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BOEMRE Introduction

- Background
  - BOEMRE AQ Laws and Regulations
  - What is GOADS?
  - Purpose of GOADS
- GOADS-2011
  - Required Structures
  - Schedule
  - BOEMRE Website
  - FAQs

BOEMRE Intro (continued)

- GOADS-2011 Software
  - Data Organization
  - Screenshots of GOADS software
  - Other Features of GOADS software
  - Venting/Flaring
- GOADS-2008 Results
- Querying GOADS-2008 ACCESS Database

BOEMRE AQ Laws and Regulations

- OCS Lands Act (43 U.S.C. 1334 (a)(8))
  - BOEMRE has the authority and responsibility to comply with onshore National Ambient Air Quality Standards (NAAQS), as established in the Clean Air Act
- Federal Clean Air Act Amendments of 1990
  - Establishes NAAQS
  - Requires BOEMRE-EPA coordination
  - Designated OCS area of responsibility

What is GOADS?

- Gulfwide Offshore Activities Data System (GOADS)
- CY emissions data for NAAQS criteria pollutants (CO, SO_2, NO_x, PM_{10}, $PM_{2.5}$, VOC) and greenhouse gases (CO_2, CH_4, N_2O, CO_2e)
- Platform and non-platform emissions on the OCS in the Gulf of Mexico (Central & Western)
- Past efforts- CY 2000, 2005, and 2008

Purpose of GOADS

- The collection and compilation of an air emissions inventory is one of the tasks BOEMRE conducts to assure coordination of air pollution control regulations between OCS offshore sources and State's sources onshore (as per Sec 328(b) of the 1990 CAAA).
- BOEMRE's ongoing assessment of the potential impacts of emissions from oil and gas exploration, development, and production from the Gulf of Mexico OCS to onshore areas.
- Inventory will be used to augment the BOEMRE NEPA process to compute emission trends and to perform necessary air quality impacts assessments.

Required Structures

- All structures in the Western Gulf of Mexico (OCS west of 87° 30’ West longitude)
- Flag minor sources exempt from reporting:
  - Living quarters
  - Caissons
  - Wellhead protectors
  - Other (describe)

GOADS-2011 Schedule

- Operators collect activity data for input into GOADS-2011 from January 1, 2011, to December 31, 2011
- All activity data must be submitted to BOEMRE by April 18, 2012

BOEMRE GOADS Website

- http://www.gomr.boemre.gov/homepg/regulate/environ/airquality/goads.html
- 2000 & 2005 Final Reports and Databases
- 2008 Report and Databases Status
- Included on the “2011 Effort” website:
  - NTL No. 2010-G06
  - GOADS-2011 Software and User’s Guide
  - How to Submit Emissions Reports (E-reporting)
  - Technical Support/Updates- FAQS and Master List for Importing

Updates for GOADS-2011

- Only the company can request static data and submit activity data to BOEMRE (no contractors).
- E-reporting- please check our website for updates
- Volumes vented and flared will be compared and reconciled to OGOR reports. Before submitting data to BOEMRE, please make sure your volumes match between these reports.
- EPA Greenhouse Gas Reporting Rule
  - Subpart C (Combustion) finalized
  - Subpart W (Venting, flaring, fugitives) not finalized, but draft suggests using latest GOADS to report to EPA

GOADS Equipment Types

- Amine Units
- Boilers/Heaters/Burners
- Diesel/Gas Engines
- Drilling Equipment
- Combustion Flares
- Fugitives
- Glycol Dehydrators
- Losses from Flashing
- Mud Degassing
- Natural Gas Engines
- Natural Gas Turbines
- Pneumatic Pumps
- Pressure Controllers
- Storage Tanks
- Cold Vents
- Minor Sources

Data Organization for GOADS-2011

- User/operator information: static
- Platform description data: static
- Equipment description data: static
- Monthly platform and equipment activity data: dynamic

Examples of Static Platform Descriptive Data

- User ID
- Address
- Complex ID
- Structure ID
- Area
- Block
- Latitude/longitude
- Lease number
- Sales gas composition

Examples of Static Equipment Descriptive Data

- Equipment ID
- Stack parameters
- Fugitive component count
- Boilers: heat input, fuel usage rate; fuel heating value
- Diesel engines: horsepower, fuel usage rate, fuel heating value
- Mud degassing: mud type

Examples of Static Equipment Descriptive Data (continued)

- Natural gas turbines and engines: horsepower, fuel usage rate, fuel heating value, make and model
- Pneumatic pumps: make and model
- Pressure level controllers: make and model
- Storage tanks: dimensions

Examples of Dynamic Equipment Data (monthly)

- Operating hours
- Total fuel used
- Processed throughput
- Volume flared
- Volume vented

Other Features of GOADS-2011

- Access file import and export features
- Excel export feature
- Flag inactive platforms or equipment as “No Emissions to Report”
- Flag minor sources exempt from reporting:
  - Living quarters
  - Caissons
  - Wellhead protectors
  - Other (describe)

Interaction with GOADS-2008

- Import feature for GOADS-2008 static description platform and equipment data
- Request GOADS-2008 files from BOEMRE for import into GOADS-2011
- January 2011 descriptive fields populated
- Review data closely and edit as needed
- Create records for new structures and equipment that were not in place in 2008
- Create records for minor sources flagged in GOADS-2008

New User

Please enter your User Information

Only the owner/lessees can be listed as the Registered User

BOEM Company No*: (5 characters or less)

Contact Name*:

Phone*: ( ) - ext

Fax: ( ) -

Email*:

Company Name*:

Address 1*:

Address 2:

City*:

State*:

Zip Code*:

Inventory Year*:

* = Required Information

OK Cancel

BOEM Gulfwide Offshore Activity Data System (GOADS-2011) - Description Edit Mode

File Edit Help

Operator: ERG

Operator

General Information

GOADS-2011 Registered User

Only the owner/lessees can be listed as the Registered User

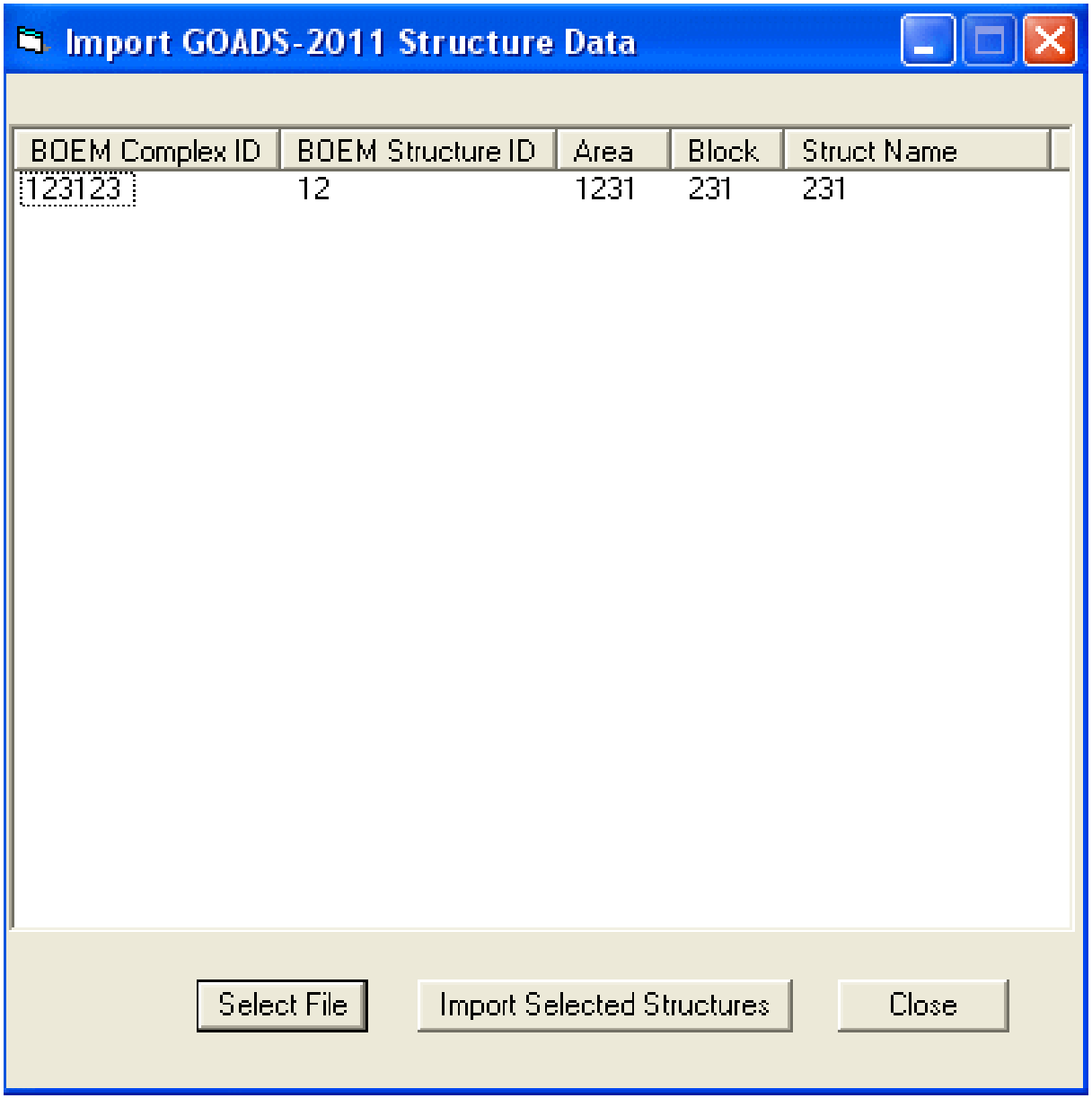
New Structure

Contact Name:	Darcy Wilson
Phone:	(919) 468 - 7860 ext
Fax:	( ) -
Email:	darcy.wilson@erg.com

Company Name:	Eastern Research Group, Inc.
Address 1:	1600 Perimeter Park Drive Suite 200
Address 2:	
City:	Morrisville
State:	NC
Zip Code:	27560

Edit Activity Data | Print Screen | Edit Data

Operator: ERG


Import GOADS-2011 Structure Data
BOEM Complex ID
BOEM Structure ID
Area
Block
Struct Name
123123
12
1231
231
231
Select File
Import Selected Structures
Close

BOEM Gulfwide Offshore Activity Data System (GOADS-2011) - Description Edit Mode

File Edit Help

Operator: ERG

Operator

General Information

GOADS-2011 Registered User

Only the owner/lessees can be listed as the Registered User

New Structure

New Structure

BOEM Company No: ERG

Area:

BOEM Complex ID (7 chars):

Block:

BOEM Structure ID (2 chars):

Name:

OK

Cancel

Edit Activity Data

Print Screen

Edit Data

Operator: ERG

BOEM Gulfwide Offshore Activity Data System (GOADS-2011) - Description Edit Mode

File Edit Help

Operator: ERG
23, 123, 23

Structure - EDIT DATA

General Information | Sales Gas | QC Results

BOEM Struct. ID: 12
BOEM Cmplx. ID: 123
Area: 23
Block: 123
Structure Name: 23

Lease Number:
Longitude (dec. degrees):
Latitude (dec. degrees):
Distance To Shore (mi):

Add New Equipment

Minor Source Exempt from Reporting: Yes

Caisson
Living Quarters
Wellhead Protector
Other (describe in coments)

Edit Activity Data | Print Screen | Run QC | Save | Cancel | End Edit & Save

Operator: ERG\23, 123, 23

BOEM Gulfwide Offshore Activity Data System (GOADS-2011) - Activity Edit Mode

File Edit Help

- Operator: ERG
  - Monthly Survey 2011/01
    - 23, 123, 23
      - Amine Unit: 12321
      - NG Turbine: 1231

Natural Gas, Diesel, or Dual-Fuel Turbine - EDIT DATA

General Information | QC Results

Manufacturer:

Model No.:

Engine Purpose of Use:

Natural Gas Usage

Operating Horsepower (hp):

Average Fuel Usage: (Btu/hp-hr)

Fuel H2S Content (ppmv):

Fuel Heating Value (Btu/scf):

Max Rated Horsepower (hp):

Max Rated Fuel Usage: (Btu/hp-hr)

Hours Operated (hrs):

Total Fuel Used (Mscf):

Diesel Usage

Operating Horsepower (hp):

Average Fuel Usage: (Btu/hp-hr)

Fuel Sulfur Content (% by mass):

Fuel Heating Value (Btu/lb):

Max Rated Horsepower (hp):

Max Rated Fuel Usage: (Btu/hp-hr)

Hours Operated (hrs):

Total Fuel Used (gal):

Comments:

No Emissions to Report

Edit Description Data | Print Screen | Run QC | Save | Cancel | End Edit & Save

Operator: ERG\Monthly Survey 2011/01\23, 123, 23\NG Turbine: 1231

QA Summary Form

- Export PDF and submit with GOADS-2011 file
- Does not supersede QC results
- Identifies key data that are needed to calculate emission estimates
- Data fields listed in Appendix B of User's Guide

Exporting Files

- Export entire inventory at one time for submittal to BOEMRE (preferred)
- Can export select monthly surveys
- Can export only descriptive data

BOEM Gulfwide Offshore Activity Data System (GOADS-2011) - Activity Edit Mode

File Edit Help

Operator: ERG
Monthly Survey 2011/01
23, 123, 23
Amine Unit: 12321
Cold Vent: 12313
NG Turbine: 1231

Vent - EDIT DATA

General Information | QC Results

Vent Type:

Hours Operated (hrs), including upsets:
Volume Vented (Mscf), including upsets:
Vent Gas H2S Concentration (ppmv):
Vent Gas VOC Concentration (ppmv):
Avg Molecular Weight of VOCs (lb/lb-mol):

Stack Outlet Elevation (ft msl):
Stack Inner Diameter (in):
Avg. Exit Velocity (ft/s), excl. upsets:
Avg. Exit Temperature (°F):
Stack Orientation (degrees):
Installed Control Equipment:
Condenser Temperature (°F):
Condenser Pressure (psia):

Comments:

No Emissions to Report

Edit Description Data | Print Screen | Run QC | Save | Cancel | End Edit & Save

Operator: ERG\Monthly Survey 2011/01\23, 123, 23\Cold Vent: 12313

BOEM Gulfwide Offshore Activity Data System (GOADS-2011) - Activity Edit Mode

File Edit Help

- Operator: ERG
  - Monthly Survey 2011/01
    - 23, 123, 23
      - Amine Unit: 12321
      - Cold Vent: 12313
      - Combustion Flare: 1
      - NG Turbine: 1231

Flare - EDIT DATA

General Information | QC Results

Flare Gas H2S Concentration (ppmv):

Is there a continuous pilot? No

Pilot Fuel Feed Rate (Mscf/day):

Flare Combustion Efficiency (%):

Smoking Condition:

Hours Operated (hrs), including upsets:

Volume Flared (Mscf), including upsets:

Stack Outlet Elevation (ft msl):

Stack Inner Diameter (in):

Avg. Exit Velocity (ft/s), excl. upsets:

Avg. Combustion Temp. (°F):

Stack Orientation (degrees):

Comments;

No Emissions to Report

Edit Description Data | Print Screen | Run QC | Save | Cancel | End Edit & Save

Operator: ERG\Monthly Survey 2011/01\23, 123, 23\Combustion Flare: 12312

GOADS-2008 Results

- Gulfwide Platform and Non-Platform emissions were calculated
- 103 companies submitted for 3,153 active platforms
- 1,534 were flagged minor sources
- Draft Report and Databases on our GOADS website under 2008

Emission Estimation Procedures—Platform Sources

- Estimation methods listed in report online
- Monthly activity data QA'd; surrogates used as needed
- Emission factors from EPA's AP-42, *Compilation of Air Pollutant Emission Factors*
- Emission estimation methods from the Emission Inventory Improvement Program (EIIP)
- AMINECalc software and GLYCalc regressions
- CO2e
  - CO2:1
  - CH4: 21
  - N20: 310

2008 Results- Platform Criteria

Equipment	CO Emissions (tpy)	NO_x Emissions (tpy)	PM_{10} Emissions (tpy)	SO_2 Emissions (tpy)	VOC Emissions (tpy)
Amine Units	0	0	0	3	1
Boilers/heaters/ Burners	716	1,482	26	9	46
Diesel Engines	1,816	7,463	308	715	353
Drilling Equipment	549	2,072	37	262	52
Combustion Flares	1,315	257	2	2	22
Fugitives	0	0	0	0	25,844
Glycol Dehydrators	0	0	0	0	2,573
Losses From Flashing	0	0	0	0	949
Minor Sources	0	0	0	0	186
Mud Degassing	0	0	0	0	26
Natural Gas Engines	75,408	52,736	250	15	1,312
Natural Gas Turbines	2,847	11,107	66	21	73
Pneumatic Pumps	0	0	0	0	1,962
Pressure/level Controllers	0	0	0	0	4,102
Storage Tanks	0	0	0	0	909
Cold Vents	0	0	0	0	27,013
Total Emissions (tpy)[a]	82,651	75,117	689	1,028	65,423

[a] Totals may not sum due to rounding

2008 Results- Platform GHG

Equipment Types	CO_2 Emissions (tpy)	CH_4 Emissions (tpy)	N_2O Emissions (tpy)	CO_2e Emissions (tpy)
Amine Units	0	8	0	171
Boilers/heaters/burners	1,099,342	19	18	1,105,436
Diesel Engines	336,836	10	N/A	337,053
Drilling Equipment	106,873	N/A	N/A	106,873
Combustion Flares	422,696	446	7	434,352
Fugitive Sources	0	106,418	0	2,234,786
Glycol Dehydrators	N/A	19,505	N/A	409,615
Losses From Flashing	475	20,890	0	439,169
Minor Sources	0	565	0	11,871
Mud Degassing	1	200	0	4,193
Natural Gas Engines	2,896,173	12,264	N/A	3,153,715
Natural Gas Turbines	3,818,697	299	104	3,857,248
Pneumatic Pumps	451	21,515	0	452,275
Pressure/level Controllers	589	32,256	0	677,967
Storage Tanks	0	901	0	18,919
Cold Vents	3,260	224,620	0	4,720,290
Total Emissions (tpy)	8,685,393	439,917	130	17,963,933

[a] Totals may not sum due to rounding

Non-platform Sources

- Oil/Gas Production Sources
  - Drilling Rigs
  - Pipelaying Operations
  - Support Helicopters
  - Support Vessels
  - Survey Vessels
- Non-Oil/Gas Production Sources
  - Biogenic and Geogenic Sources
  - Commercial Fishing Vessels
  - Commercial Marine Vessels
  - LOOP
  - Military Vessels
  - Vessel Lightering

Data Collection & Estimation—Non-platform Sources

- Oil/gas production source activity data obtained from BOEMRE, vessel operators, the Offshore Marine Service Association, and the FAA
- Non-oil/gas production source activity data obtained from NOAA, the Maritime Administration, the LOOP, and the U.S. Coast Guard
- Estimations based on Swedish EPA EF (Marine Vessels) and EPA EF, plus EIIP methods

2008 Results— Non-platform Criteria

Source Category	CO Emissions (tpy)	NO_x Emissions (tpy)	PM_{10} Emissions (tpy)	SO_2 Emissions (tpy)	VOC Emissions (tpy)
Drilling Rigs	5,343	58,288	971	7,772	971
Pipelaying Vessels	2,186	10,535	398	1,789	398
Support Helicopters	13,636	1,114	217	275	2,693
Support Vessels	12,880	135,222	2,342	18,221	2,342
Survey Vessels	141	1,690	26	204	26
Total OCS Oil/Gas Production Sources (tpy)	34,186	206,849	3,954	28,261	6,430
Biogenic/Geogenic Sources	0	0	0	0	14,358
Commercial Fishing Vessels	681	8,120	124	988	124
Commercial Marine Vessels	6,593	79,329	6,603	49,009	2,794
LOOP	136	1,832	33	219	613
Military Vessels	702	8,539	158	1,409	130
Vessel Lightering	320	3,060	86	397	4,423
Total Non-OCS Oil/Gas Production Sources (tpy)	8,432	100,880	7,004	52,022	22,442
Total Non-Platform Emissions (tpy)[a]	42,618	307,729	10,958	80,283	28,872

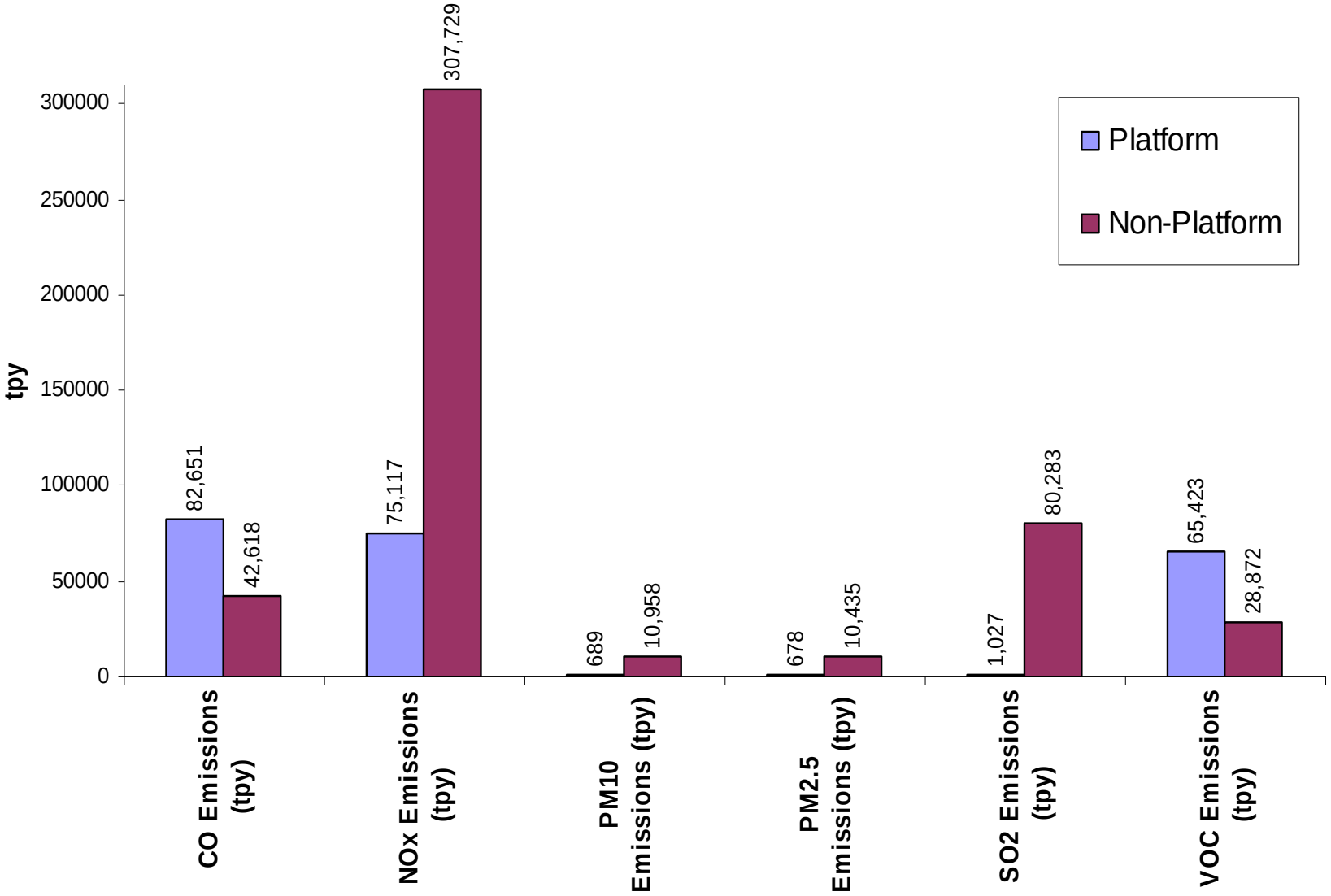
[a] Totals may not sum due to rounding

2008 Results- Non-platform GHG

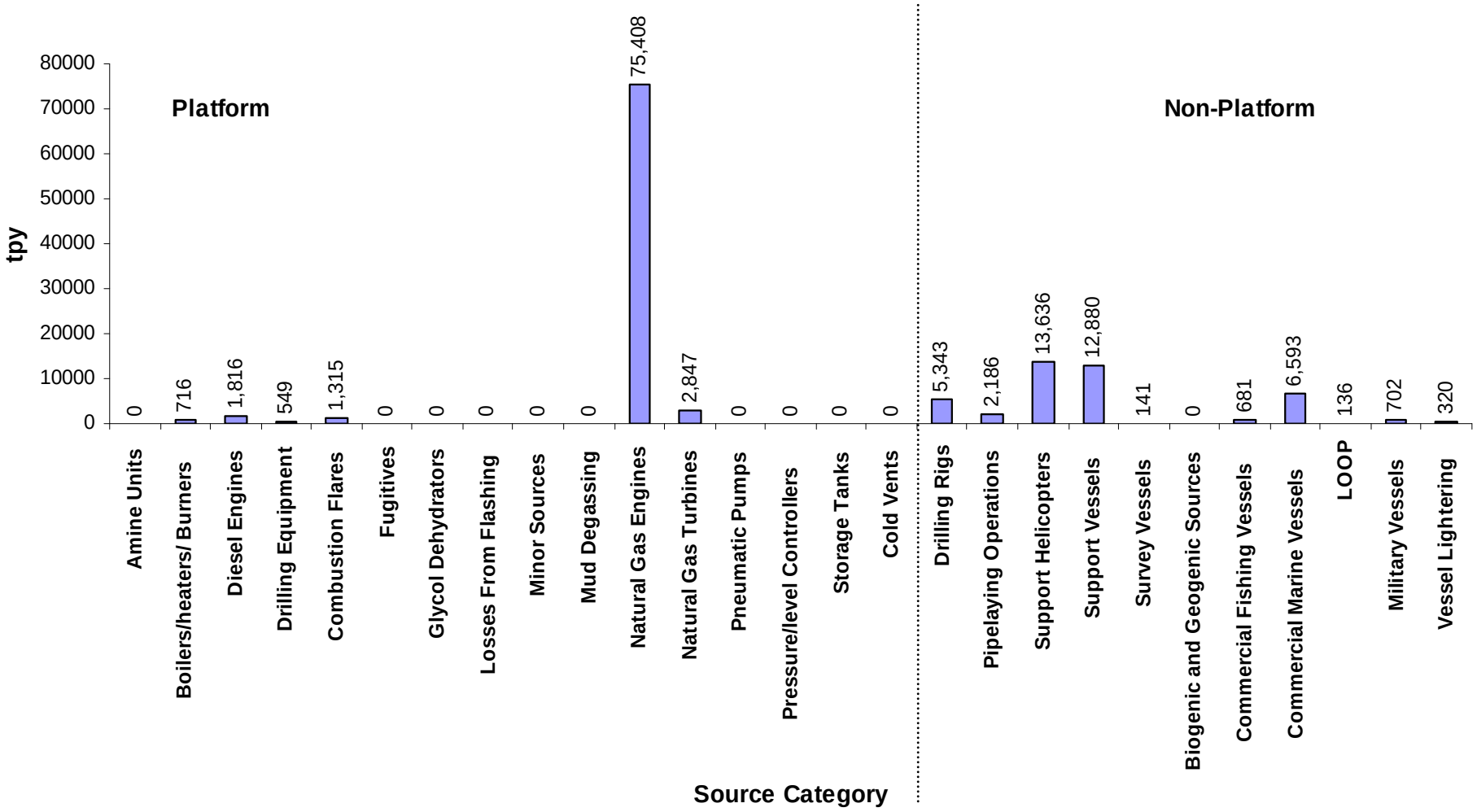
Source Category	CO_2 Emissions (tpy)	CH_4 Emissions (tpy)	N_2O Emissions (tpy)	CO_2e Emissions (tpy)
Biogenic and Geogenic Sources	2,284	1,874	1,948	645,518
Commercial Fishing	402,437	2	19	408,369
Commercial Marine Vessels	3,013,948	N/A	N/A	3,013,948
Drilling Rigs	3,166,971	19	151	3,214,188
LOOP	88,564	1	4	89,825
Military Vessels	417,677	3	20	423,940
Pipelaying Operations	712,570	8	31	722,348
Support Helicopters	1,373,574	N/A	N/A	1,373,574
Support Vessels	7,418,855	47	352	7,528,962
Survey Vessels	83,500	1	4	84,761
Vessel Lightering	160,038	2	7	162,250
Total Emissions (tpy)	16,840,418	1,957	2,536	17,667,683

[a] Totals may not sum due to rounding

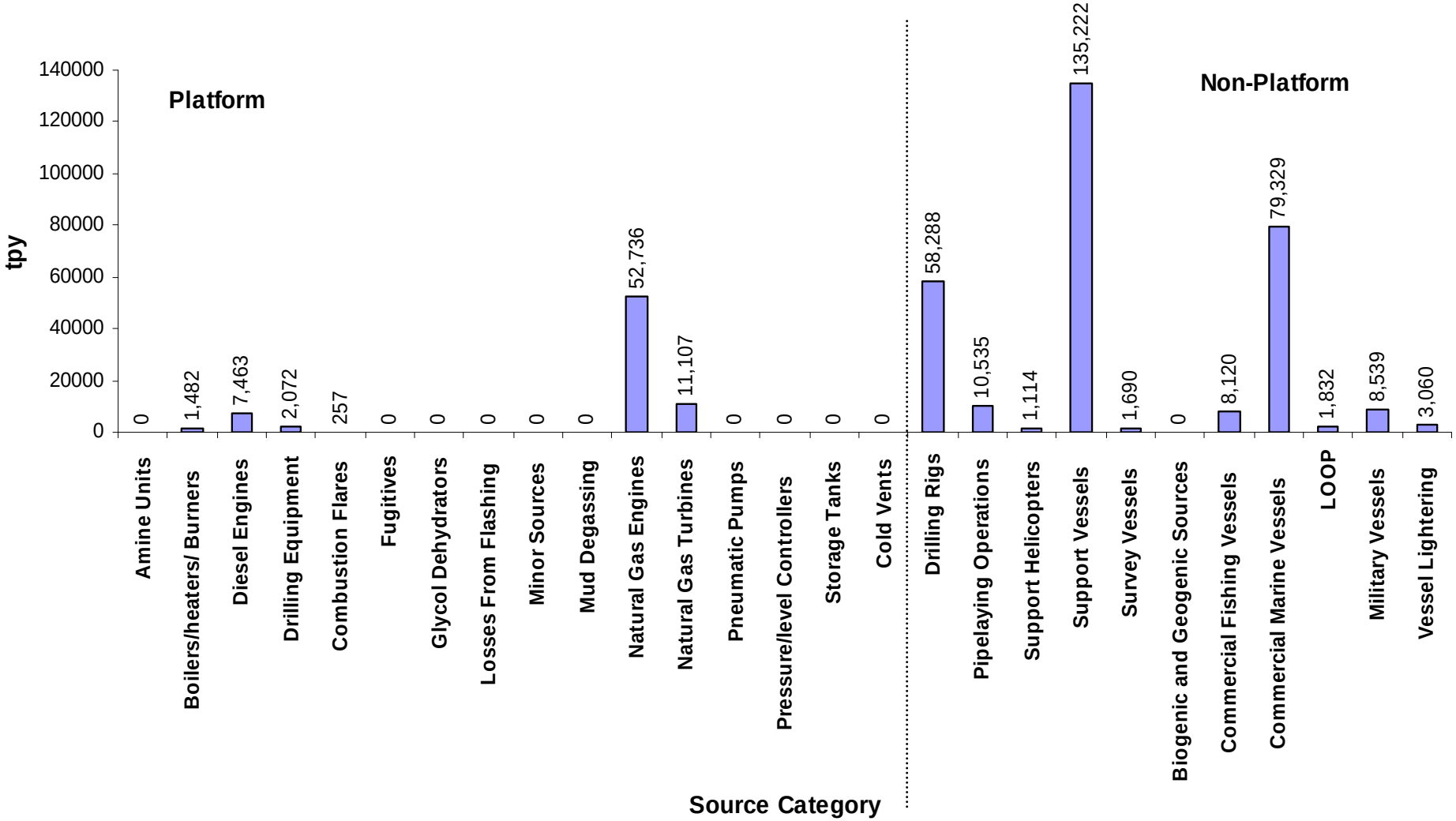
Criteria Emissions 2008



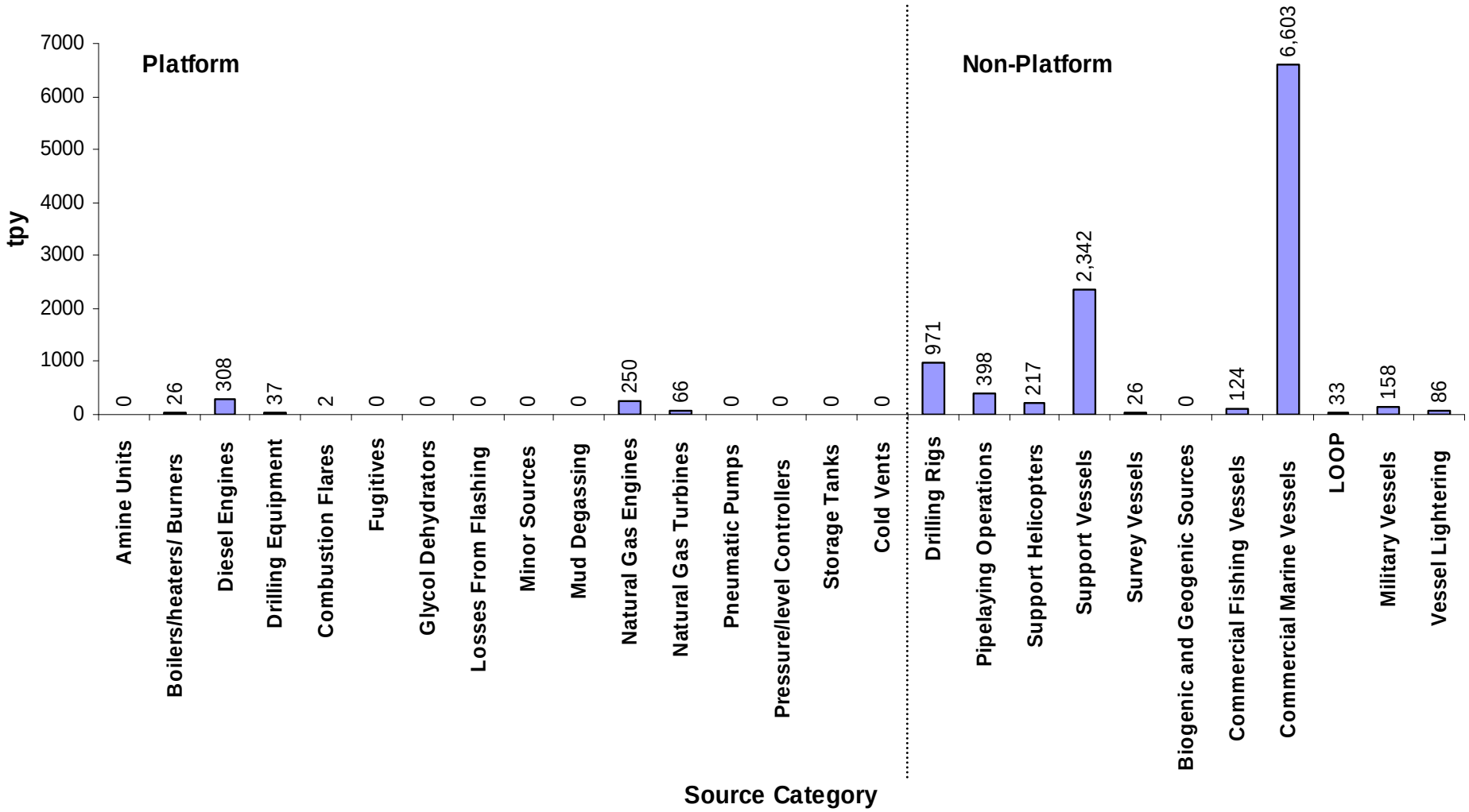
Gulfwide CO Emissions 2008 (tpy)



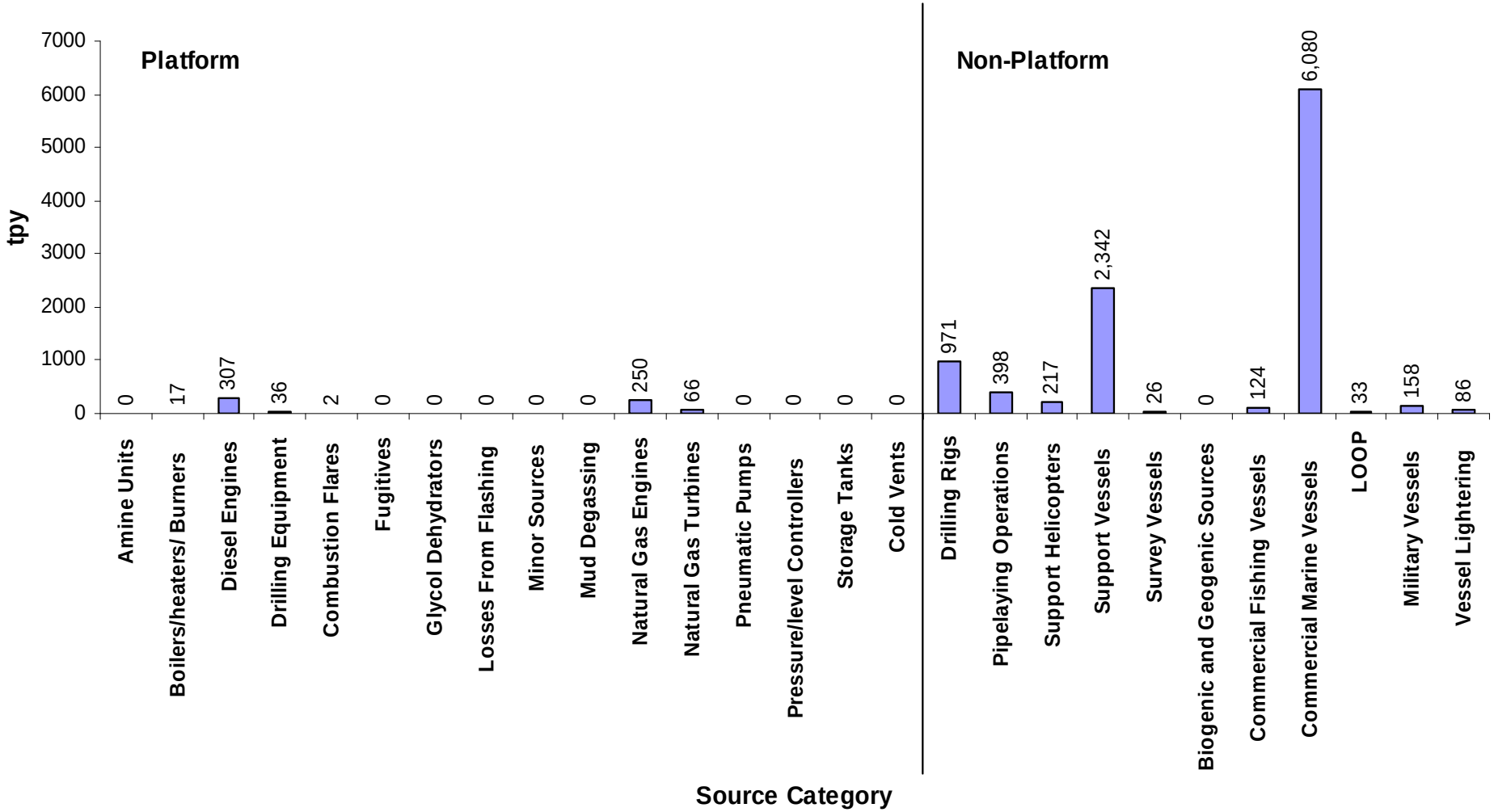
Gulfwide NOx Emissions 2008 (tpy)



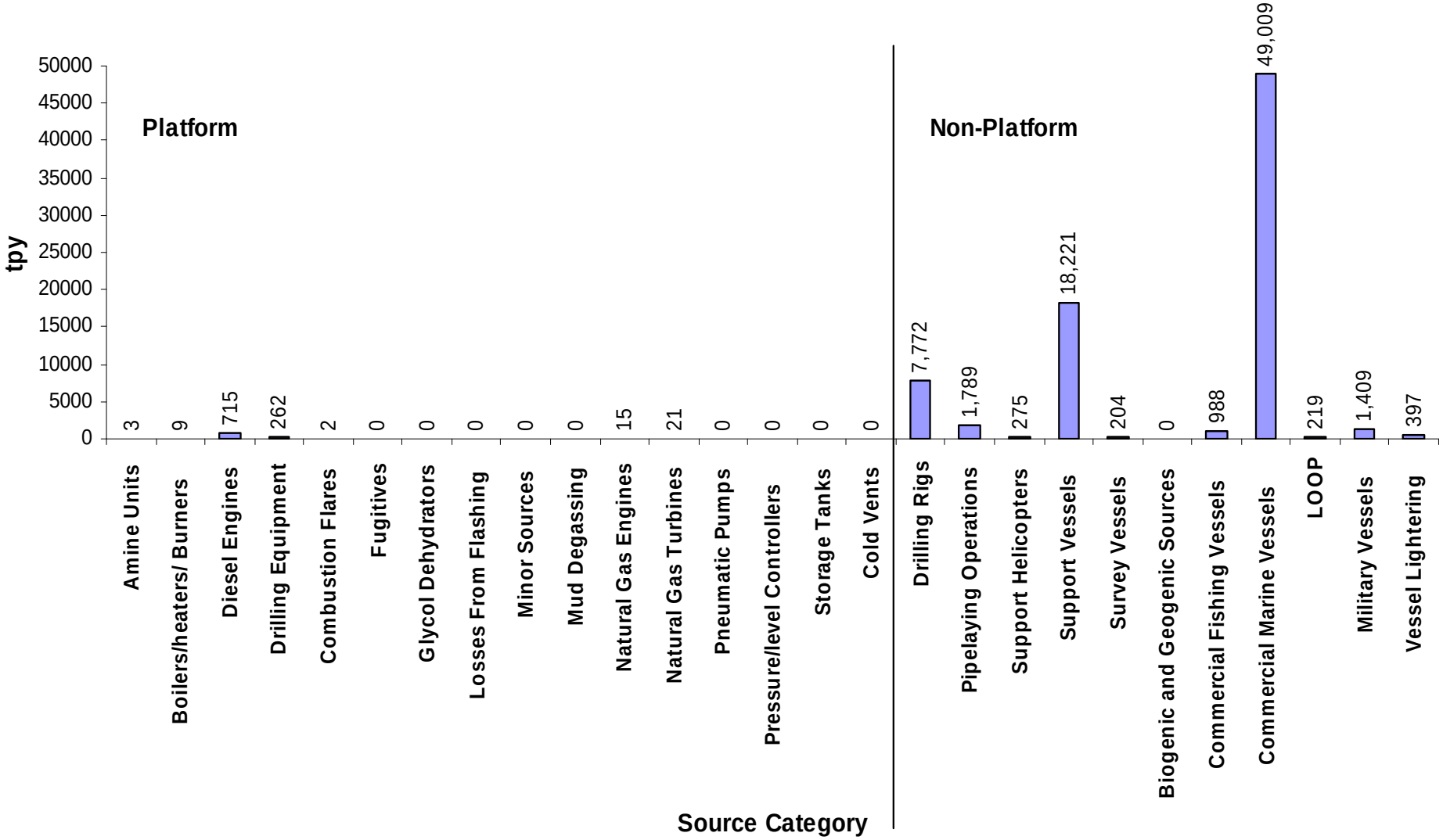
Gulfwide PM10 Emissions 2008 (tpy)



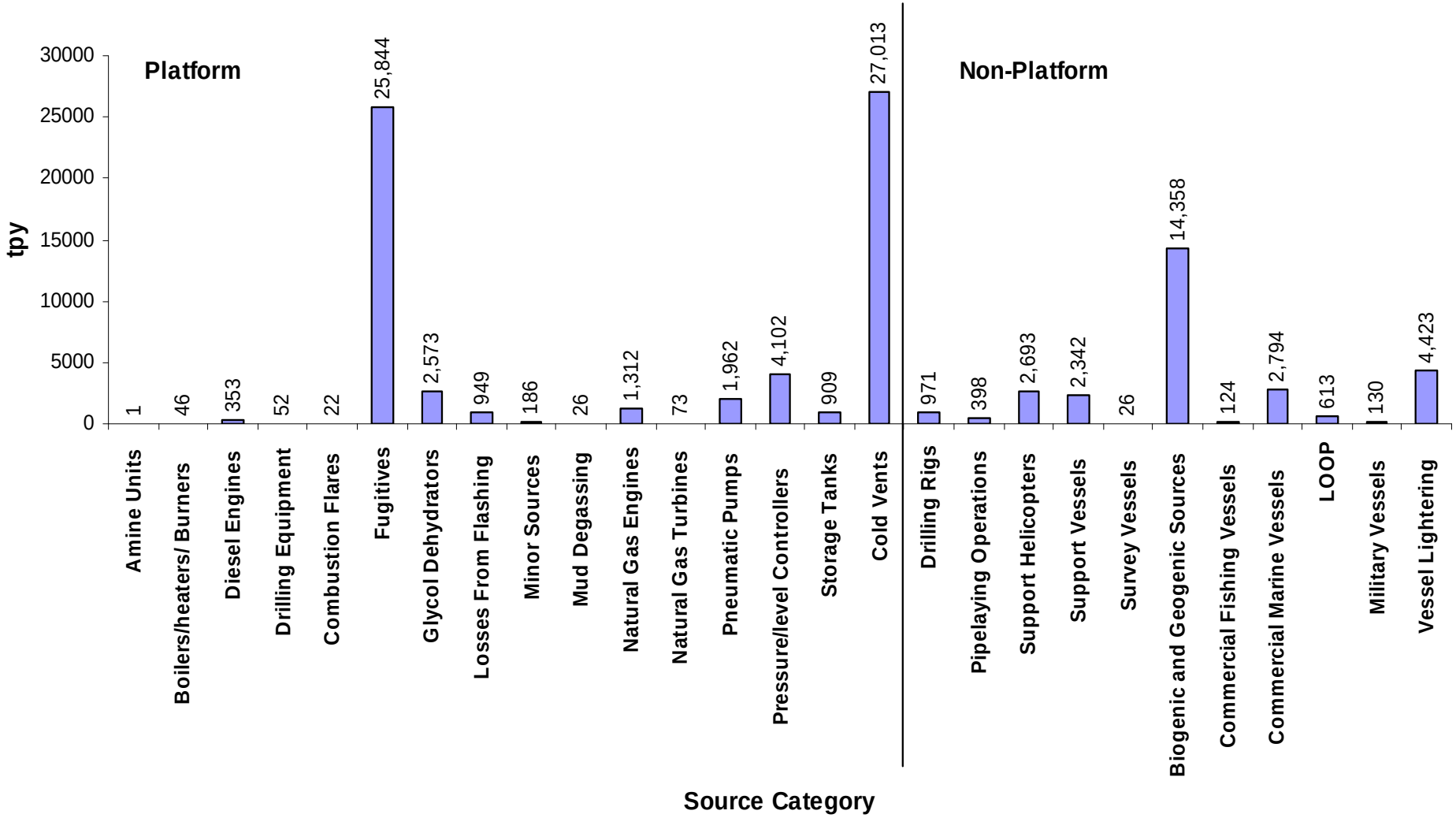
Gulfwide PM2.5 Emissions 2008 (tpy)

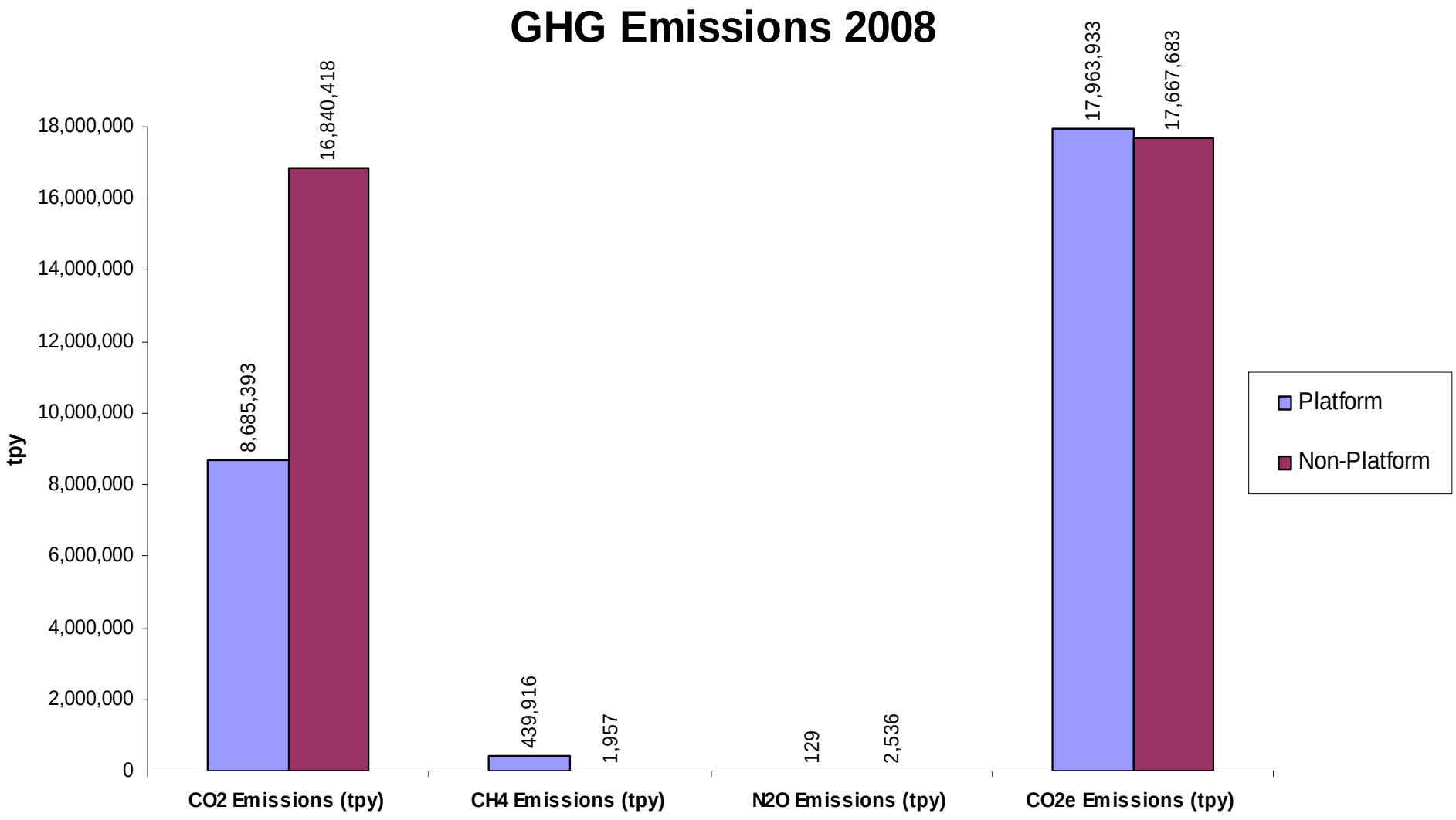


Gulfwide SO2 Emissions 2008 (tpy)

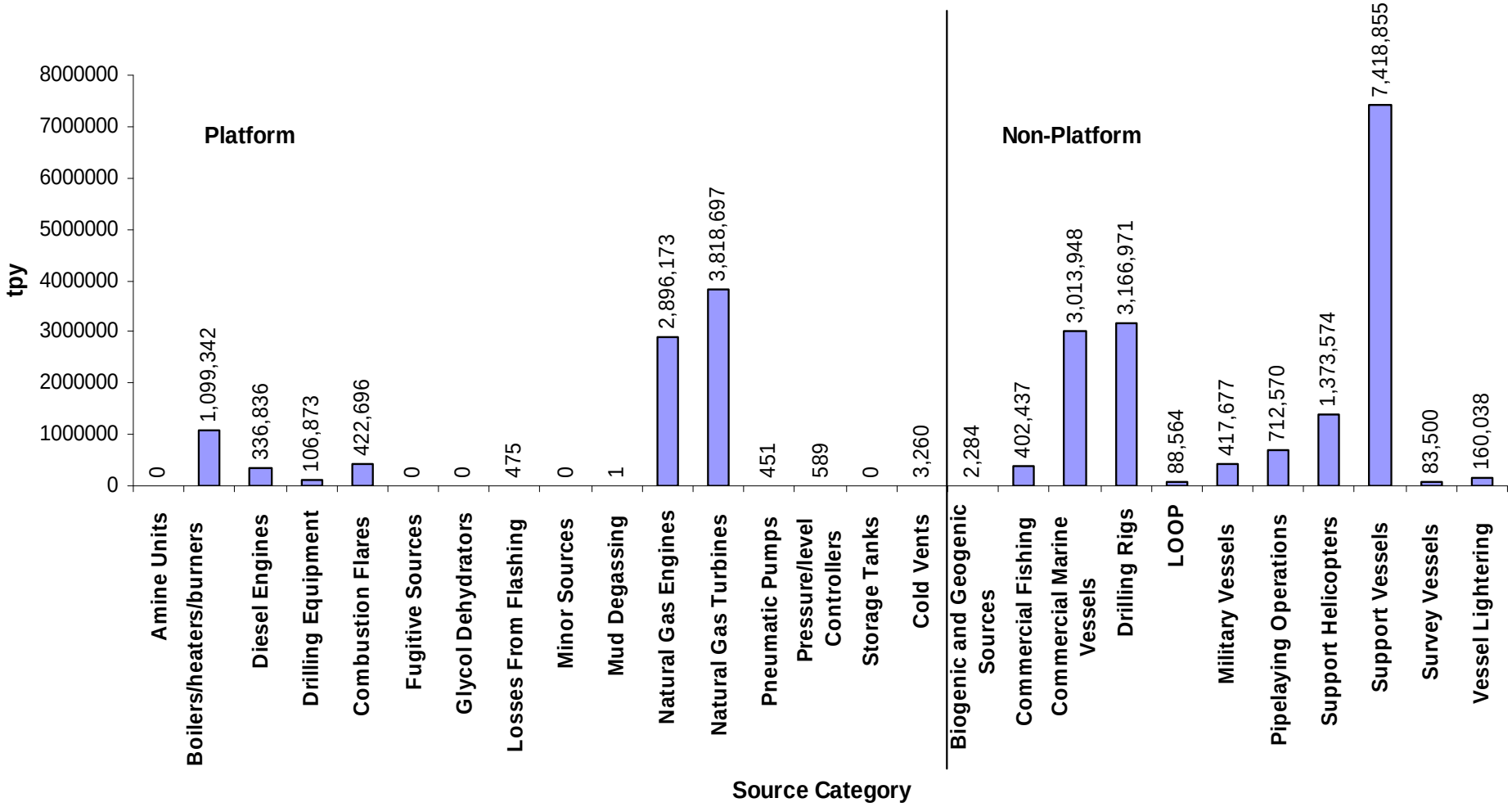


Gulfwide VOC Emissions 2008 (tpy)

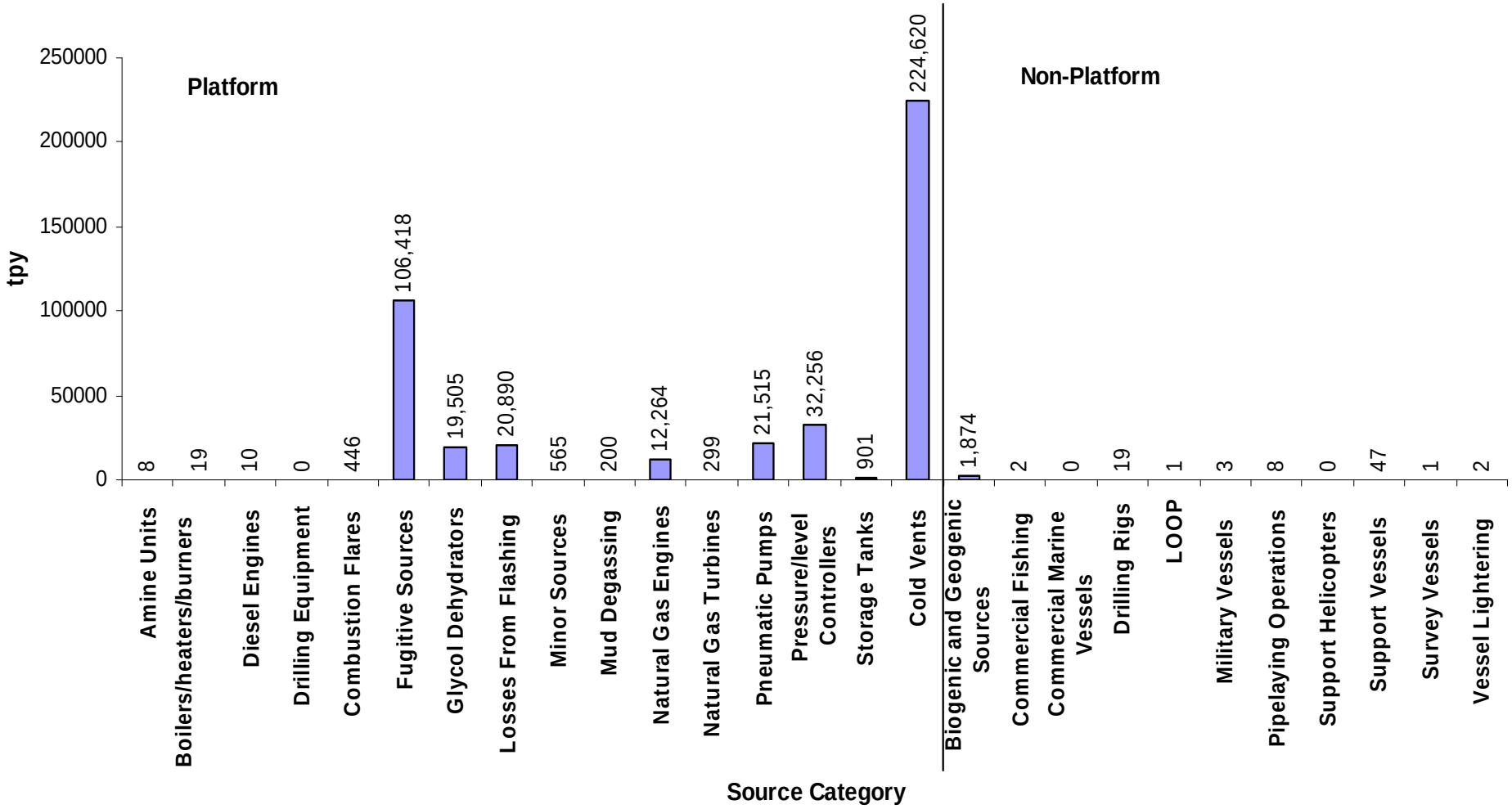



GHG Emissions 2008
tpy
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
8,685,393
16,840,418
439,916
1,957
129
2,536
17,963,933
17,667,683
CO2 Emissions (tpy)
CH4 Emissions (tpy)
N2O Emissions (tpy)
CO2e Emissions (tpy)
Platform
Non-Platform

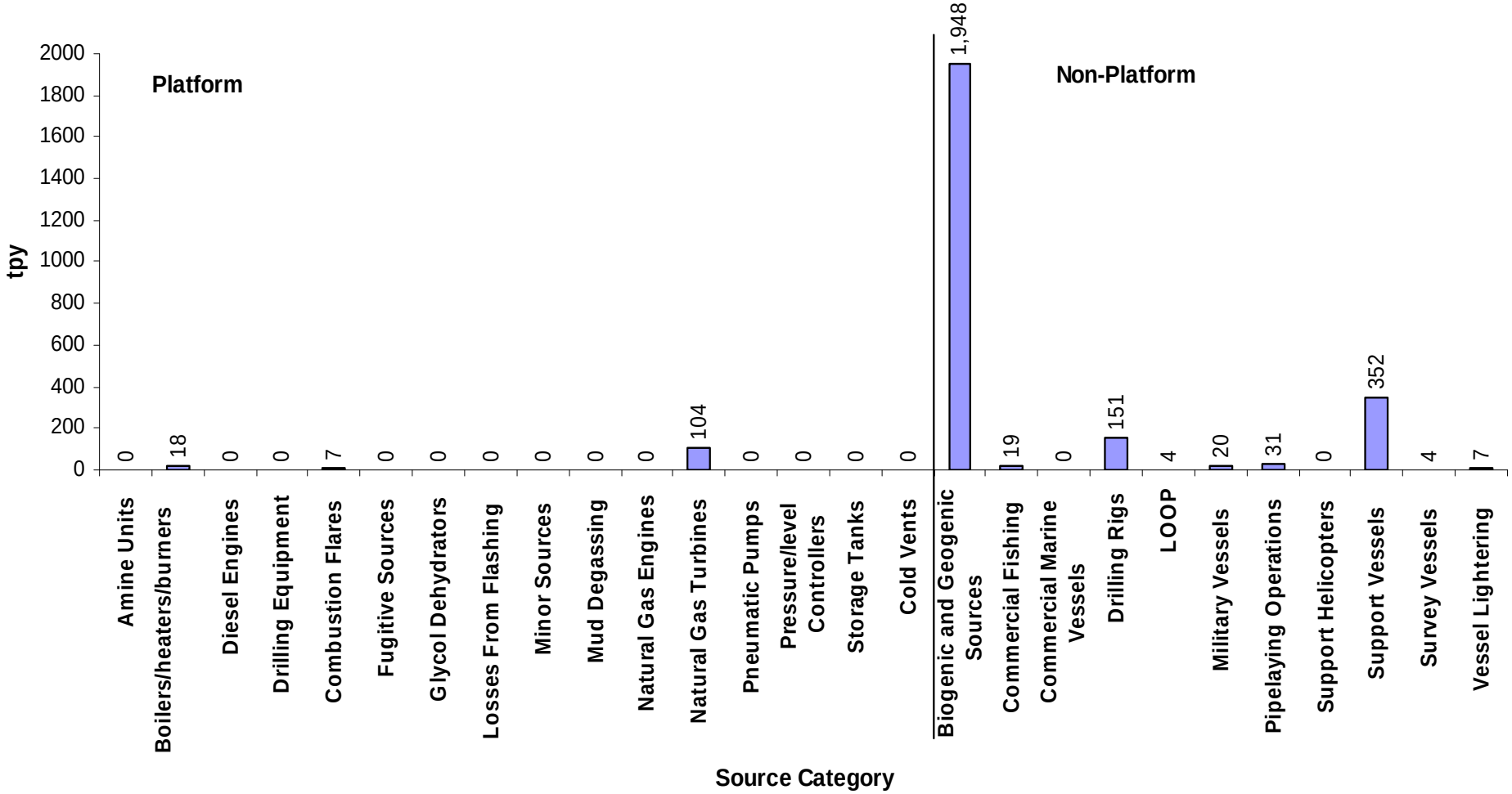
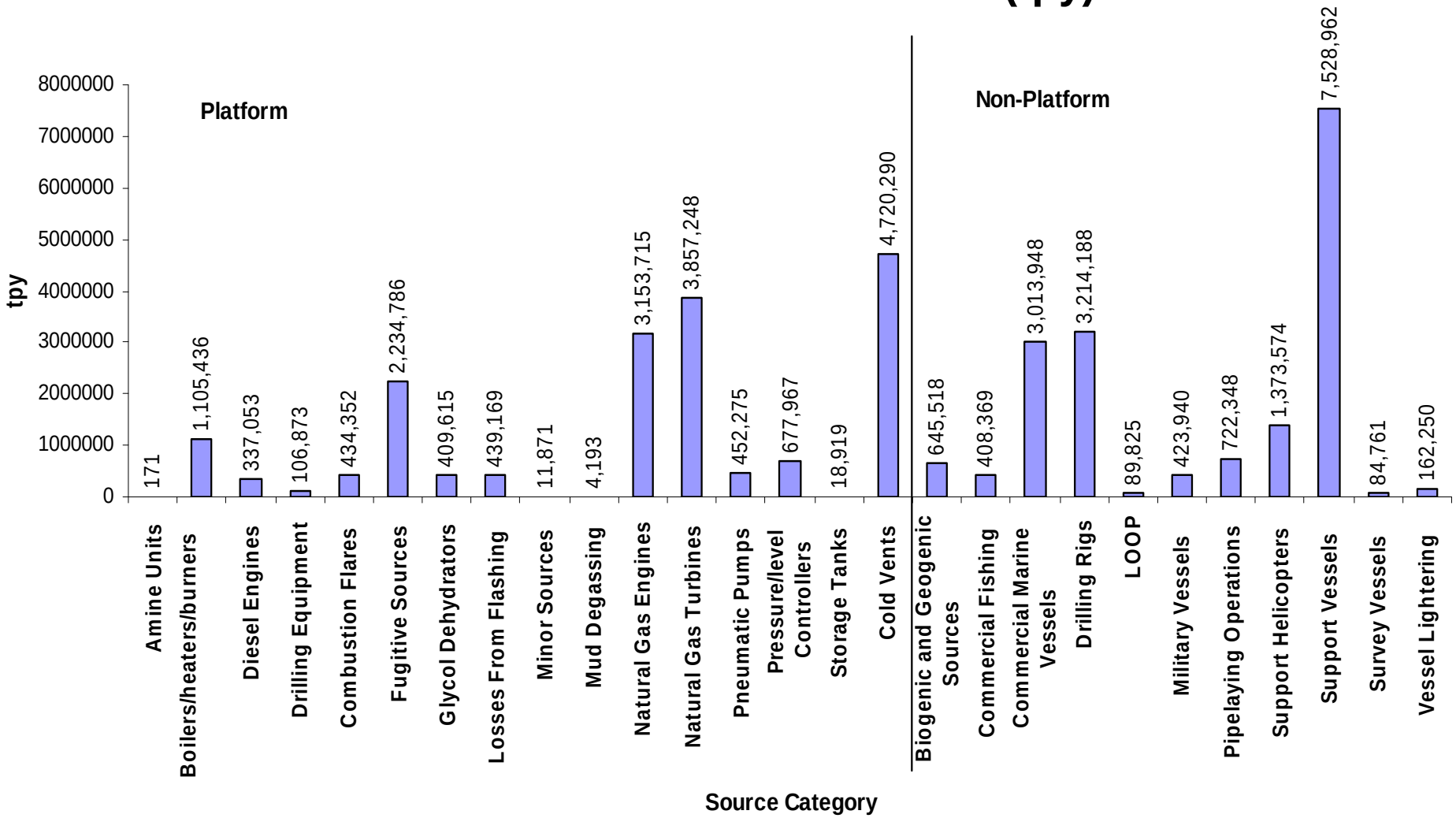
Gulfwide CO2 Emissions 2008 (tpy)



Gulfwide CH4 Emissions 2008 (tpy)



Gulfwide N2O Emissions 2008 (tpy)



Gulfwide CO2e Emissions 2008 (tpy)