



UCD Michael Smurfit
Graduate Business School

Carbon Disclosure Quality: Oil & Gas

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[Views expressed are not necessarily shared by DG FISMA. Authors alphabetically listed.]

Summary

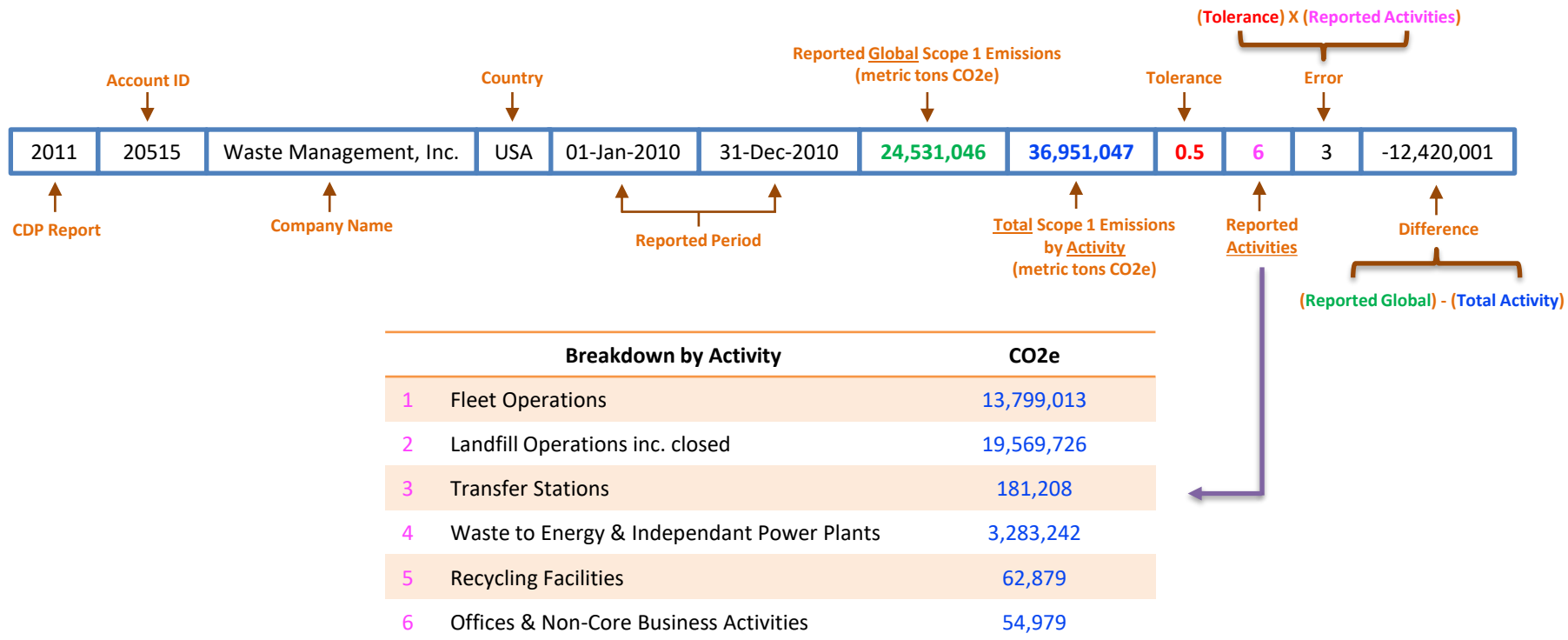
- When reporting their Global Scope 1 and Scope 2 greenhouse gas emissions (GHG) to the Carbon Disclosure Project (CDP), companies are encouraged to also *voluntarily* report their total GHG emissions broken down into (i) Activities, (ii) Business Units, (iii) Facilities, (iv) GHG types and (v) Regions.
- If companies had a suitable software or just an accurate Excel sheet for their voluntary GHG breakdown reporting, the equation 1 should hold:
Reported Global Emissions = Sum of Breakdown [Basic Bookkeeping Test]
- If companies struggled with a suitable software or an accurate Excel sheet but followed the Precautionary Principle (*'If in doubt, err on the side of the planet not on the side of the company'*) as required by the EU's Paris Aligned Benchmarks for their voluntary GHG breakdown reporting, the equation 2 should hold:
Reported Global Emissions \geq Sum of Breakdown [Acting in Good Faith Test]
- We investigate in Tests 1 and Tests 2, if equation 1 and 2, respectively, hold in the entire CDP database between 2010 and 2019 for
 - all 5 breakdowns in Scope 1
 - all 4 available breakdowns on Scope 2
(GHG types not available for Scope 2 in CDP database)



Example of Test 1:

Reported Global Emissions \neq Sum of Breakdown

Emissions by Activity



Rounding “Tolerance”:

Method 1

$$\frac{0.5}{10^x}$$

x : number of decimal places on reported global CO2

Method 2

$$0.5 \times 10^x$$

x : number of zeros in the rounding
(rounding to the **nearest** multiple of 10)



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Test 1

Basic Bookkeeping Test

Test 1: CDP Scope 1 (TPI Oil & Gas)

Reported Global Emissions \neq Sum of Breakdown

		CDP Report										Total	Average
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019		
Activity	Mismatch		1	4	2	3	3	3	1	1	1	19	2.1
	Percentage (preprocessed)		16.7	40.0	20.0	30.0	27.3	30.0	9.1	33.3	33.3		26.6
	Total Reports (preprocessed)		6	10	10	10	11	10	11	3	3		8.2
Business	Mismatch	5	5	2	4	4	6	6	6	2	3	43	4.3
	Percentage (preprocessed)	27.8	25.0	10.5	22.2	18.2	27.3	27.3	28.6	20.0	27.3		23.4
	Total Reports (preprocessed)	18	20	19	18	22	22	22	21	10	11		18.3
Facility	Mismatch	5	2	2	2	2	2	2	1	2	1	21	2.1
	Percentage (preprocessed)	62.5	28.6	50.0	50.0	40.0	40.0	33.3	20.0	33.3	16.7		37.4
	Total Reports (preprocessed)	8	7	4	4	5	5	6	5	6	6		5.6
GHG	Mismatch	7	6	4	6	6	6	7	6	6	6	60	6.0
	Percentage (preprocessed)	31.8	26.1	18.2	28.6	27.3	28.6	33.3	30.0	33.3	33.3		29.1
	Total Reports (preprocessed)	22	23	22	21	22	21	21	20	18	18		20.8
Region	Mismatch	3	2	1	3	3	6	3	4	4	3	32	3.2
	Percentage (preprocessed)	14.3	9.1	4.3	14.3	13.6	27.3	14.3	18.2	22.2	16.7		15.4
	Total Reports (preprocessed)	21	22	23	21	22	22	21	22	18	18		21.0
Total Mismatches		20	16	13	17	18	23	21	18	15	14	175	
Total Organisations (preprocessed)		26	27	27	25	26	27	27	27	18	18	248	24.8
*Number Mismatch Orgs		12	9	7	9	8	14	12	10	8	7	96	9.6
*Percentage Mismatch Orgs (preprocessed)		46.2	33.3	25.9	36.0	30.8	51.9	44.4	37.0	44.4	38.9		38.9
*Number Mismatch Orgs: organisation appears at LEAST one time in the breakdowns													

Preprocessing:

- Reported periods of previous CDP reports were not considered, e.g., the following ranges were considered for 2010, 2011, and 2019:
 - 2010: From 01 January 2009 To 31 December 2010
 - 2011: From 01 January 2010 To 31 December 2011
 - 2019: From 01 January 2018 To 31 December 2019
- Only numeric values were considered, i.e., values like "Null" or "N/A" were not added to the total sum on each breakdown.





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Test 2

Acting in Good Faith Test



Test 2: CDP Scope 1 (TPI Oil & Gas)

Reported Global Emissions < Sum of Breakdown

		CDP Report									Total	Average	
		2010	2011	2012	2013	2014	2015	2016	2017	2018			2019
Activity	Mismatch		0	1	1	1	2	1	0	1	0	7	0.8
	Percentage (preprocessed)		0.0	10.0	10.0	10.0	18.2	10.0	0.0	33.3	0.0		10.2
	Total Reports (preprocessed)		6	10	10	10	11	10	11	3	3		8.2
Business	Mismatch	1	2	0	0	4	4	0	2	0	1	14	1.4
	Percentage (preprocessed)	5.6	10.0	0.0	0.0	18.2	18.2	0.0	9.5	0.0	9.1		7.1
	Total Reports (preprocessed)	18	20	19	18	22	22	22	21	10	11		18.3
Facility	Mismatch	1	1	0	0	0	0	0	0	0	1	3	0.3
	Percentage (preprocessed)	12.5	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7		4.3
	Total Reports (preprocessed)	8	7	4	4	5	5	6	5	6	6		5.6
GHG	Mismatch	2	2	0	0	3	2	3	3	2	1	18	1.8
	Percentage (preprocessed)	9.1	8.7	0.0	0.0	13.6	9.5	14.3	15.0	11.1	5.6		8.7
	Total Reports (preprocessed)	22	23	22	21	22	21	21	20	18	18		20.8
Region	Mismatch	1	1	1	0	3	3	1	2	2	0	14	1.4
	Percentage (preprocessed)	4.8	4.5	4.3	0.0	13.6	13.6	4.8	9.1	11.1	0.0		6.6
	Total Reports (preprocessed)	21	22	23	21	22	22	21	22	18	18		21.0
Total Mismatches		5	6	2	1	11	11	5	7	5	3	56	
Total Organisations (preprocessed)		26	27	27	25	26	27	27	27	18	18	248	24.8
*Number Mismatch Orgs		5	3	2	1	5	7	4	4	4	3	38	3.8
*Percentage Mismatch Orgs (preprocessed)		19.2	11.1	7.4	4.0	19.2	25.9	14.8	14.8	22.2	16.7		15.5
*Number Mismatch Orgs: organisation appears at LEAST one time in the breakdowns													

Preprocessing:

- Reported periods of previous CDP reports were not considered, e.g., the following ranges were considered for 2010, 2011, and 2019:
 - 2010: From 01 January 2009 To 31 December 2010
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Transition Pathway Initiative Oil & Gas



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Test 1, Scope 1

Transition Pathway Initiative

Oil & Gas (Levels 1-4)

Transition Pathway Initiative: Oil & Gas (Levels 1-4, Scope 1)

Reported Global Emissions \neq Sum of Breakdowns

Mistakes on any breakdown between 2010 and 2019

	Organization	Country	Activity	Business	Facility	GHG	Region	Mismatch (Total)	Mismatch (Percentage)	TPI Level
1	Royal Dutch Shell	Netherlands	n/a	8/9	n/a	10/10	9/10	27/29	93.1%	4
2	PTT	Thailand	3/4	4/4	n/a	5/5	0/1	12/14	85.7%	3
3	Woodside Petroleum	Australia	0/1	n/a	2/2	3/3	3/5	8/11	72.7%	3
4	Occidental Petroleum Corporation	USA	n/a	3/3	n/a	3/7	5/9	11/19	57.9%	4
5	Cenovus Energy Inc.	Canada	3/7	1/7	1/2	7/8	n/a	12/24	50%	3
6	Neste Oil Oyj	Finland	4/7	3/8	7/8	2/7	2/8	18/38	47.4%	3
7	Devon Energy Corporation	USA	5/6	1/8	0/1	8/8	0/8	14/31	45.2%	3
8	Chevron Corporation	USA	1/3	4/8	n/a	2/8	2/8	9/27	33.3%	3
9	Oil & Natural Gas	India	n/a	0/2	n/a	2/2	0/2	2/6	33.3%	1
10	Marathon Oil Corporation	USA	n/a	0/2	n/a	2/3	0/1	2/6	33.3%	2
11	Ecopetrol Sa	Colombia	0/4	2/6	2/5	2/5	n/a	6/20	30%	3
12	Petrobras	Brazil	n/a	3/10	n/a	4/10	1/10	8/30	26.7%	4
13	Inpex Corporation	Japan	n/a	1/4	1/3	1/4	2/8	5/19	26.3%	4
14	Novatek	Russia	n/a	2/7	1/1	0/1	0/3	3/12	25%	3
15	eni	Italy	2/9	1/10	4/6	2/10	1/10	10/45	22.2%	4
16	Canadian Natural Resources Limited	Canada	n/a	1/6	n/a	2/3	1/10	4/19	21.1%	3
17	Lukoil OAO	Russia	0/1	n/a	n/a	0/2	1/2	1/5	20%	2



Organization	Country	Activity	Business	Facility	GHG	Region	Mismatch (Total)	Mismatch (Percentage)	TPI Level
18 BP	UK	n/a	2/8	n/a	1/8	1/8	4/24	16.7%	4
19 OMV AG	Austria	1/1	2/10	0/1	0/10	1/10	4/32	12.5%	4
20 Oil Search	Australia	n/a	n/a	0/4	1/5	0/2	1/11	9.1%	2
21 Repsol YPF	Spain	0/7	1/9	1/9	1/10	1/10	4/45	8.9%	4
22 Hess Corporation	USA	n/a	0/7	0/2	0/9	2/10	2/28	7.1%	4
23 Suncor Energy Inc	Canada	0/7	2/8	1/10	0/10	0/10	3/45	6.7%	3
24 EOG Resources Inc	USA	0/6	n/a	n/a	1/2	0/7	1/15	6.7%	2
25 Imperial Oil	Canada	n/a	1/7	n/a	0/8	0/1	1/16	6.3%	3
26 Exxon Mobil Corporation	USA	n/a	0/7	n/a	1/7	0/8	1/22	4.5%	3
27 ConocoPhillips	USA	n/a	1/10	n/a	0/10	0/10	1/30	3.3%	4
28 Equinor	Norway	n/a	0/9	1/2	0/10	0/9	1/30	3.3%	4
29 Formosa Petrochemical	Taiwan	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
30 PetroChina	China	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
31 Reliance Industries	India	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
32 TATNEFT	Russia	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
33 Concho Resources	USA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
34 Cabot Oil & Gas	USA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
35 Diamondback Energy	USA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
36 HollyFrontier	USA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2



Organization	Country	Activity	Business	Facility	GHG	Region	Mismatch (Total)	Mismatch (Percentage)	TPI Level
37 Ovintiv	Canada	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
38 Phillips 66	USA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
39 Pioneer Natural Resource	USA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
40 Saudi Aramco	Saudi Arabia	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
41 Marathon Petroleum	USA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
42 Valero Energy	USA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
43 China Petroleum & Chemical	China	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3
44 Eneos (Oil & Gas)	Japan	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3
45 Gazprom	Russia	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3
46 Rosneft Oil	Russia	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3
47 SK Innovation	South Korea	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3
48 Santos	Australia	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3
49 Sasol (Oil & Gas)	South Africa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4
50 Galp Energia SA	Portugal	0/2	0/6	n/a	0/8	0/8	0/24	0%	4
51 Total	France	n/a	0/8	n/a	0/8	0/8	0/24	0%	4
52 Apache Corporation	USA	0/3	n/a	n/a	0/6	0/6	0/15	0%	3
53 Noble Energy Inc	USA	0/6	n/a	n/a	n/a	0/6	0/12	0%	2
54 CNOOC	China	n/a	n/a	0/1	0/1	0/2	0/4	0%	2





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Thank you for your attention: we would love
to learn from your comments & questions

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