

CASE STUDY: TRACKING YOUR EMISSIONS: CORPORATE GHG ACCOUNTING AND REPORTING

Optimus Auto Components is one of the leading manufacturer of auto components, having a manufacturing plant in Mumbai. The company is in initial phase of GHG emission accounting and has hired you as a GHG expert. The company has asked you to develop GHG emission profile of the company and help it with target setting process for the next year. The data shared by the company highlights Scope 1 and Scope 2 emission related data for the last 3 years and Scope 3 emission related data for the last 1 year.

Objective/Deliverables	
1	Identification of the categories of Scope 1, Scope 2 and Scope 3 emissions based on the data provided in the subsequent sheets
2	Accounting of scope 1, scope 2, and scope 3 emissions (emission factors to be used are shared in the last sheet) Scope 1 & Scope 2 emissions for the last three years Scope 3 emission for last one year
3	Calculation of GHG emission intensity i.e. tons CO ₂ / ton of production of combined Scope 1 and Scope 2 emission
4	Reduction of GHG emission intensity of Scope 1 and Scope 2 emissions in the last three years
5	What type of targets a company should set? And why?
6	Suggest GHG emission reduction plan (Recommendations to reduce GHG emission in coming years)
Instructions for submission	
1	The submission of the case study is not COMPULSORY . However, we strongly encourage you to work on it and share the report. This will bolster your concepts on GHG accounting and give you insights about GHG emission accounting methodology.
2	The report can be submitted in the word/ppt format. Word file of about maximum 2 pages or a presentation of about 7-8 slides. You can make maximum use of tables/charts to depict the results.
3	Avoid writing long paragraphs, simple bullets points should be sufficient.

PRODUCTION DATA

NOTE: The plant manufactures auto components and measures the output in terms of the total weight of the final product. The details of the production data are given below

Production Data (in Metric Tons)			
Month	2017-18	2018-19	2019 - 20
April	323	324	342
May	325	331	349
June	318	332	350
July	313	342	349
August	313	321	351
September	313	342	353
October	314	342	349
November	310	330	342
December	321	327	355
January	310	332	354
February	291	309	339
March	293	301	341

ELECTRICITY CONSUMPTION DATA

Total Electricity (from grid, solar power and DG set) consumed by the plant in kWh			
Month	2017-18	2018-19	2019 - 20
April	52340	53023	54392
May	52057	53094	55984
June	60947	59068	60197
July	57038	58094	58172
August	52713	53047	52874
September	55024	57001	56298
October	52839	54094	54198
November	53997	54983	56023
December	58203	59328	59287
January	57393	58093	58264
February	48093	49023	50124
March	50293	51346	52983

Solar power generated from 100 kW rooftop panels (kWh)			
Month	2017 - 18	2018 - 19	2019-20
April	-	-	14239
May	-	-	13204
June	-	-	11024
July	-	-	10934
August	-	-	9820
September	-	8900	8704
October	-	9420	9673
November	-	10294	9981
December	-	11034	10957
January	-	13093	12305
February	-	14064	14048
March	-	13245	14530

Electricity generated from DG Set (kWh)			
Month	2017 - 18	2018 - 19	2019-20
April	235	-	-
May	253	212	198
June	-	143	-
July	-	-	-
August	146	256	-
September	189	-	-
October	-	253	-
November	-	153	162
December	-	-	-
January	325	-	214
February	-	-	230
March	-	-	-

DIESEL CONSUMPTION

Note: Plant uses Diesel mainly for their forklifts and is used in DG set, which is kept as a power back up

Diesel consumption in litres						
Month	2017 - 18		2018-19		2019-20	
	for forklift	for DG set	for forklift	for DG set	for forklift	for DG set
April	368	59	321	0	328	0
May	323	64	336	56	327	52
June	349	0	363	37	357	0
July	316	0	325	0	319	0
August	319	38	289	64	327	0
September	326	48	208	0	378	0
October	364	0	356	65	318	0
November	356	0	329	40	328	43
December	325	0	319	0	368	0
January	309	83	376	0	356	55
February	301	0	356	0	329	59
March	297	0	317	0	389	0

COAL CONSUMPTION

Note: Coal is burnt in the boiler. The plant procures coal from mines by the truck, the coal consumption details are mentioned below.

Coal Consumption in Tons									
Month	2017 - 18			2019 - 19			2019 - 20		
	Opening Stock	Tons of coal procured	Closing Stock	Opening Stock	Tons of coal procured	Closing Stock	Opening Stock	Tons of coal procured	Closing Stock
April	487	300	462	432	325	426	344	325	335
May	462	275	418	426	300	401	335	325	329
June	418	300	410	401	325	414	329	325	328
July	410	325	408	414	300	385	328	300	301
August	408	300	392	385	275	342	301	325	297
September	392	300	361	342	300	308	297	350	329
October	361	325	361	308	325	306	329	325	335
November	361	350	385	306	300	287	335	325	332
December	385	275	342	287	350	311	332	350	356
January	342	350	377	311	300	290	356	300	339
February	377	350	420	290	350	310	339	300	320
March	420	325	432	310	350	344	320	325	318

NATURAL GAS CONSUMPTION

Note: Plant consumes PNG through a pipeline from GAIL for their heat treatment oven. The consumption of PNG is as mentioned below:

Consumption of PNG in SCM			
Month	2017-18	2018-19	2019 - 20
April	1593	1599	1616
May	1523	1604	1608
June	1575	1615	1645
July	1498	1598	1636

August	1510	1584	1628
September	1509	1624	1598
October	1502	1619	1589
November	1493	1596	1578
December	1597	1587	1603
January	1519	1629	1618
February	1498	1567	1569
March	1501	1578	1602

CONSUMABLES

Note: For welding operations, plant uses different diffuser gases. Two of which (CO2 and Acetylene) contributes to GHG emissions. The details of these gases are as mentioned below.

Sizes of the cylinders:

1 cylinder of CO2 = 45 kg

1 cylinder of Acetylene = 47 kg

Density of acetylene - 1.1kg /m3

Month	2017 - 18		2018 - 19		2019 - 20	
	No of CO2 cylinders	No of Acetylene Cylinders	No of CO2 cylinders	No of Acetylene Cylinders	No of CO2 cylinders	No of Acetylene Cylinders
April	4	2	4	2	4	2
May	4	2	4	2	4	3
June	3	2	4	2	3	1
July	4	1	4	2	4	2
August	4	1	5	3	4	3
September	3	2	4	2	5	3
October	4	1	4	2	5	2
November	3	2	3	1	4	2
December	3	2	4	2	4	2
January	4	2	4	2	5	1
February	3	1	3	2	4	2
March	3	1	3	1	4	2

EMPLOYEES COMMUTE

As per your suggestion to account for Scope 3 emissions, the HR team of the plant conducted a survey to identify the mode of transport used by employees and average distance travelled by them. The consolidated details for 2019-20 are as mentioned below.

Mode of transport		No of employees using 2 wheeler	No of employees using 4 wheeler petrol	No of employees using 4 wheeler diesel
Average daily travel (to & from) in kms	5 kms	80	7	8
	10 kms	60	2	15
	20 kms	40	8	5
	30 kms	0	10	15
Mileage				
2-wheeler		40 kms / litre		

4-wheeler petrol	15 kms/ litre		
4-wheeler diesel	12 kms / litre		
No of working days in 2019-20	300		

UPSTREAM TRANSPORTATION

As per your suggestion to account for Scope 3 emissions, the purchase team of the plant took initiatives to compile the data on mode of transport, average distance, number of trips carried out to procure the raw materials. The consolidated details for the year 2019-20 are as mentioned below

	Distance travelled per trip to and fro	Quantity of raw material per trip	No of trips in a year	Type of vehicle used
Raw material 1	400	15	300	Heavy Duty truck - Diesel Operated
Raw material 2	200	15	100	Heavy Duty truck - Diesel Operated
Coal	1000	15	240	Heavy Duty truck - Diesel Operated
Consumables	100	5	500	Light Duty truck - Diesel Operated

DOWNSTREAM TRANSPORTATION

As per your suggestion to account for Scope 3 emissions, the purchase team of the plant took initiatives to compile the data on mode of transport, average distance, number of trips carried out to transport the products. The consolidated details for the year 2019-20 are as mentioned below

	Distance travelled per trip (to and fro)	Quantity of raw material per trip	No of trips in a year	Type of vehicle used
Product (components)	100	15	120	Heavy Duty truck - Diesel Operated
	250	15	75	Heavy Duty truck - Diesel Operated
	500	15	85	Heavy Duty truck - Diesel Operated

EMISSION FACTORS

The emission factors identified from various sources are as mentioned below.

Fuels/source	Emission factors	Unit
Electricity consumption	0.83	kg CO2 eq/kWh
Diesel	2.65	kg CO2 eq /litres
Coal	1.643	tons CO2 eq/ ton of coal
Natural Gas	1.9141	kg CO2 eq/SCM
Acetylene	3.884	kg CO2 eq/m3
4-wheeler Car - Petrol Consuming	0.153	kg CO ₂ /km
4-wheeler Car - Diesel Consuming	0.177	kg CO ₂ /km
2-wheeler	0.0458	kg CO ₂ /km
Heavy Duty truck > 12 T	0.7375	kg CO2 / km
Light Duty truck	0.307	kg CO2 / km