Lessons Learned from Scope 3 Reporting POC

David Shackleton - Schlumberger, and Chair PIDX Business Processes Work Group
Chris Welsh – Chair ETDX Project Team, PIDX COO
James Thompson – ConocoPhillips Sr. IT Process Consultant, ETDX Member
GLOBAL TARGETS

2015
195 countries adopted the Paris Climate Agreement to reduce global warming and build resilience to climate change. To avoid worst-case climate change, it’s vital to limit warming to no more than 1.5 degrees Celsius.

2015-2017
Parties to the agreement began submitting climate action plans known as nationally determined contributions (NDCs). Initial commitments, even if fully implemented, would only be enough to slow warming to 3 degrees. Urgent calls for action and ambition gained momentum as the plans would not stop catastrophic impacts.

2020-2021
In the buildup to the COP26 climate talks, countries have begun revising their NDCs to strengthen climate actions. With science affirming a shrinking window of opportunity, the plan must include urgent actions to cut carbon emissions and reach net zero by 2050.

2030
To keep warming to 1.5 degrees, countries must cut emissions by at least 45 percent compared to 2010 levels.

2050
The transition to net-zero emissions must be fully complete.

What are the different Emissions Scopes?

* Source Carbon Trust

<table>
<thead>
<tr>
<th>Scope 1</th>
<th>Scope 2</th>
<th>Scope 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel combustion</td>
<td>Purchased electricity, heat and steam</td>
<td>Purchased goods and services</td>
</tr>
<tr>
<td>Company vehicles</td>
<td></td>
<td>Business travel</td>
</tr>
<tr>
<td>Fugitive emissions</td>
<td></td>
<td>Employee commuting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waste Disposal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of sold products</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transportation and distribution (up- and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>downstream)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Investments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leased assets and franchises</td>
</tr>
</tbody>
</table>
What are the different Emissions Scopes?
What are the different Emissions Scopes?

**EMISSIONS REPORTING CONTEXT**

Schlumberger Emissions 2019 – CO₂e Tonnes

Schlumberger 2019 Emissions
55 MT CO₂e

**Scope 1**
1,416,000 T

**Scope 2**
760,000 T

**Scope 3**
52,450,000 T

**Others**
31%

**Chemicals, Minerals**
34%

**Cement**
7%

**Metals, Metal components**
28%

**Purchased good and services**
6,265,681

**Capital goods**
104,860

**Fuel and energy related activities**
115,101

**Upstream transportation and distribution**
1,782,926

**Waste generated in operations**
100,756

**Business travel**
159,659

**Employee commuting**
100,000

**Upstream leased assets**
935,213

**Downstream transportation and distribution**
2,000

**Process of sold products**
negligible

**Use of sold products/services**
39,950,588

**End-of-life treatment of Sold products**
640,000

**Downstream leased assets**
1,489,130

**Franchises**
negligible

**1,804,615**
1. TOP DOWN

What are ‘science-based targets’?

Science-based targets provide a clearly-defined pathway for companies to reduce greenhouse gas (GHG) emissions, helping prevent the worst impacts of climate change and future-proof business growth.

Targets are considered ‘science-based’ if they are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement – limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C.

*https://sciencebasedtargets.org/how-it-works

Accountancy Based

Looks as Total Spend and Apportions to Revenue

Sample Calculation

Spend = $20BN x GHG Industry Factor = 5 Mega-Tons

Sales to Customer 1 = 20% of Revenue

Emissions Reporting for Customer 1 = 1 Mega Ton CO2e
2. BOTTOMS UP

What is Bottoms Up reporting?

Line-item Emissions reporting of products and services and their measured emissions as calculated by a verifiable method.

Requires the Supplier to perform life-cycle measurements such as the GHG Protocol “Cradle-to-Gate” measurement process and send these emissions on a per product or service basis to the Buyer.

Buyer aggregates the line-item emissions to create a complete picture of their Scope 3 Emissions.
ORCHESTRATION OF SUPPLY CHAIN MESSAGES

**Operator (Buyer)**
- Sourcing RFI/RFP
- Master Data Management
- Contract Management
- Catalogs
- Request for Quote
- Purchase Requisition
- Purchase Order
- Goods Receipt/Service Entry
- Field Ticket Response
- Invoice Response
- Payment Remittance Advice

**Supplier**
- Bid Response
- Catalog Data
- Quote Provided
- PO Change/Confirmation
- Field Ticket/Delivery
- Invoice
- Payment Received
TWO APPROACHES

2. BOTTOMS UP

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PETROLEUM INDUSTRY DATA DICTIONARY

UNSPSC Code 20 12 14 17

PIDX PIDD HANGER:LINER

PIDX PIDD Detailed Attributes

Workgroup to extend PIDX PIDD for GHG

| Attribute 1 | TYPE          |
| Attribute 2 | LINER SIZE    |
| Attribute 3 | CASING SIZE   |
| Attribute 4 | CASING WEIGHT |
| Attribute 5 | LENGTH        |
| Attribute 6 | MAXIMUM OD    |
| Attribute 7 | MODEL DESIGNATION |
| Attribute 8 | MATERIAL      |
| Attribute 9 | SETTING PRESSURE |
| Attribute 10| TOP CONNECTION |
| Attribute 11| BOTTOM CONNECTION |
| Attribute 12| SPECIAL FEATURES |
| Attribute 13| APPLICATION   |
| Attribute 14| Product GHG (Cradle to Gate) |
| Attribute 15| Operational GHG |
| Attribute 16| Service GHG    |
| Attribute 17| Emission Uncertainty |
| Attribute 18| Emission Methodology |
| Attribute 19| Emission Verification & Validity |
| Attribute 20| Scope and Category |
# Emissions Data for Products and Services (Scope 3 Category 1)

<table>
<thead>
<tr>
<th>#</th>
<th>Attribute</th>
<th>Unit</th>
<th>Notes / References</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Product GHG Emission (cradle-to-gate)</td>
<td>kg CO₂e</td>
<td>Upon purchase of the product, this attribute is expected to become part of the purchasing company’s upstream scope 3 emissions.</td>
</tr>
<tr>
<td>15</td>
<td>Operational GHG Emission</td>
<td>kg CO₂e / [time]</td>
<td>This attribute is a guide to the expected emissions in the use of the product. This could be a URL, provided for reference – detail of ranges, real case studies, etc.</td>
</tr>
<tr>
<td>16</td>
<td>Service GHG Emission</td>
<td>e.g., kg CO₂e / hour</td>
<td>This attribute expected for services. What are emissions for this service? Per day, per hour, per whatever unit the service is provided.</td>
</tr>
<tr>
<td>17</td>
<td>Emission Uncertainly</td>
<td>%</td>
<td>An estimate of how certain the company is of the value in Attribute #14 / #16</td>
</tr>
<tr>
<td>18</td>
<td>Emission Methodology</td>
<td>String</td>
<td>A description of/reference to the methodologies used to quantify emissions in Attribute #14 / #16, and a description of the data sources used (including emission factors and GWP values), e.g., ARS¹.</td>
</tr>
<tr>
<td>19</td>
<td>Emission Verification &amp; Validity</td>
<td>String</td>
<td>Entity that has verified and/or validated emissions, based on ISO 14064-3:2019</td>
</tr>
<tr>
<td>20</td>
<td>Scope &amp; Category</td>
<td>Limited List</td>
<td>To give a suggestion to the buyer as to which scope and scope category of the emission, e.g., Scope 3, Category 1 – Goods and Services.</td>
</tr>
</tbody>
</table>
1. Define the way the Operator can request Emissions Data on the OrderCreate document, what data and at what granularity?

2. Define the way the Supplier can transmit Emissions Data on the Invoice document, what data and what reference scheme?
START

Require 3 Drill Bits for Well B-28, Send Order to Supplier

PIDX OrderCreate

Request for Manufactured Emissions Data

Drilling Related Emissions to be Captured and Sent to Operator

3 Drill Bits

Drill Well B-28

3 Drill Bits

Transport Related Emissions to be Captured and Sent to Operator

Receive Invoice, Check Delivery, Pay Invoice [Store Emissions Data]

END

PIDX Invoice

Receive Order, Manufacture Drill Bits [Record Total Manufactured Emissions per Serialized Drill Bit]

Ship Drill Bits to Driller

Invoice Operator

Send Manufacturing Emissions Data per Drill Bit

End of use case

Well B-28 Drilled

Receive Invoice, Check Delivery, Pay Invoice [Store Emissions Data]
1: <?xml version="1.0" encoding="UTF-8"?>
2: <Invoice xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
3: xsi:schemaLocation="http://www.pidx.org/schemas/v1.7 ... http://www.pidx.org/schemas/v1.7"
4: pidx:version="1.7" pidx:transactionPurposeIndicator="Original">
5:   <pidx:InvoiceProperties> [176 lines]
6:     <pidx:InvoiceDetails>
7:       <pidx:InvoiceLineItem>
8:         <pidx:LineItemNumber>1</pidx:LineItemNumber>
9:         <pidx:InvoiceQuantity> [3 lines]
10:       <pidx:LineItemInformation>
11:         <pidx:LineItemIdentifier>identifierIndicator="AssignedBySeller">PortNumber:001</pidx:LineItemIdentifier>
12:         <pidx:LineItemName>GP BIT 01, 52-ZK XY2737/01</pidx:LineItemName>
13:         <pidx:LineItemDescription>Speed Bit 01 Series XY2737/01</pidx:LineItemDescription>
14:         <pidx:ManufacturerIdentifier>Serial:001</pidx:ManufacturerIdentifier>
15:       </pidx:LineItemInformation>
16:       <pidx:FieldTicketInformation> [2 lines]
17:         <pidx:PartnerInformation partnerRoleIndicator="ShipToParty"> [11 lines]
18:         <pidx:PartnerInformation partnerRoleIndicator="ShipFromParty"> [11 lines]
19:       <pidx:JobLocationInformation> [9 lines]
20:       <pidx:Pricing> [10 lines]
21:       <pidx:Tax> [21 lines]
22:       <pidx:LineItemTotal> [3 lines]
23:       <pidx:ServiceDateTime dateTypeIndicator="ShippedDate" [1 line]
24:         <pidx:ServiceDateTime dateTypeIndicator="ServicePeriodStart" [1 line]
25:         <pidx:ServiceDateTime dateTypeIndicator="ServicePeriodEnd" [1 line]
26:         <pidx:ReferenceInformation referenceInformationIndicator="DeliveryTicketNumber"> [3 lines]
27:         <pidx:Comment> Job Summary: BSN, Norway VANSJANGER</pidx:Comment>
28:       </pidx:EmissionsData>
29:     <pidx:EmissionProductGHGQuantity>
30:       <Quantity>60</Quantity>
31:       <UnitOfMeasureCode>KG CO2e</UnitOfMeasureCode>
32:     </pidx:EmissionProductGHGQuantity>
33:   </pidx:InvoiceLineItem>
34:   <pidx:InvoiceLineItem> [107 lines]
35:   <pidx:InvoiceLineItem> [106 lines]
36: </pidx:InvoiceDetails>
37: <pidx:InvoiceSummary> [18 lines]
38: </Invoice>
### Scope 3 GHG emissions [A] [B]

<table>
<thead>
<tr>
<th>Category</th>
<th>Unit</th>
<th>2021</th>
<th>2020</th>
<th>2019</th>
<th>2018</th>
<th>2017</th>
<th>IPECA</th>
<th>SASB</th>
<th>GRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchased goods and services (Category 1)</td>
<td>million tonnes CO₂eq</td>
<td>147</td>
<td>147</td>
<td>178</td>
<td>190</td>
<td>186</td>
<td>CCE-4</td>
<td>--</td>
<td>320-3</td>
</tr>
<tr>
<td>Fuel and energy-related activities (not included in Scope 1 or Scope 2) (Category 2)</td>
<td>million tonnes CO₂eq</td>
<td>136</td>
<td>103</td>
<td>102</td>
<td>96</td>
<td>87</td>
<td>CCE-4</td>
<td>--</td>
<td>320-3</td>
</tr>
<tr>
<td>Downstream Transportation and Distribution (Category 9)</td>
<td>million tonnes CO₂eq</td>
<td>6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>320-3</td>
</tr>
<tr>
<td>Use of sold products (Category 11)</td>
<td>million tonnes CO₂eq</td>
<td>1,910</td>
<td>1,054</td>
<td>1,271</td>
<td>1,351</td>
<td>1,318</td>
<td>CCE-4</td>
<td>--</td>
<td>320-3</td>
</tr>
<tr>
<td>Own production (G6)</td>
<td>million tonnes CO₂eq</td>
<td>380</td>
<td>452</td>
<td>554</td>
<td>594</td>
<td>582</td>
<td>CCE-4</td>
<td>--</td>
<td>320-3</td>
</tr>
<tr>
<td>Third-party products (H9)</td>
<td>million tonnes CO₂eq</td>
<td>630</td>
<td>602</td>
<td>708</td>
<td>757</td>
<td>736</td>
<td>CCE-4</td>
<td>--</td>
<td>320-3</td>
</tr>
</tbody>
</table>

---

### 2020 GHG Emissions Reported by Category (metric tonnes of CO₂eq)

<table>
<thead>
<tr>
<th>Scope</th>
<th>Emissions</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1 (Direct) Emissions</td>
<td>1,973,000</td>
<td>Manufacturing process, onsite fuel combustion, refrigerants, onsite fixed/air transport.</td>
</tr>
<tr>
<td>Scope 2 (Indirect, Electricity)</td>
<td>509,000</td>
<td>Market-based method includes renewable energy purchases.</td>
</tr>
<tr>
<td>Scope 1 and 2 Total</td>
<td>2,482,000</td>
<td></td>
</tr>
<tr>
<td>Scope 3 Total</td>
<td>29,866,000</td>
<td>Indirect/value chain.</td>
</tr>
<tr>
<td>Leased Vehicles and Commuting</td>
<td>298,000</td>
<td>Employee leased vehicles and commuting.</td>
</tr>
<tr>
<td>Logistics and Distribution</td>
<td>189,000</td>
<td>Upstream and downstream transport and distribution.</td>
</tr>
<tr>
<td>Employee Business Travel</td>
<td>24,000</td>
<td>Air travel, car rentals, and hotel stays.</td>
</tr>
<tr>
<td>Supply Chain</td>
<td>4,464,000</td>
<td>Represents the 2020 estimate based on key suppliers’ 2020 COP Climate Change Questionnaire information.</td>
</tr>
<tr>
<td>Capital Goods</td>
<td>93,000</td>
<td>Extraction, production, and transport of capital goods purchased.</td>
</tr>
<tr>
<td>Fuel and Energy Related Activities</td>
<td>93,000</td>
<td>Impacts related to extraction, production, and transportation of fuels and energy purchased, not already included in Scope 1 or 2. Market-based method!</td>
</tr>
<tr>
<td>Waste Generated in Operations</td>
<td>7,000</td>
<td>Disposal and treatment of waste generated in our operations.</td>
</tr>
<tr>
<td>Product Energy Usage</td>
<td>24,407,000</td>
<td>Represents the GHG emissions of the product lifetime (1,556,000 metric tonnes of CO₂eq annualized).</td>
</tr>
<tr>
<td>Processing of Sold Products</td>
<td>271,000</td>
<td>Processing of intermediate products sold to downstream manufacturers.</td>
</tr>
</tbody>
</table>

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### Additional Notes

1. The values in this table reflect estimated Scope 3 emissions included in our net carbon intensity. This excludes certain contracts held for trading purposes and reported net rather than gross. Business-specific methodologies to net volumes have been applied to all products and pipelines gas and power. Paper trades that do not result in physical product delivery are excluded. Retail sales volumes from markets where Shell operates under trademark licensing agreements are also excluded from the scope of Shell’s carbon intensity metrics.
2. Estimated emissions from other Scope 3 categories are published on a quarterly basis. 2021 data will be available in June 2022.
3. This category includes estimated well-to-tank emissions from purchased/third-party refined oil products, natural gas, LNG, crude oil, and biofuels.
4. This category includes estimated well-to-wagon emissions from generation of purchased power included in our net carbon intensity.
5. Estimated emissions from transportation and distribution of sold own products, LNG, GTL, natural gas, and biofuels.
6. This category includes estimated emissions from scope of our refineries, producers, natural gas, LNG and GTL products.
7. Estimated as the difference between own production and total sold products.

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DATA RAMP UP AND CONVERSION

Summary Reporting (Top Down)

Detailed Line Item (Bottoms Up)

Increasing Move from Calculation to Measurement

Increasing Level of Reporting from Facilities to Product and Service Line Items

Amount of Data

2022  2024  2026  2028  2030
“Today, carbon accounting suffers from data quality issues, measurement and reporting inconsistencies, siloed platforms, and infrastructure challenges. This makes it difficult to compare, combine and share reliable data, particularly for companies.”

*The Carbon Call – Feb 10, 2022*
ORCHESTRATION OF SUPPLY CHAIN MESSAGES

Operator (Buyer)

<table>
<thead>
<tr>
<th>Purchase-2-Pay</th>
<th>Order-2-Cash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sourcing RFI/RFP</td>
<td>Bid Response</td>
</tr>
<tr>
<td>Master Data Management</td>
<td></td>
</tr>
<tr>
<td>Contract Management</td>
<td></td>
</tr>
<tr>
<td>Catalogs</td>
<td>Catalog Data</td>
</tr>
<tr>
<td>Request for Quote</td>
<td>Quote Provided</td>
</tr>
<tr>
<td>Purchase Requisition</td>
<td></td>
</tr>
<tr>
<td>Purchase Order</td>
<td></td>
</tr>
<tr>
<td>Goods Receipt/Service Entry</td>
<td>PO Change/Confirmation</td>
</tr>
<tr>
<td>Field Ticket Response</td>
<td>Field Ticket/Delivery</td>
</tr>
<tr>
<td>Invoice Response</td>
<td>Invoice</td>
</tr>
<tr>
<td>Payment Remittance Advice</td>
<td>Payment Received</td>
</tr>
</tbody>
</table>

Supplier
THERE IS A CLEAR PATH - STANDARDS

Define Standard Reporting Data – OpenFootprint
Develop Standard Data Exchange – PIDX
POC BETWEEN OPERATOR AND BUYER

Operator (Buyer)

- Sourcing RFI/RFP
- Master Data Management
- Contract Management
- Catalogs
- Request for Quote
- Purchase Requisition
- **Purchase Order**
  - Goods Receipt/Service Entry
  - Field Ticket Response
- Invoice Response
- Payment Remittance Advice

Supplier

- **Order-2-Cash**
  - Bid Response
- Catalog Data
  - Quote Provided
- PO Change/Confirmation
- Field Ticket/Delivery
- Invoice
- Payment Received
## POC BETWEEN OPERATOR AND SERVICE CO.

<table>
<thead>
<tr>
<th>Column C</th>
<th>UoM</th>
<th>14</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>KG CO₂e per KG of product</td>
<td>%</td>
<td>Emission Methodology</td>
<td>Emission Verification &amp; Validity</td>
<td>Scope &amp; Category</td>
<td></td>
</tr>
<tr>
<td>BARITE 4.1</td>
<td>not provided</td>
<td>0.180</td>
<td>84%</td>
<td>IPCC 2007 (AR4)</td>
<td>None</td>
<td>Scope 3</td>
<td>Category 1</td>
</tr>
<tr>
<td>BENTONITE EXTENDER</td>
<td>not provided</td>
<td>0.279</td>
<td>89%</td>
<td>IPCC 2007 (AR4)</td>
<td>None</td>
<td>Scope 3</td>
<td>Category 1</td>
</tr>
<tr>
<td>CALCIUM CARBONATE D151-10</td>
<td>not provided</td>
<td>N/A</td>
<td>N/A</td>
<td>GWP: IPCC 2013</td>
<td>According to ISO 14025:2006, PCR. Micronized stone from quarry-UN CPC 15200, 15320</td>
<td>Scope 3</td>
<td>Category 1</td>
</tr>
<tr>
<td>CLASS C CEMENT</td>
<td>not provided</td>
<td>N/A</td>
<td>N/A</td>
<td>GWP100, EN 15804 Version: August 2021</td>
<td>as per ISO 14025 and EN 15804+42</td>
<td>Scope 3</td>
<td>Category 1</td>
</tr>
<tr>
<td>CEMENT, CLASS A</td>
<td>not provided</td>
<td>N/A</td>
<td>N/A</td>
<td>U S EPA TRACI v2.1 IPCC: 2013 (AR 5)</td>
<td>According to ISO 14025:2006, ISO 21930:2017 (the core PCR) and the NSF product category rules for Portland, Blended, Masonry, Mortar and Plastic (Stucco) Cements (subcategory PCR)</td>
<td>Scope 3</td>
<td>Category 1</td>
</tr>
</tbody>
</table>

### Data source comments:
- Cement Class A is supplier’s data (single supplier - single plant - US location)
- Cement Class C are supplier’s data (single supplier - single plant - Germany location)
- Lime is supplier’s data (single supplier - single plant - Australia location)
- Calcium Carbonate is supplier’s data (single supplier - single plant - Italy location)
- Product packaging not included in CO₂e factor

### Other findings:
- List provided has line-items without UoM
- List provided contain fluids (product blends) without fluid density reference
POC Successful

5000+ purchases
$14million+
Carbon footprint of around 3 million kg CO2e
Challenges

• Carbon footprint information is complex
  • UOMs
  • different facilities
• Need more Product Category Rules for O&G
• Sensitive information
• Some companies may not have the platform to exchange the info
Next steps

- Use draft PIDX schema to exchange data
- Involve other service companies and buyers
- Apply to other scope 3 categories
- Review compatibility with other standards – OFP, WBCSD, etc.
Please get involved!

Questions or Comments?

Lessons Learned from Scope 3 Reporting POC

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