PIDX™
EMISSIONS TRANSPARENCY

Lessons Learned from Scope 3 Reporting POC

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GLOBAL TARGETS

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2015

196 countries adopted the historic Paris Agreement to reduce global warming and build resilience to climate change. Its overall goal: limit warming to no more than 1.5 degrees Celsius.

2020-2021

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

100

80

60

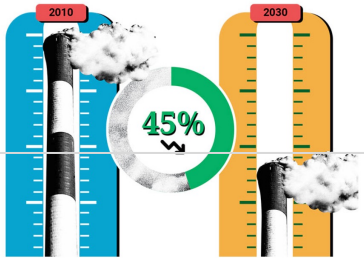
40

20

0

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.



2030

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

2050

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

2015 2017 2020 2030 2040 2050

Source: https://www.un.org/en/climatechange/net-zero-coalition

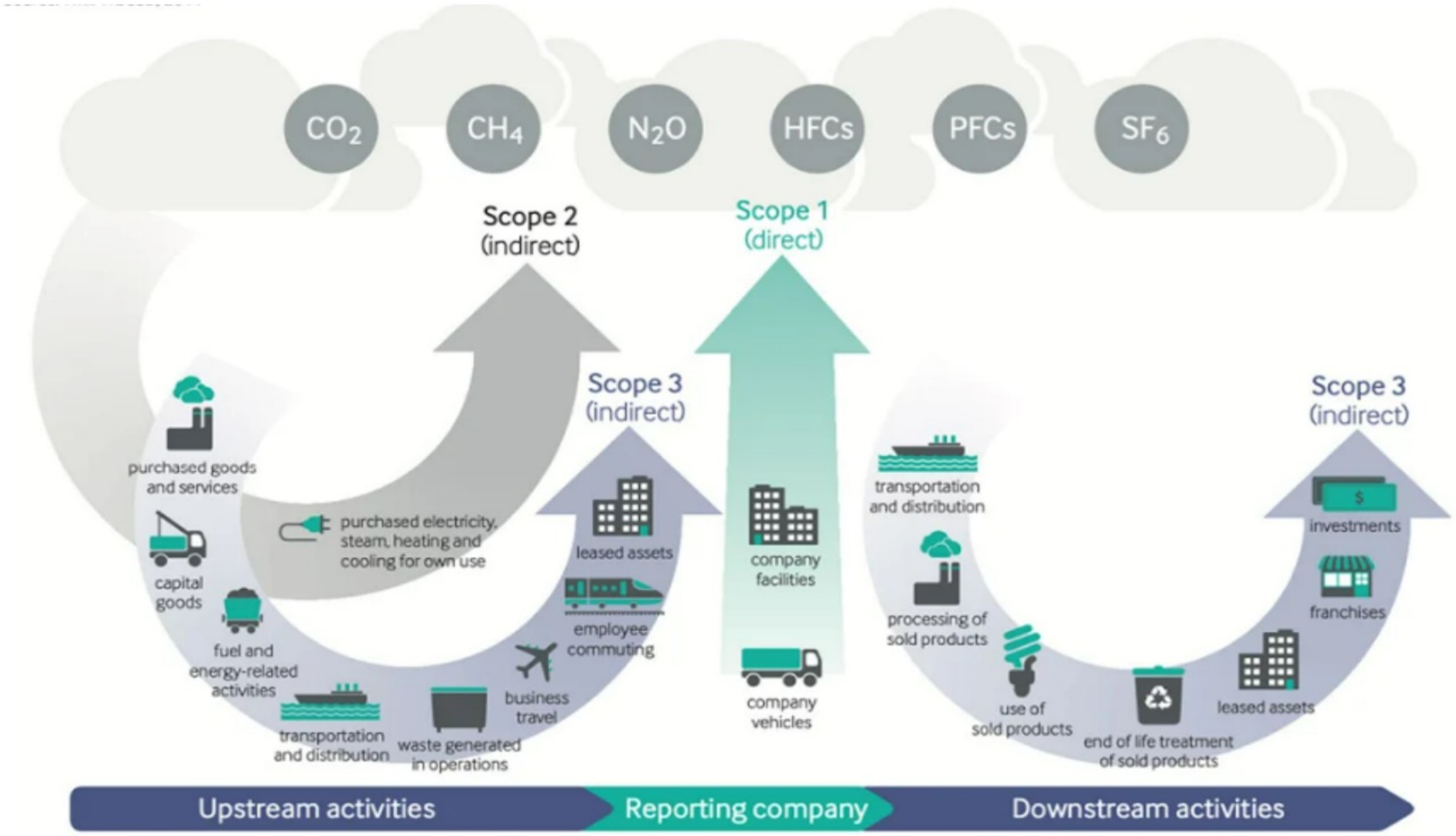
EMISSIONS REPORTING CONTEXT

What are the different Emissions Scopes?

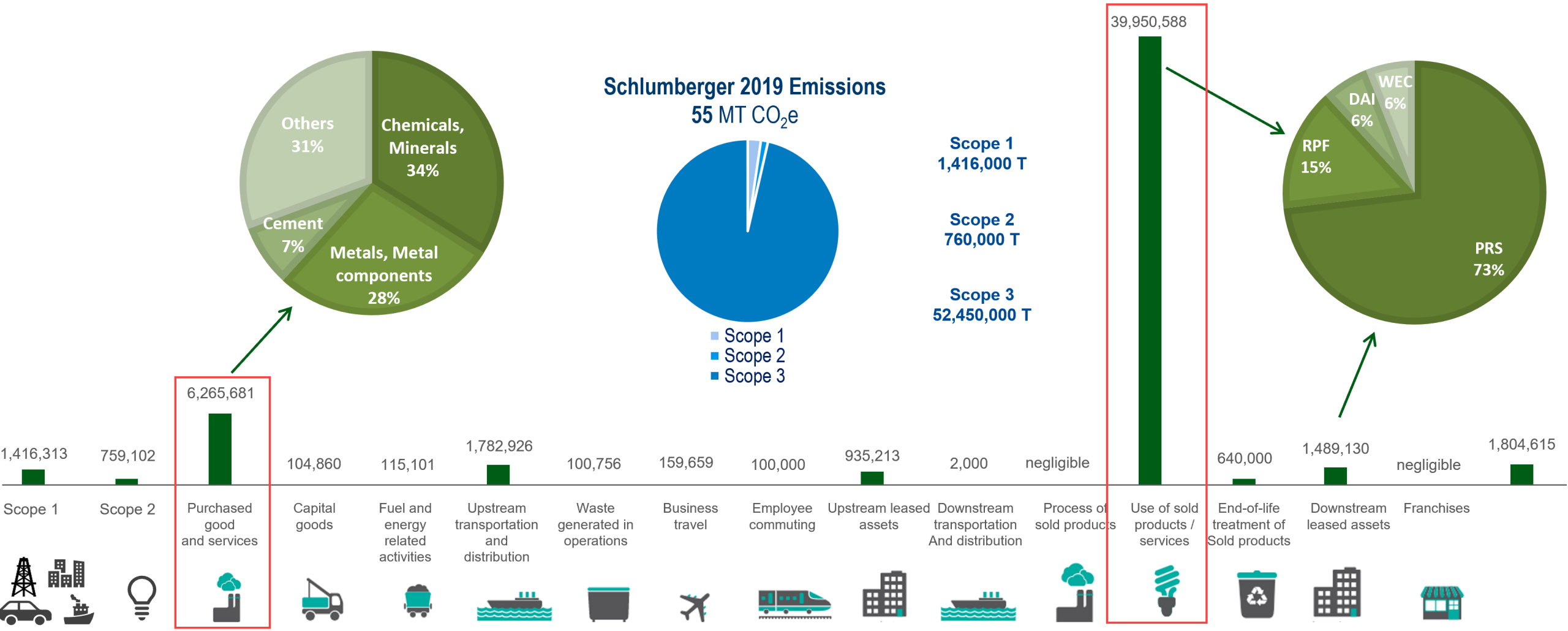
* Source Carbon Trust

Scope 1	Scope 2	Scope 3
Fuel combustion Company vehicles Fugitive emissions	Purchased electricity, heat and steam	Purchased goods and services Business travel Employee commuting Waste Disposal Use of sold products Transportation and distribution (up- and downstream) Investments Leased assets and franchises

EMISSIONS REPORTING CONTEXT



Schlumberger Emissions 2019 – CO_2e Tonnes



TWO APPROACHES

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

SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

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 CO_2e

TWO APPROACHES

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.

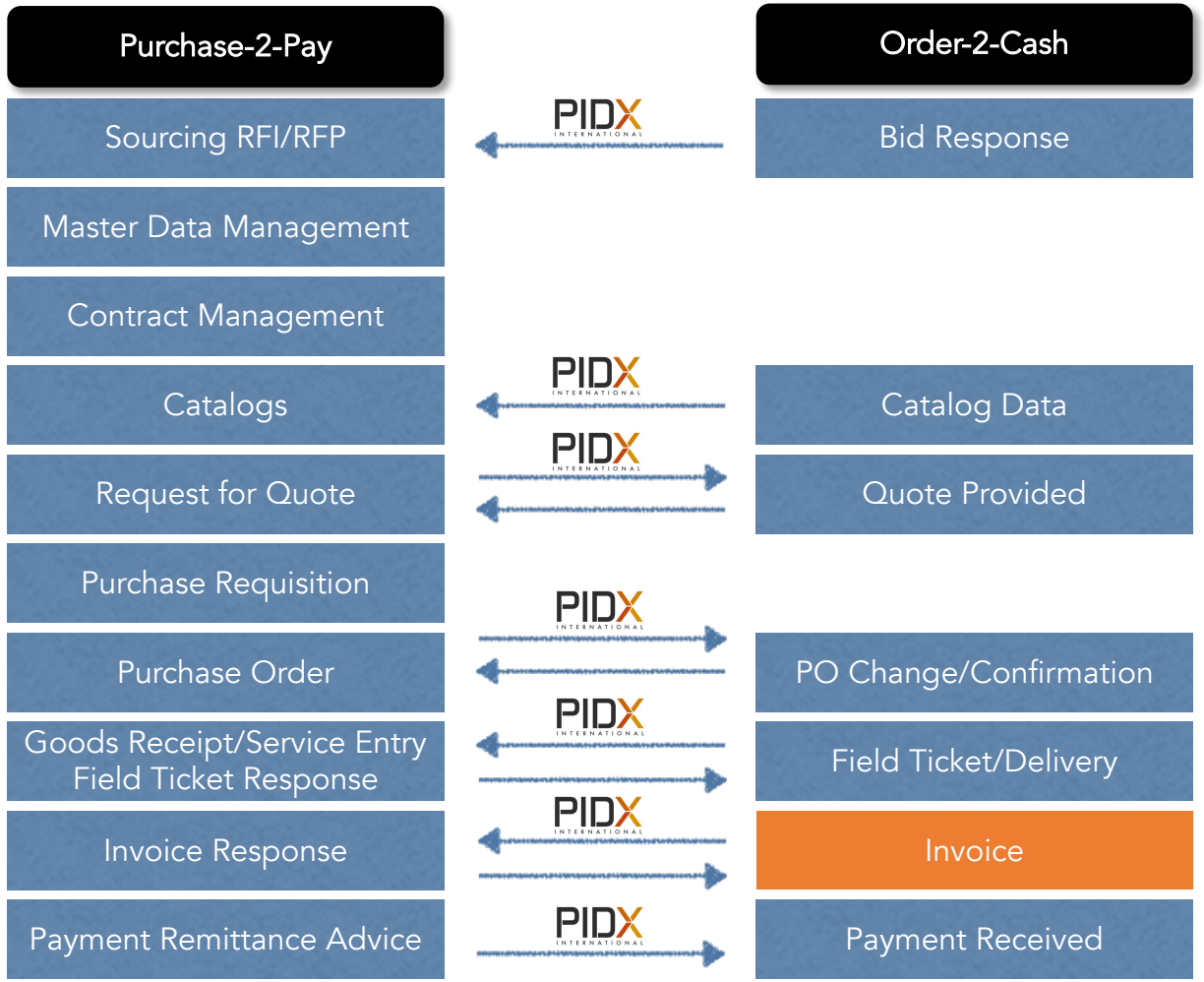
Requires the Supplier to perform life-cycle measurements such as the GHG Protocol “Cradle-to-Gate” measurement process and send these emissions on a per product or service basis to the Buyer.

Buyer aggregates the line-item emissions to create a complete picture of their Scope 3 Emissions.

ORCHESTRATION OF SUPPLY CHAIN MESSAGES

PIDX EMISSIONS TRANSPARENCY

Operator (Buyer)



Supplier

TWO APPROACHES

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PETROLEUM INDUSTRY DATA DICTIONARY

Segment	MINING AND WELL DRILLING MACHINERY AND ACCESSORIES	20
Family	OIL AND GAS DRILLING AND EXPLORATION EQUIPMENT	12
Class	COMPLETION TOOLS AND EQUIPMENT	14
Commodity	LINER HANGERS	17

UNSPSC Code 20 12 14 17

Noun	HANGER
Modifier	LINER

PIDX PIDD HANGER:LINER

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

PIDX PIDD Detailed Attributes

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

Workgroup to extend PIDX PIDD for GHG

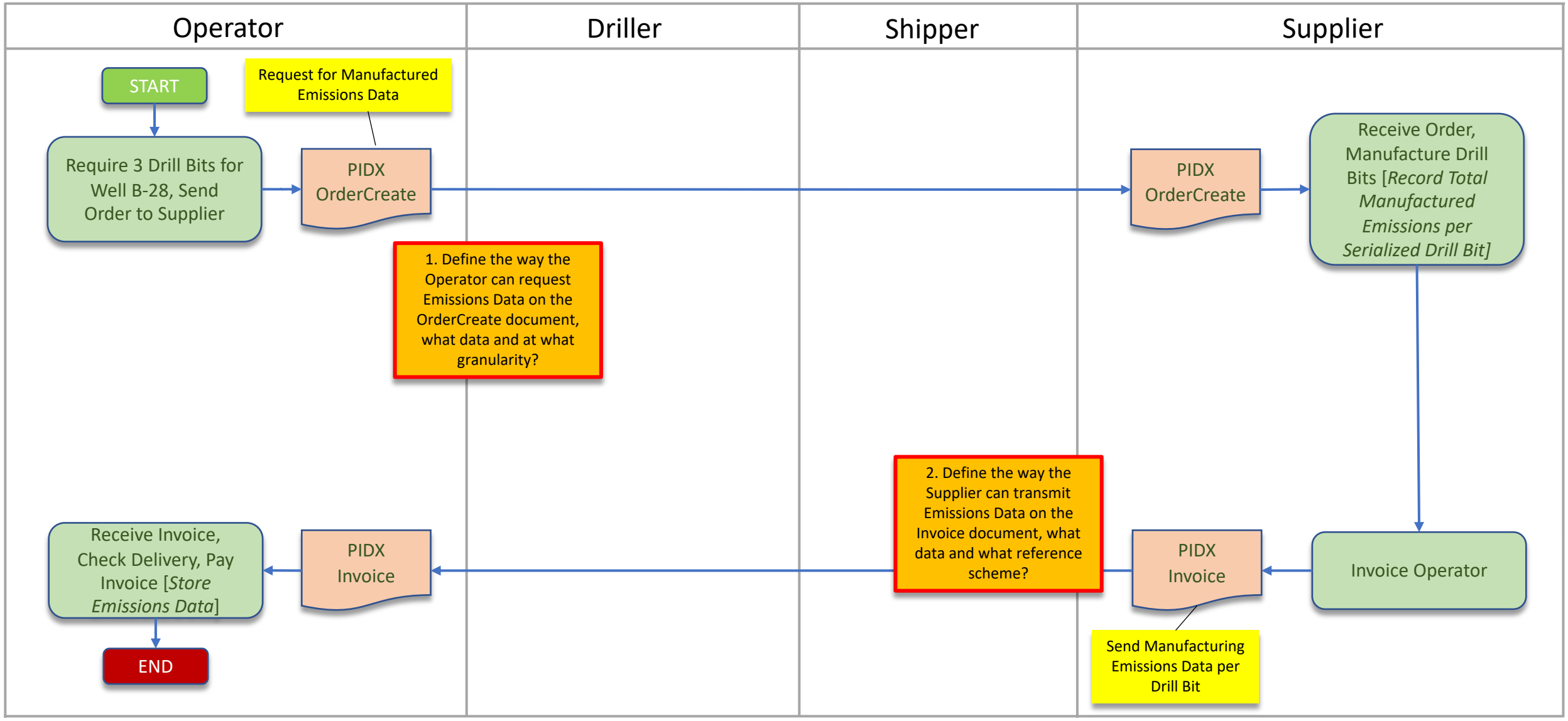
SUPPLY CHAIN SCHEMA ADDITIONS - SCOPE 3

PIDX EMISSIONS TRANSPARENCY

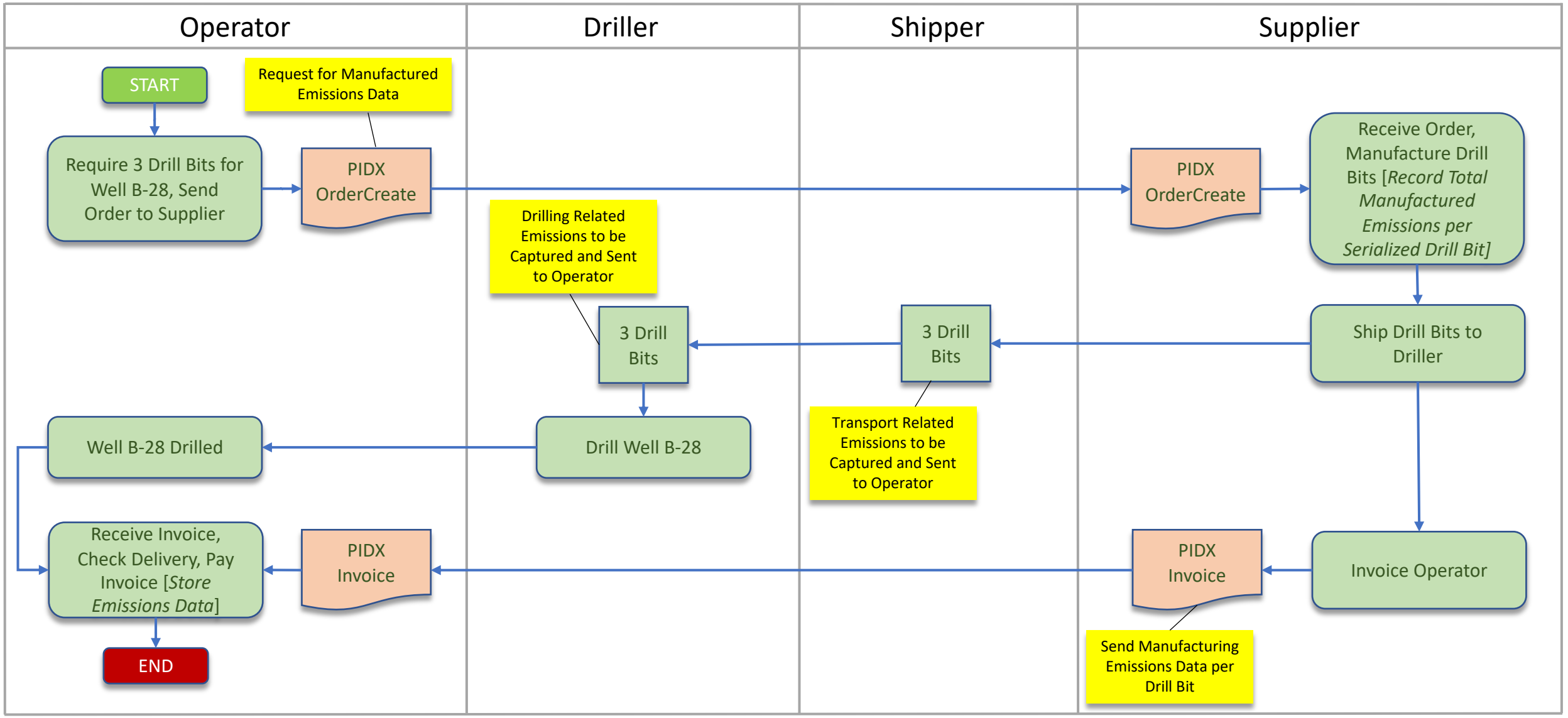
Emissions Data for Products and Services (Scope 3 Category 1)

#	Attribute	Unit	Notes / References
14	**Product GHG Emission (cradle-to-gate)**	kg CO_2e	Upon purchase of the product, this attribute is expected to become part of the purchasing company's upstream scope 3 emissions.
15	**Operational GHG Emission**	kg CO_2e / [time]	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.
16	**Service GHG Emission**	e.g., kg CO_2e / hour	This attribute expected for services. What are emissions for this service? Per day, per hour, per whatever unit the service is provided.
17	**Emission Uncertainly**	%	An estimate of how certain the company is of the value in Attribute #14 / #16
18	**Emission Methodology**	String	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., AR5[1].
19	**Emission Verification & Validity**	String	Entity that has verified and/or validated emissions, based on ISO 14064-3:2019
20	**Scope & Category**	Limited List	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.

PIDX DOCUMENT EXCHANGE



BUSINESS PROCESS DATAFLOW USE CASE 1.0



SAMPLE PIDX INVOICE DATA

PIDX™ EMISSIONS TRANSPARENCY

Invoice pidx:InvoiceDetails pidx:InvoiceLineItem pidx:EmissionsData

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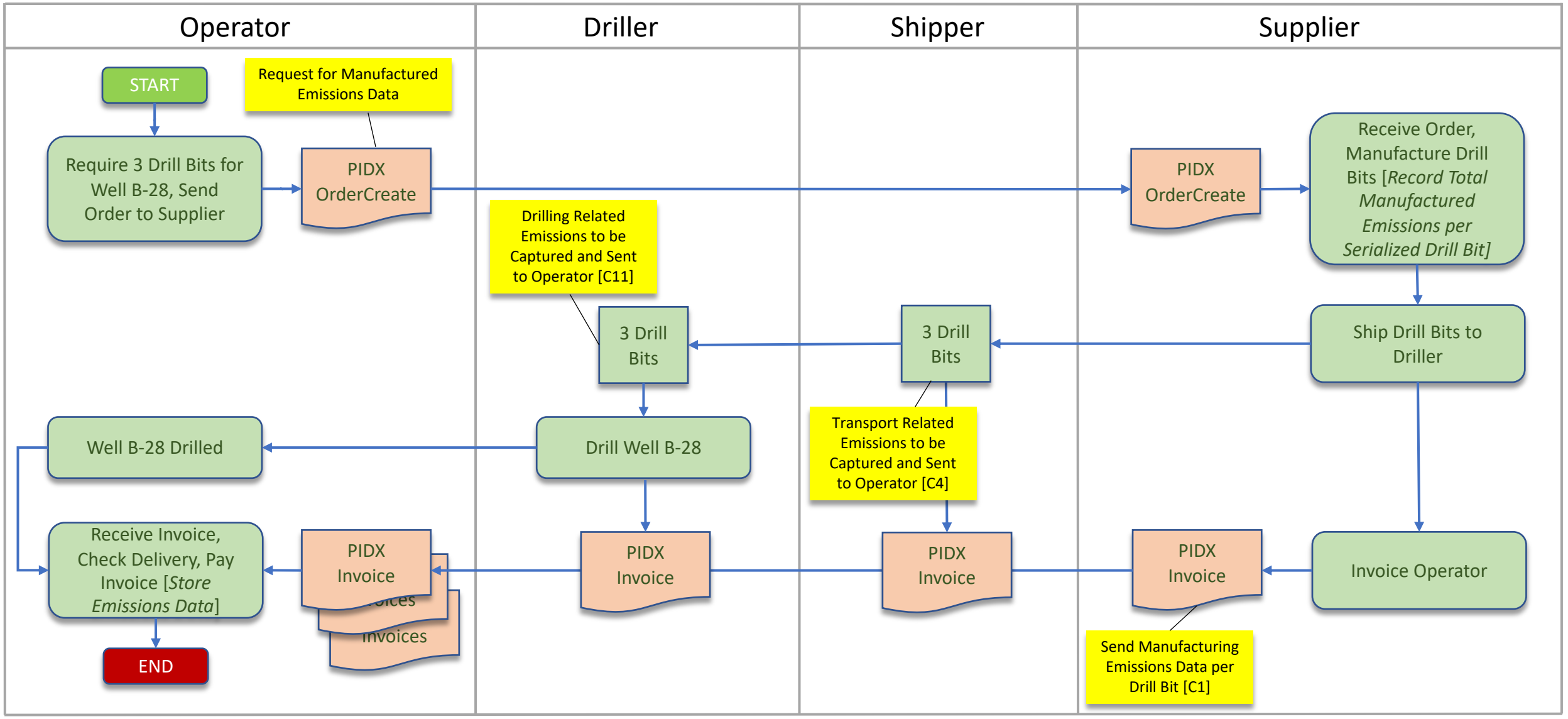
ART OF THE POSSIBLE



WHAT IS AVAILABLE TODAY – TOP DOWN

PIDX™ EMISSIONS TRANSPARENCY

Scope 3 GHG emissions [A] [B]

	Unit	2021	2020	2019	2018	2017	IPIECA	SASB	GRI
Purchased goods and services (Category 1)									
Third-party products [C]	million tonnes CO_2e	**147**	147	178	190	186	CCE-4	–	305-3
Fuel and energy-related activities (not included in Scope 1 or Scope 2) (Category 3)									
Third-party power [D]	million tonnes CO_2e	**136**	103	102	96	87	CCE-4	–	305-3
Downstream Transportation and Distribution (Category 9)									
Sold own energy products [E]	million tonnes CO_2e	**6**	–	–	–	–	–	–	305-3
Use of sold products (Category 11)									
Use of sold products [F]	million tonnes CO_2e	**1,010**	1,054	1,271	1,351	1,318	CCE-4	–	305-3
Own production [G]	million tonnes CO_2e	**380**	452	564	594	582	CCE-4	–	305-3
Third-party products [H]	million tonnes CO_2e	**630**	602	708	757	736	CCE-4	–	305-3

[A] 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 in oil products and pipeline 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 metric.
[B] Estimated emissions from other Scope 3 categories are published on www.shell.com/ghg. 2021 data will be available in June 2022.
[C] This category includes estimated well-to-tank emissions from purchased third-party refined oil products, natural gas, LNG, crude oil and biofuels.
[D] This category includes estimated well-to-wire emissions from generation of purchased power included in our net carbon intensity.
[E] Estimated emissions from transportation and distribution of sold own oil products, LNG, GTL, natural gas, and biofuels.
[F] This category includes estimated emissions from sales volumes of oil products, natural gas, LNG, GTL and biofuels.
[G] This category includes estimated emissions from our refinery production, natural gas, LNG and GTL products.
[H] Estimated as the difference between own production and total sold products.

https://reports.shell.com/sustainability-report/2021/our-performance-data/greenhouse-gas-and-energy-data.html

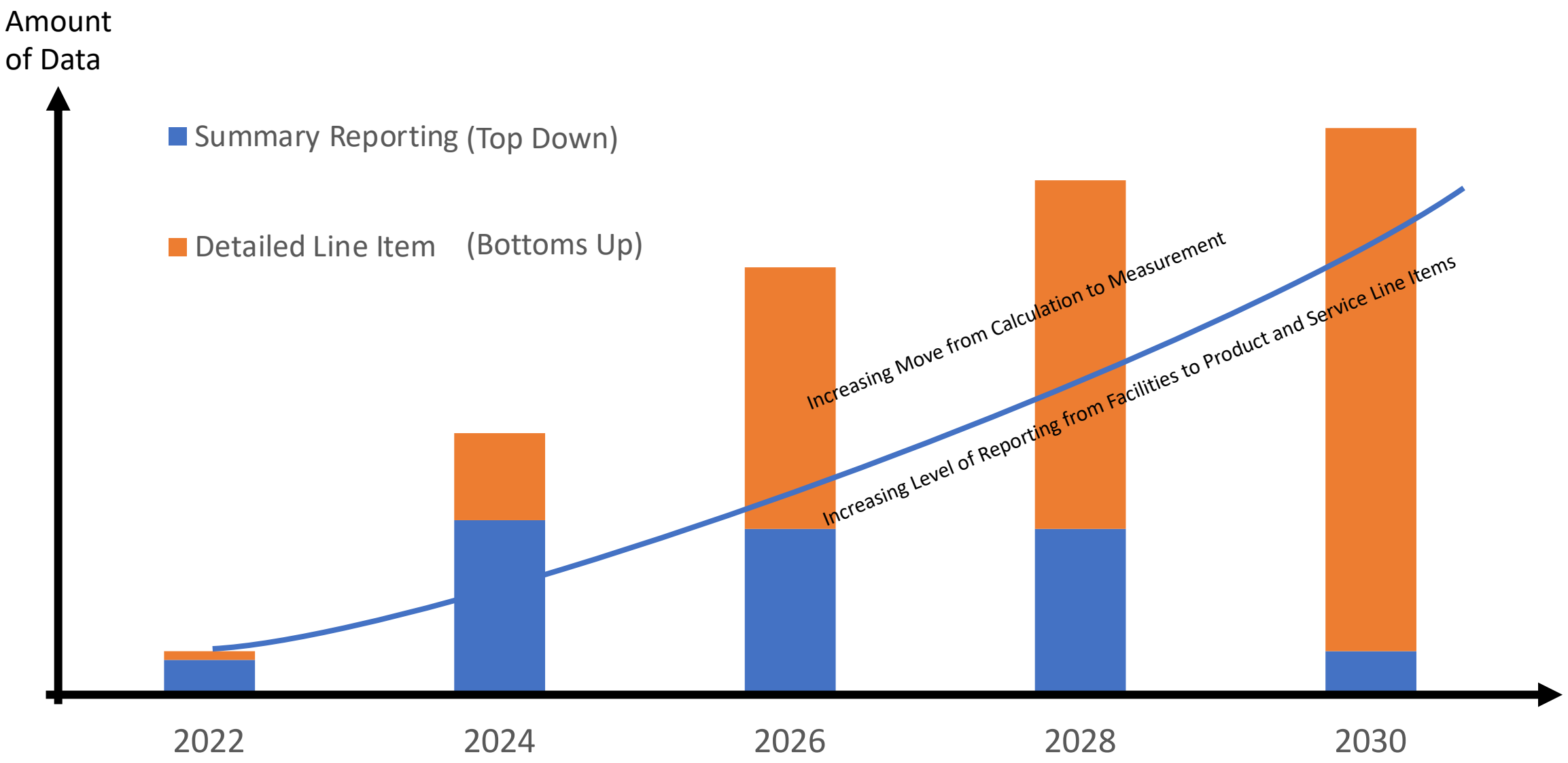
Companies Produce Sustainability Reports at a Macro Level using Industry Averages

2020 GHG Emissions Reported by Category (metric tonnes of CO_2e)

Scope	Emissions	Notes
Scope 1 (Direct) Emissions	1,973,000	Manufacturing process, onsite fuel combustion, refrigerants, onsite fleet/ air travel
Scope 2 (Indirect, Electricity)	909,000	Market-based method;[1] includes renewable energy purchases.
Scope 1 and 2 Total	**2,882,000**	
Scope 3 Total	**29,866,000**	Indirect/value chain.
Leased Vehicles and Commuting	296,000	Employee leased vehicles and commuting.
Logistics and Distribution	189,000	Upstream and downstream transport and distribution.
Employee Business Travel	24,000	Air travel, car rentals, and hotel stays.
Supply Chain	4,484,000	Represents the 2020 estimate based on key suppliers' 2020 CDP Climate Change Questionnaire information.
Capital Goods	93,000	Extraction, production, and transport of capital goods purchased.
Fuel and Energy Related Activities	95,000	Impacts related to extraction, production, and transportation of fuels and energy purchased, not already included in Scope 1 or 2. Market-based method.[2]
Waste Generated in Operations	7,000	Disposal and treatment of waste generated in our operations.
Product Energy Usage	24,407,000	Represents the GHG emissions of the product lifetime (5,596,000 metric tonnes of CO_2e annualized).
Processing of Sold Products	271,000	Processing of intermediate products sold to down-stream manufacturers.

[1] Location-based method Scope 2 emissions (does not account for any renewable energy purchases) = 3,700,000 metric tonnes CO_2e/year.
[2] Market-based method includes renewable purchases. Location-based method emissions (does not account for any renewable energy purchases) = 253,000 metric tonnes of CO_2e/year.

DATA RAMP UP AND CONVERSION



Challenges with calculation and reporting of emissions

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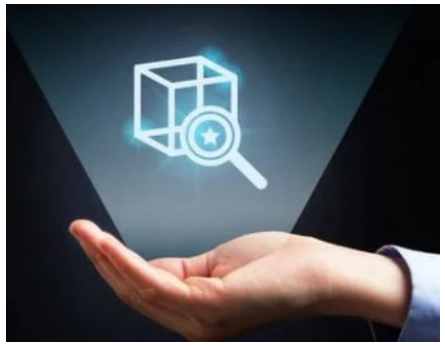
EMISSIONS TRANSPARENCY

Stakeholder and reporting pressures



Lack of standards

Or abundance

Slow, manual processes

Value Chain

Scope 3 emissions

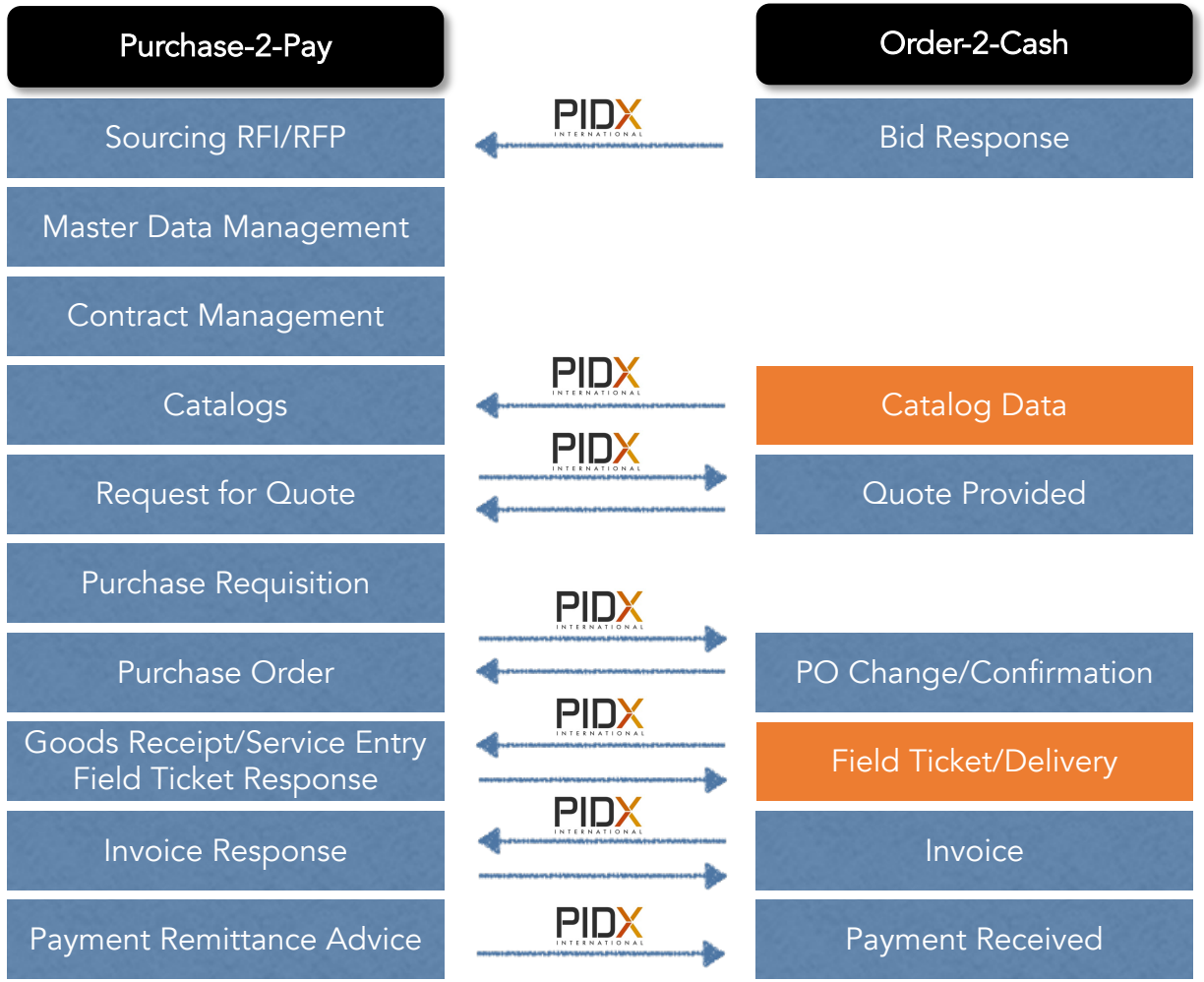
"Today, carbon accounting suffers from data quality issues, measurement and reporting inconsistencies, siloed platforms, and infrastructure challenges. This makes it difficult to compare, combine and share reliable data, particularly for companies."

The Carbon Call – Feb 10, 2022

ORCHESTRATION OF SUPPLY CHAIN MESSAGES

PIDX EMISSIONS TRANSPARENCY

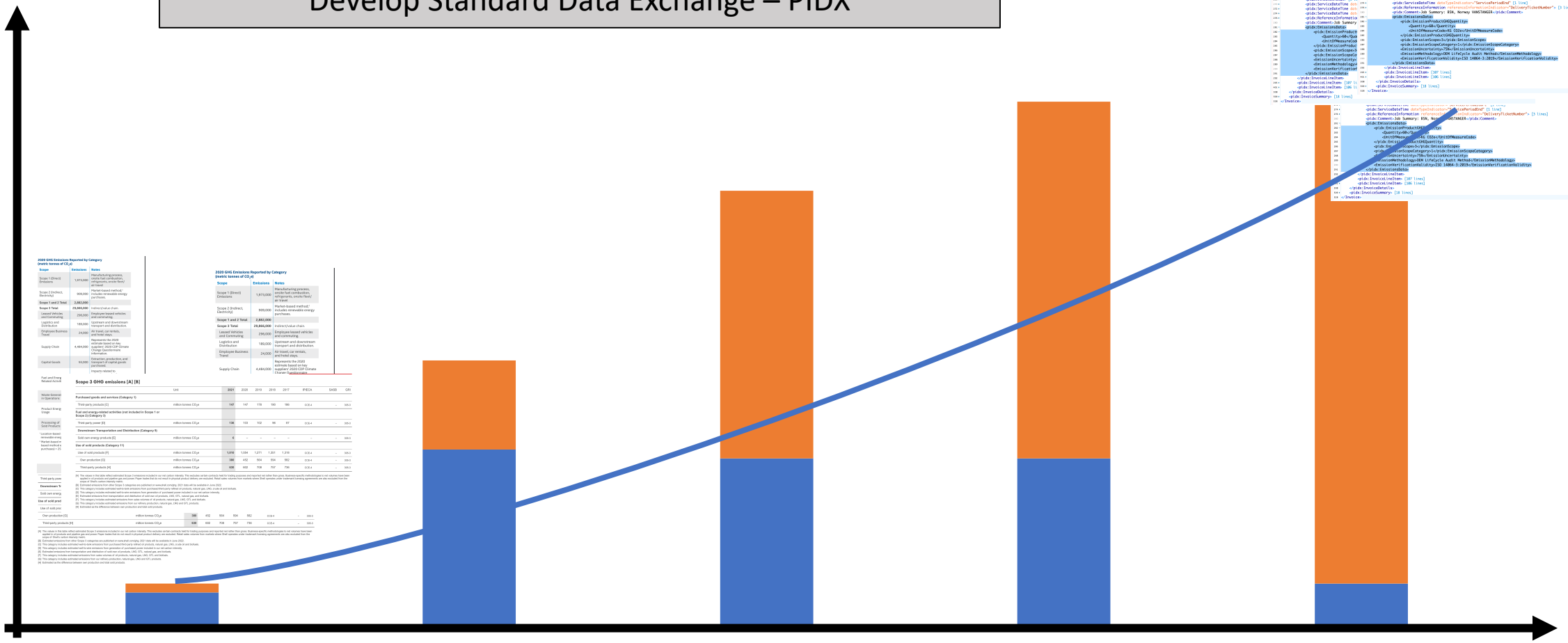
Operator (Buyer)



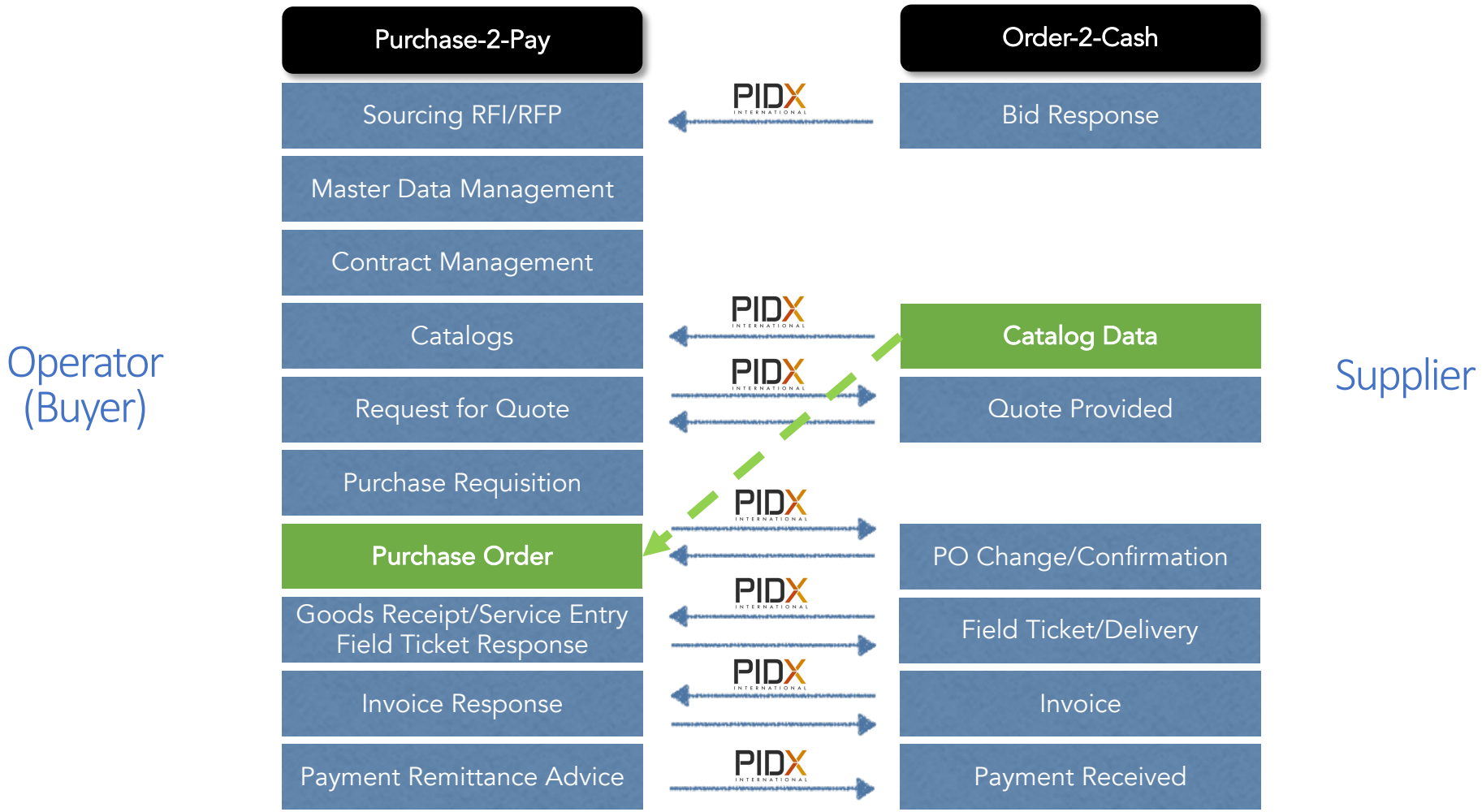
Supplier

THERE IS A CLEAR PATH - STANDARDS

Define Standard Reporting Data – OpenFootprint
Develop Standard Data Exchange – PIDX



POC BETWEEN OPERATOR AND BUYER



POC BETWEEN OPERATOR AND SERVICE CO.

PIDX™ EMISSIONS TRANSPARENCY

Column C	UoM	Attribute #					Notes
		14	17	18	19	20	
		KG CO2e per KG of product	+/- %	Emission Methodology	Emission Verification & Validity	Scope & Category	
BARITE 4,1	not provided	0.180	84%	IPCC 2007 (AR4)	None	Scope 3 Category 1	
BENTONITE EXTENDER	not provided	0.279	89%	IPCC 2007 (AR4)	None	Scope 3 Category 1	
CALCIUM CARBONATE D151-10	not provided		N/A	GWP: IPCC 2013	According to ISO 14025:2006. PCR: Micronized stone from quarry-UN CPC 15200, 15320	Scope 3 Category 1	Proxy used: micronized limestone with selected granulometry lower than 200 µm.(CA150, CA40, CA150SMP)
LIME	20 KG & 400KG		N/A	EN15804:2012+A1:2013	According to ISO 14025. PCR 2012:01 Construction Products and Construction Services, Version 2.33, 2020-09-18. PCR 2012:01-Sub-PCR-H, Product category rules Cement and Building Lime, version 2.31, 2020-09-18	Scope 3 Category 1	
CLASS C CEMENT	not provided		N/A	GWP100, EN 15804. Version: August 2021	as per ISO 14025 and EN 15804+A2	Scope 3 Category 1	Proxy used: Class C acc. to API Spec 10A
CEMENT, CLASS A	not provided		N/A	U.S EPA TRACI v2.1 IPCC 2013 (AR 5)	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)	Scope 3 Category 1	Proxy used: Portland Type I/II ASTM C150

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 packagin 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 BETWEEN OPERATOR AND SERVICE CO.

POC Successful ☑

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

POC BETWEEN OPERATOR AND SERVICE CO.

PIDX EMISSIONS TRANSPARENCY

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

POC BETWEEN OPERATOR AND SERVICE CO.

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.

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Please get involved!

Questions or Comments?

Lessons Learned from Scope 3 Reporting POC

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Chris Welsh – Chair ETDX Project Team, PIDX COO

James Thompson – ConocoPhillips Sr. IT Process Consultant, ETDX Member