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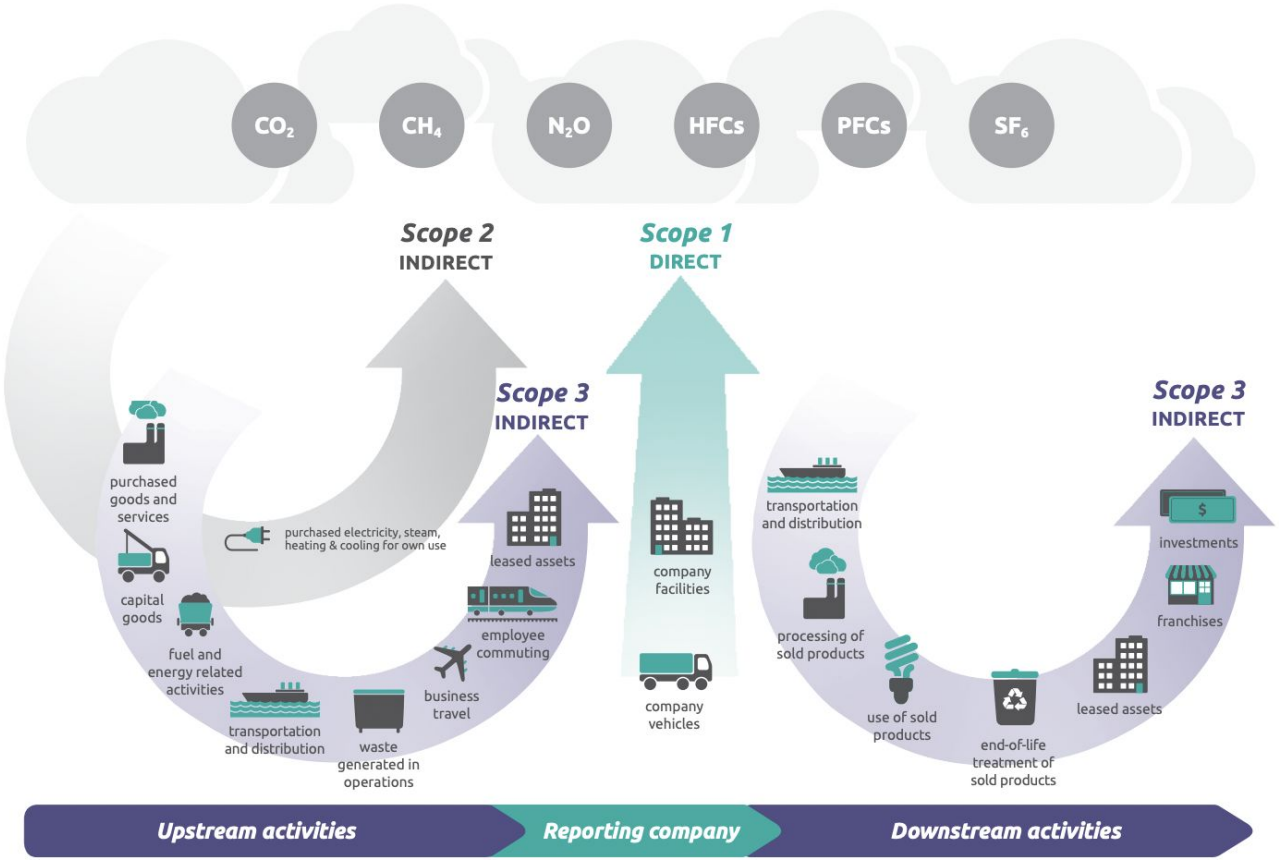
Bottom-up Scope 3 Emissions Tracking and Reporting through PIDX Business Messages

Scope 3 Emissions

Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but that is how the organization indirectly impacts its value chain



Source: [WRI/WBCSD Corporate Value Chain (Scope 3) Accounting and Reporting Standard](#) (pdf)

Scope 3 emissions fall within 15 categories

	Scope 3 Category	Description
1	Purchased goods and services	Extraction, production, and transportation of goods and services purchased or acquired by the reporting company in the reporting year, not otherwise included in Categories 2 - 8.
2	Capital goods	Extraction, production, and transportation of capital goods purchased or acquired by the reporting company in the reporting year.
3	Fuel-and-energy related activities (not included in scope 1 or 2)	Extraction, production, and transportation of fuels and energy purchased or acquired by the reporting company in the reporting year, not already accounted for in Scope 1 or Scope 2.
4	Upstream transportation and distribution	Transportation and distribution services purchased by the reporting company in the reporting year, including inbound logistics, outbound logistics (e.g., of sold products), and transportation and distribution between a company's own facilities (in vehicles and facilities not owned or controlled by the reporting company).
5	Waste generated in operations	Disposal and treatment of waste generated in the reporting company's operations in the reporting year (in facilities not owned or controlled by the reporting company).
6	Business travel	Transportation of employees for business-related activities during the reporting year (in vehicles not owned or operated by the reporting company).
7	Employee commuting	Transportation of employees between their homes and their worksites during the reporting year (in vehicles not owned or operated by the reporting company).
8	Upstream leased assets	Operation of assets leased by the reporting company (lessee) in the reporting year and not included in Scope 1 and Scope 2 – reported by lessee.
9	Downstream transportation and distribution	Transportation and distribution of products sold by the reporting company in the reporting year between the reporting company's operations and the end consumer (if not paid for by the reporting company), including retail and storage (in vehicles and facilities not owned or controlled by the reporting company).
10	Processing of sold products	Processing of intermediate products sold in the reporting year by downstream companies (e.g., manufacturers).
11	Use of sold products	End use of goods and services sold by the reporting company in the reporting year.
12	End of life treatment of sold products	Waste disposal and treatment of products sold by the reporting company (in the reporting year) at the end of their life.
13	Downstream leased assets	Operation of assets owned by the reporting company (lessor) and leased to other entities in the reporting year, not included in Scope 1 or Scope 2 reported by lessor.
14	Franchises	Operation of franchises in the reporting year, not included in Scope 1 and Scope 2 – reported by franchisor.
15	Investments	Operation of investments (including equity and debt investments and project finance) in the reporting year.

Source: https://www.sustainablefinance.hsbc.com/-/media/gbm/sustainable/attachments/guide-to-net-zero.pdf

Two Approaches to Emission Data Collection and Reporting

1 TOP-DOWN

Top-Down Emission Reporting refers to an approach that considers an organization's overall emissions rather than individual sources.

It is particularly useful for organizations that lack precise control over their emissions sources and face challenges in accurately measuring them.

The top-down approach provides a broader perspective on emissions but may rely more on estimations due to the complexity of aggregating data from various sources.

2 BOTTOM-UP

In the Bottom-Up Approach, also known as the Line-Item Approach, emissions data is collected at the source level.

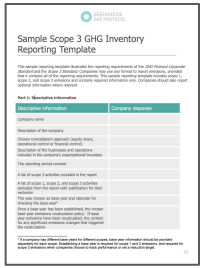
This method entails measuring or estimating emissions from each specific emitter, which could be associated with a particular product or service and aggregating these data to create a comprehensive emissions inventory.

This method provides detailed and accurate data.

The Complete Emission Data Collection and Reporting Cycle

Top-Down Approach

Consolidated Greenhouse-gas emissions report



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Consolidation of all Emissions Data

Bottom-Up Approach

ERP

PIDX Invoice (With Emissions Data)

SUPPLIER

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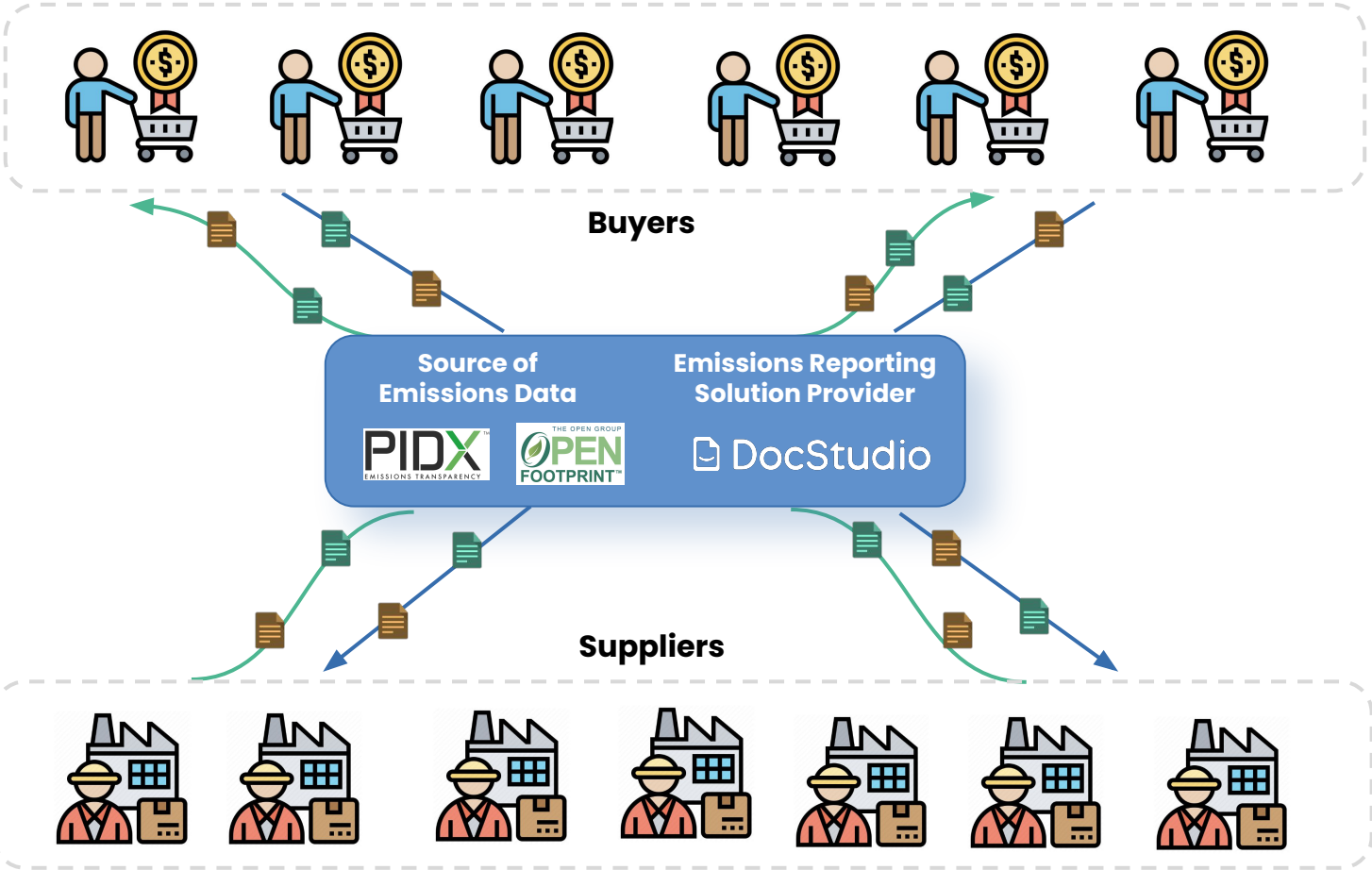
PIDX Invoice with Emission Data

BUYER

Exchange of Emission Data Between Emission Data Senders and Receivers

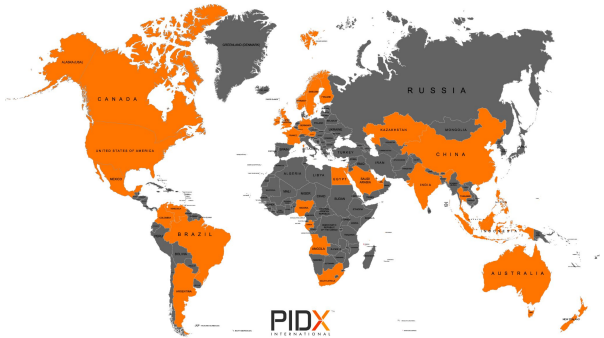


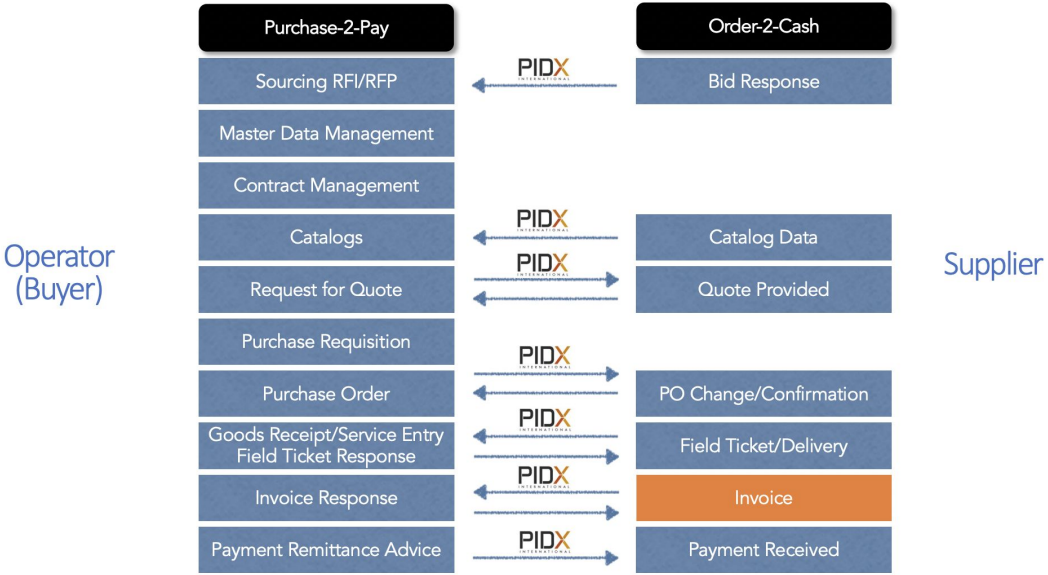
PIDX Standard: Supply Chain Messages for Bottom-Up Approach of Emission Collection and Reporting

PIDX International standardizes business processes that deal with data exchange between trading partners in the Oil & Gas business.

List of standards encompasses XML schemas, Best Practices Documents, Business Process Guidelines, Implementation Guides, Industry Code Lists, the Data Dictionary and the Petroleum Industry Glossary.

WORLDWIDE USE OF PIDX STANDARDS





Source: https://pidx.org/standards/

PIDX V1.7: Invoice with Emission Data

PIDXSampleInvoice.xml*

Invoice pidx:InvoiceDetails pidx:InvoiceLineItem pidx:EmissionsData

```
<?xml version="1.0" encoding="UTF-8"?>
<Invoice xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
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    xmlns="http://www.pidx.org/schemas/v1.7" xmlns:pidx="http://www.pidx.org/schemas/v1.7"
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    <pidx:InvoiceSummary> [18 lines]
</Invoice>
```

STANDARDS- Solution to the Transparent Emission Data Collection and Reporting

PIDX ETDX (Emissions Transparency Data Exchange) is developing the energy transition standards for data exchange regarding carbon emissions and other energy transition-type needs that are designed to be harmonized across industry participants.

Benefits:

- clarity on energy standards by region and regulatory bodies
- transparency of reporting, and alignment between operators,
  suppliers, and network providers

The initiative addresses the data needed to meet requirements, technical integrations (i.e. APIs.) for reuse and sustainability, and potential savings in resources.

Benefits of PIDX ETDX For IT Solution Providers, Emission Data Senders, and Receivers

For IT Solution Providers

- **Efficient Development:** PIDX ETDX standards provide a straightforward approach and consistent format, simplifying emissions reporting.
- **Seamless Collaboration:** Embracing PIDX ETDX standards ensures smooth interaction across diverse systems and partners.
- **Quicker Implementation:** Standardization accelerates time-to-market by offering a streamlined and clear implementation process.

For Emission Data Senders, and Receivers

- **Efficient Data Exchange:** PIDX ETDX standards enable smooth emission data sharing, minimizing errors and delays.
- **Consistent Data Structure:** Employing PIDX ETDX guarantees a uniform data format, eliminating compatibility problems across systems.
- **Easier Compliance:** Enhanced data exchange simplifies accurate reporting and regulatory adherence

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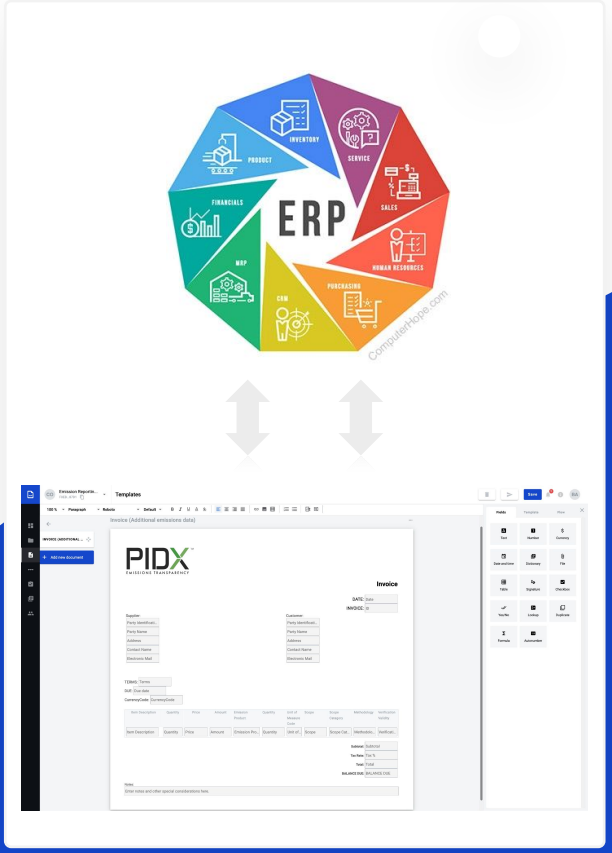
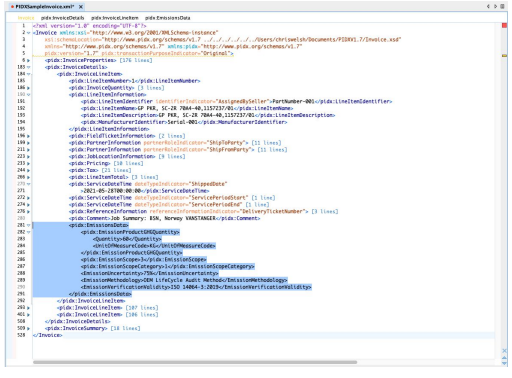
All-In-One e-Document Platform for a Sustainable Future

- **Adaptable Formats and Templates:** Design templates for diverse formats (XML, JSON, CSV, TXT, PDF).
- **Standard Compatibility:** Handle PIDX, X12, IDOC, EDIFACT, and more.
- **Varied Protocols:** Connect through SFTP, AS2, AS4, API, and others.
- **Robust Security:** Employ SSL, MPLS, VPN to fortify your data.
- **Document Types Diversity:** Manage Orders, Invoices, Agreements, and more effortlessly.
- **Effortless Integration:** Seamlessly merge with internal and external systems.
- **Integration Made Easy:** Effortlessly map, convert, and integrate.
- **Enhanced Capabilities:** Leverage e-signatures, secure archiving, blockchain storage.
- **Inclusive Collaboration:** Partner with high-tech, low-tech, and no-tech parties.
- **Empowering ESG:** Propel your Environmental, Social, and Governance strategies forward with Emission Reporting Capabilities.



How Emissions Reporting looks like with DocStudio?

SUPPLIER



PIDX Invoice
(With/without Emissions Data)

Source of Emissions Data

PIDX EMISSIONS TRANSPARENCY

THE OPEN GROUP OPEN FOOTPRINT™

PIDX Invoice

DocStudio

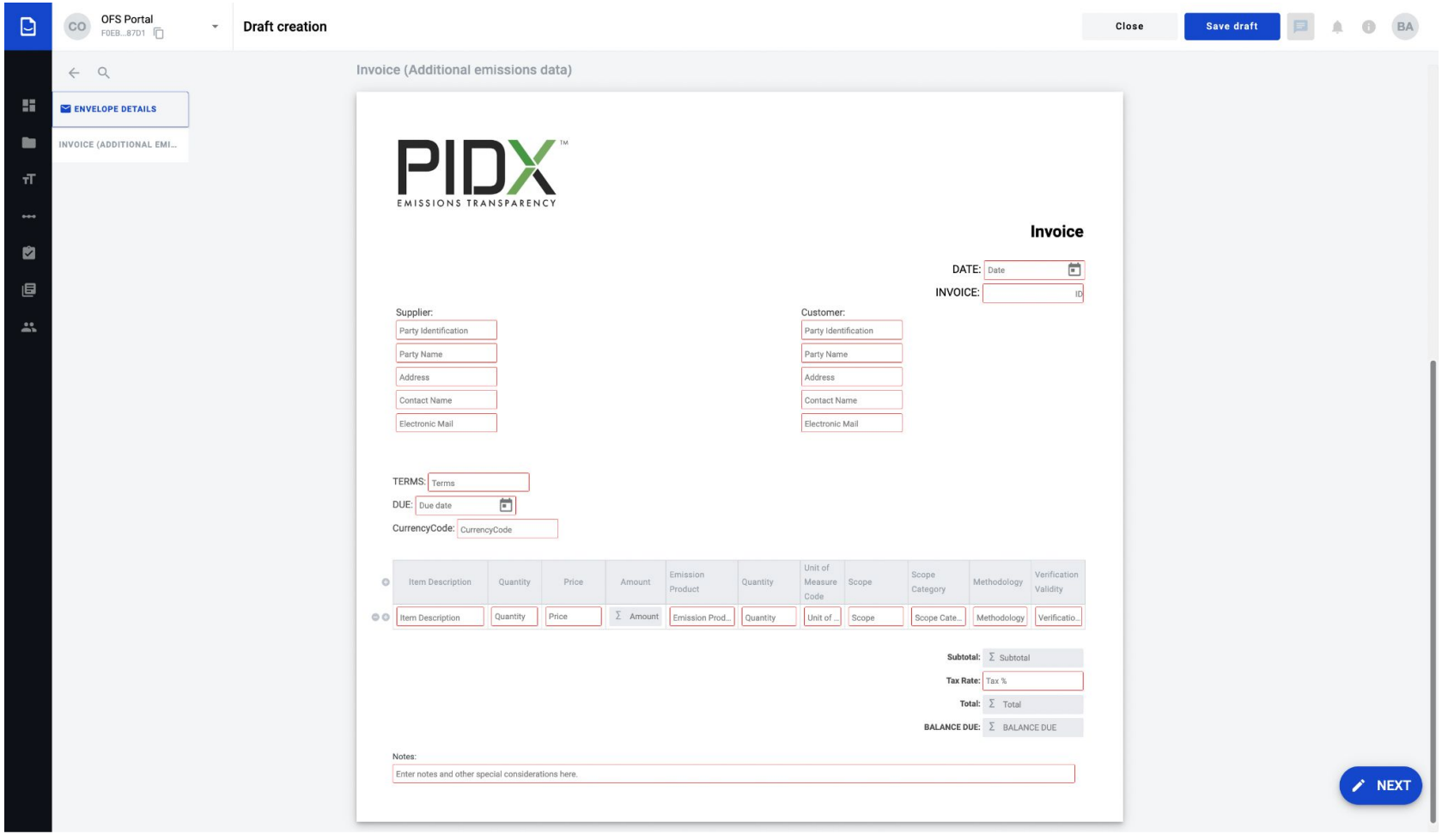
PIDX Invoice with Emission Data (XML+PDF)

- Process and analyze invoice data
- Aggregate data
- Translate/map the data
- Enreach items and services with Emissions Data if needed
- Verify the Emission Data Source

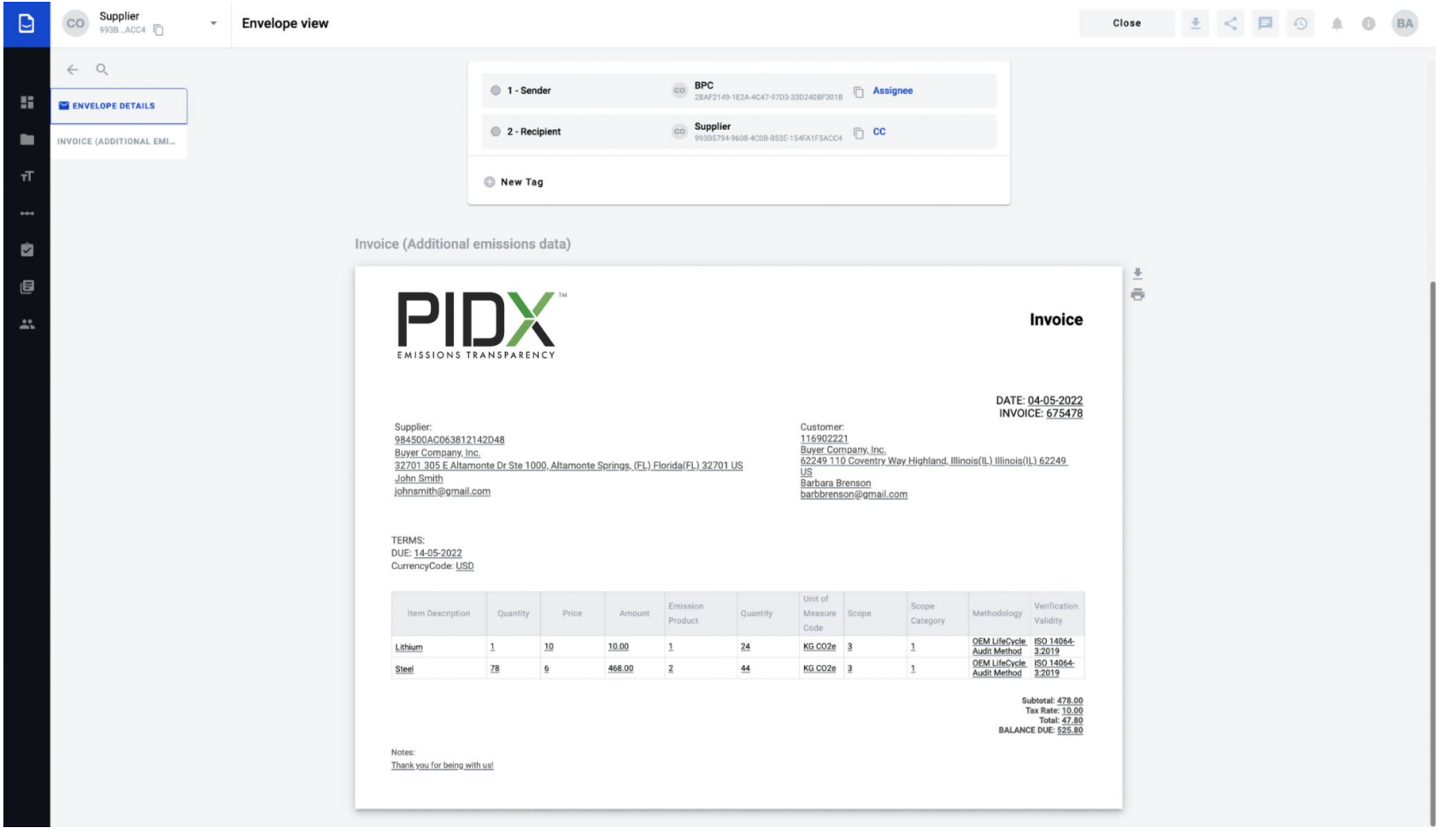
BUYER

PIDX Invoice with Emission Data (XML+PDF)

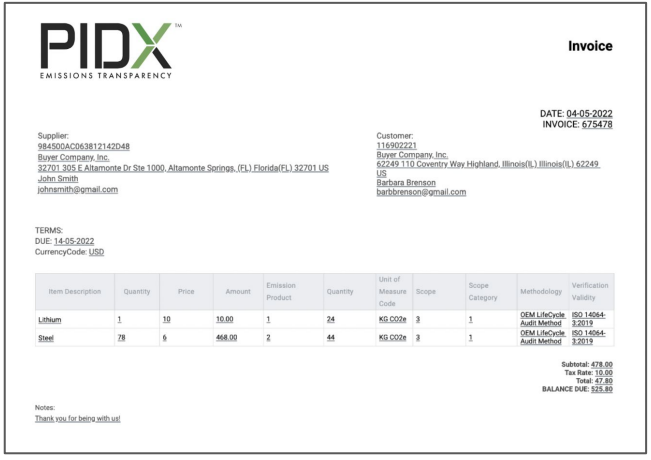
Template: PIDX Invoice with Emissions Data



PIDX Invoice with Emissions Data



Completed document



PIDX
EMISSIONS TRANSPARENCY

Invoice

DATE: 04-05-2022
INVOICE: 675478

Supplier:
984500AC063812142D48
Buyer Company, Inc.
32701 305 E Altamonte Dr Ste 1000, Altamonte Springs, (FL) Florida(FL) 32701 US
John Smith
johnsmith@gmail.com

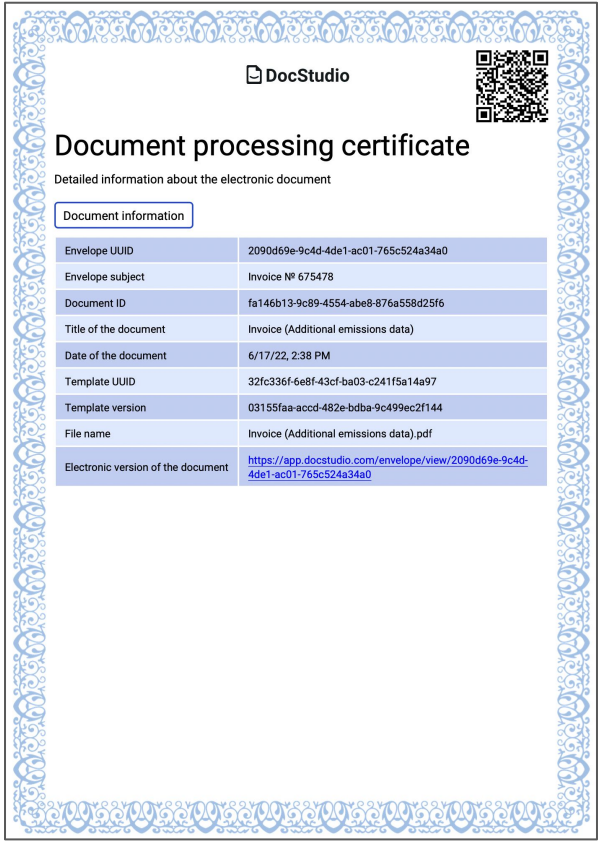
Customer:
116902221
Buyer Company, Inc.
62249 110 Coventry Way Highland, Illinois(IL) Illinois(IL) 62249 US
Barbara Brenson
barbbrenson@gmail.com

TERMS:
DUE: 14-05-2022
CurrencyCode: USD

Item Description	Quantity	Price	Amount	Emission Product	Quantity	Unit of Measure Code	Scope	Scope Category	Methodology	Verification Validity
Lithium	1	10	10.00	1	24	KG CO2e	3	1	OEM LifeCycle Audit Method	ISO 14064-3:2019
Steel	78	6	468.00	2	44	KG CO2e	3	1	OEM LifeCycle Audit Method	ISO 14064-3:2019

Subtotal: 478.00
Tax Rate: 10.00
Total: 47.80
BALANCE DUE: 525.80

Notes:
Thank you for being with us!



DocStudio

Document processing certificate

Detailed information about the electronic document

Document information

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Envelope subject	Invoice № 675478
Document ID	fa146b13-9c89-4554-abe8-876a558d25f6
Title of the document	Invoice (Additional emissions data)
Date of the document	6/17/22, 2:38 PM
Template UUID	32fc336f-6e8f-43cf-ba03-c241f5a14a97
Template version	03155faa-accd-482e-bdba-9c499ec2f144
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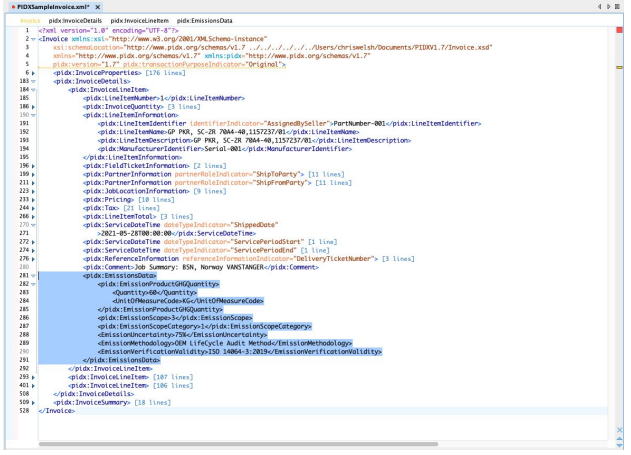

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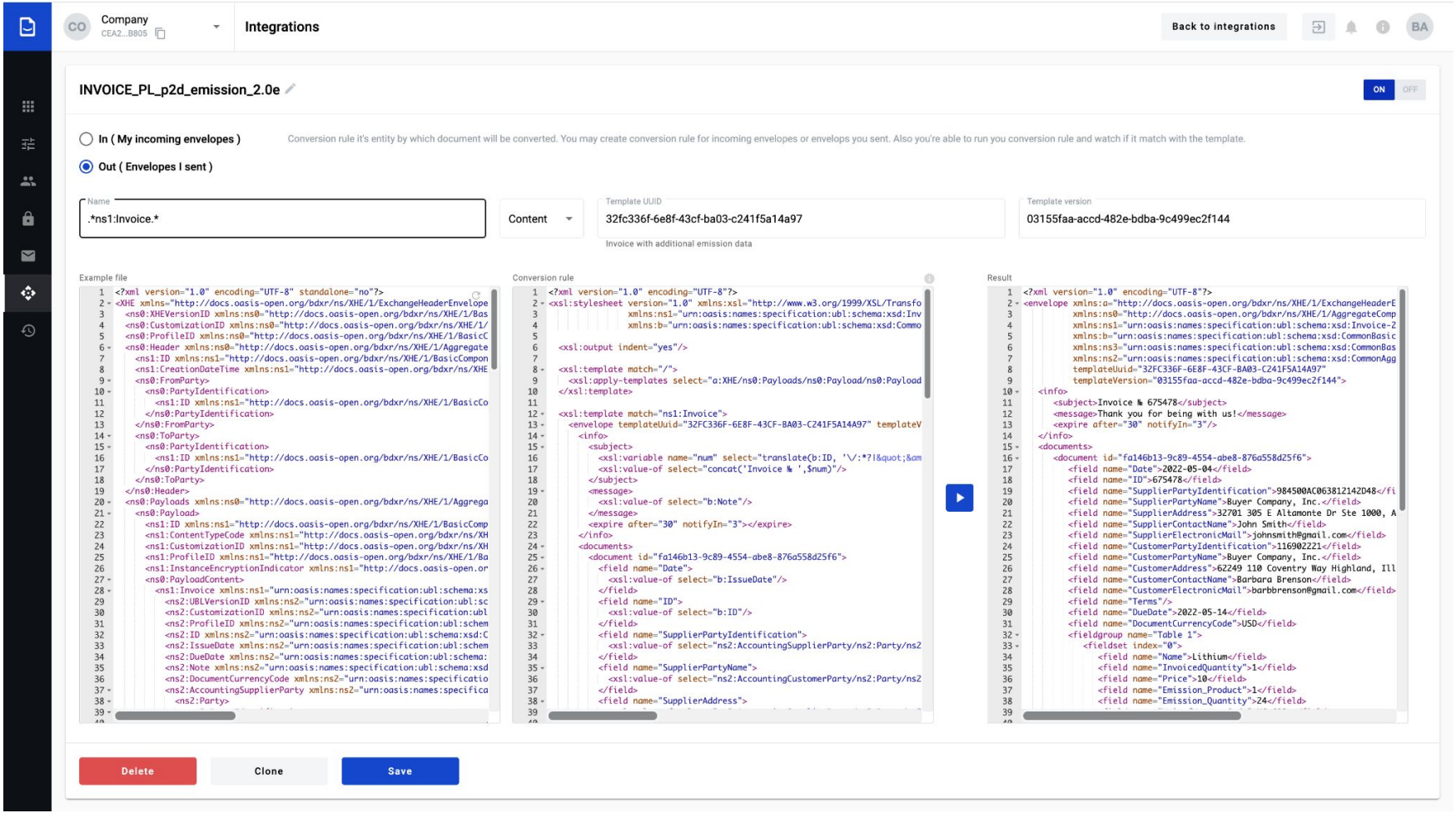
Integrations and mapping engine



Emissions Delta Report Generation

Emissions Delta Report Generation refers to the process of creating reports that highlight the changes or differences (deltas) in emissions data over a specific period. These reports are crucial for organizations aiming to monitor and manage their environmental impact, particularly in terms of greenhouse gas emissions.

Emissions Delta Report Generation is a key component of sustainable business practices, enabling organizations to quantitatively measure changes in their emissions and evaluate the success of their efforts to minimize their carbon footprint.

- Process and analyze invoice data
- Aggregate data
- Enreach items and services with Emissions Data
- Verify the Emission Data Source
- Generate Scope 3 Annual Report

Annual Greenhouse-gas emissions report by businesses / ISO 14064

Greenhouse-gas emissions reporting by businesses

Greenhouse-gas emissions reporting by businesses

Self-assessment template (ISO 14064)

General company information

Company name	Shell
Name of the action assessed	Net Carbon Footprint (NCF)
Person(s)/organisation(s) that did the assessment	Charles Core
Date of the Inventory assessment	8/26/2022
Whether the assessment is an update of a previous assessment, and if so, links to any previous assessments	6/15/22
Objective(s) of the assessment	No
Intended audience(s) of the assessment	Net Carbon Footprint
Opportunities for stakeholders to participate in the assessment	Share of energy delivered per product type (C)
Does the assessment apply to an individual action or a package of related actions, and if the latter, which policies and actions are included in the package	No

Organizational Boundaries

Equity Share	Financial Control	Operational Control
Yes	Yes	No

Scope

Yes **Scope 1 (emissions from sources owned or controlled by the company)** No **Scope 2 (emissions associated with the use (by the company) of grid-supplied electricity, heat, steam and/or cooling.)** **No Scope 3 (emissions associated with the company's value chain)**	**Reason: No reason provided**

Greenhouse gases considere

Emission types	Emission volumes (mtCO2e)	CO2	CH4	N2O	HFCs	PFCs	SF6
Scope 1	64	61	1.7	1	30	0	0
Scope 2	11	0.159	0	0	15	0	0
Scope 3	147	1.054	9	0	0	0	0

Timing

Yes ex-ante
No ex-post
No combination of ex-ante and ex-post

State the assessment period:
1 year (2021)

Base year

Year chosen as base year: 2017

Base year emission

Emission types	Emission volumes (mtCO2e)	CO2	CH4	N2O	HFCs	PFCs	SF6
Scope 1	50	58	1.2	1	22	0	0
Scope 2	10	0.159	0	0	13	0	0
Scope 3	137	1.001	0.1	0	0	0	0

Opportunities for stakeholders to participate in the assessment	Share of energy delivered per product type (C)
Does the assessment apply to an individual action or a package of related actions, and if the latter, which policies and actions are included in the package	No

Organizational Boundaries

Equity Share	Financial Control	Operational Control
Yes	Yes	No

Scope

Yes **Scope 1 (emissions from sources owned or controlled by the company)** Yes **Scope 2 (emissions associated with the use (by the company) of grid-supplied electricity, heat, steam and/or cooling.)** **Yes Scope 3 (emissions associated with the company's value chain)**	**Reason: No reason provided**

Greenhouse gases considere

Emission types	Emission volumes (mtCO2)
Scope 1	105
Scope 2	14
Scope 3	2258

Timing

Yes ex-ante
No ex-post
No combination of ex-ante and ex-post

State the assessment period:
2021

Base year

Year chosen as base year: 2017

Base year emission

Emission types	Emission volumes (mtCO2)
Scope 1	132
Scope 2	18
Scope 3	2844

Methodologies

Specify the methodologies that your company uses to calculate or measure emissions
OEM Life Cycle Audit Method

Inventory of emissions

Emissions disaggregated by source types

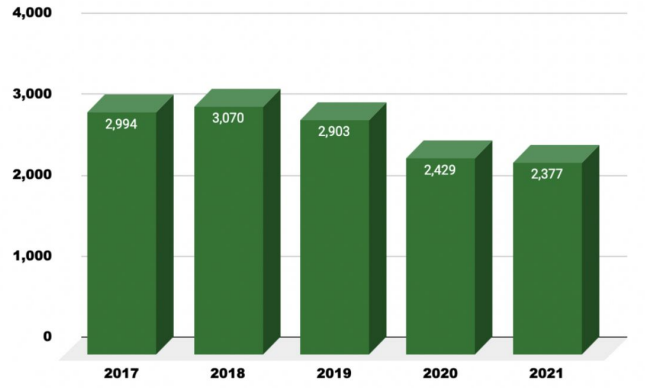
Scope 1: Direct Emissions from Owned/Controlled Operations	GHG emissions (operational control)
a. Direct Emissions from Stationary Combustion	The values in this table reflect estimated Scope 3 emissions included in our Net Carbon Footprint. Emissions from retail sales volumes from markets where Shell operates under trademark licensing agreements are excluded.
b. Direct Emissions from Mobile Combustion	Estimated emissions from other Scope 3 categories are published on www.shell.com/ghg. 2020 data will be available in June 2021.
c. Direct Emissions from Process Sources	This category includes estimated well-to-tank emissions from purchased third-party refined oil products, natural gas, LNG, crude oil and biofuels.
d. Direct Emissions from Fugitive Sources	This category includes estimated emissions from sales volumes of oil products, natural gas, LNG, GTL and biofuels.

Delta Report 2017- 2021

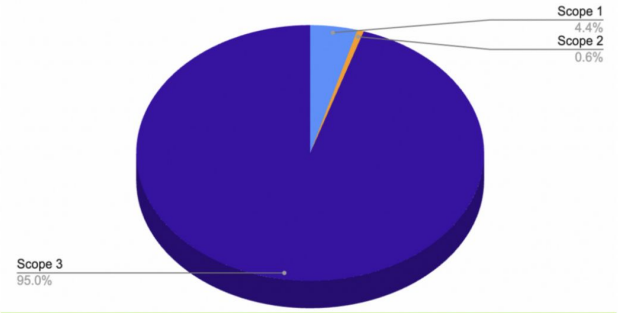
Greenhouse gases considere

Emission types	Emission volumes (mtCO2)				
	2017	2018	2019	2020	2021
Scope 1	132	135	128	107	105
Scope 2	18	19	17	15	14
Scope 3	2844	2916	2758	2308	2258

Annual GHG Emissions (2017 – 2021, Million Tonnes CO2 Equivalent)



GHG Emissions by Scope (2017-2021, Million Tonnes CO2 Equivalent)



Delta Report 2021 (Q1, Q2, Q3, Q4)

Yes combination of ex-ante and ex-post

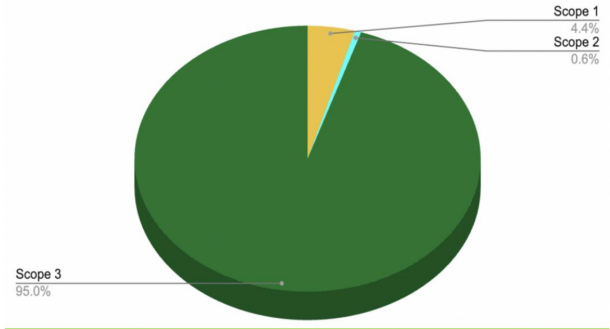
State the assessment period:
2021

Greenhouse gases considere

Emission types	Emission volumes (mtCO2)			
	Q1	Q2	Q3	Q4
Scope 1	26	27	25	26
Scope 2	4	3	5	3
Scope 3	568	556	579	555

GHG Emissions (2021, Million Tonnes CO2 Equivalent)

GHG Emissions by Scope (2021 Million Tonnes CO2 Equivalent)

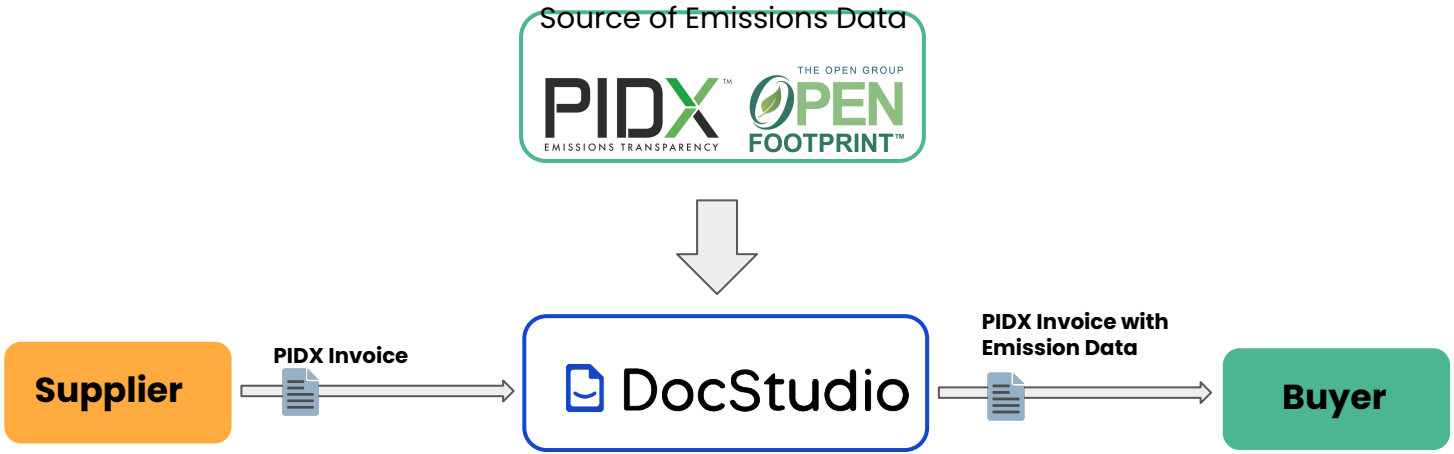


Methodologies

Source of Emissions Data

1 Supplier's Scope 3 Emission Source

2 Standardized and unified source of Emission Data



Dictionary of Emissions Data

Source of Emissions Data

PIDX EMISSIONS TRANSPARENCY

THE OPEN GROUP OPEN FOOTPRINT™

DocStudio Dictionary of Emissions Data

Emissions Data

Allow filtered access | Mailbox | Add column

Description:

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	Emission Product	Emission Product GHG Quantity	Unit Of Measure	Emission Scope	Scope Category	Uncertainty	Methodology	Verification Validity
1	Gas Product A	50	KG	3	1	70%	Estimation	ISO 14064-3:2019
2	Oil Product B	42	KG	3	1	75%	Calculation	GHG Protocol
3	Oil Product D	34	KG	3	3	90%	OEM LifeCycle Audit Method	ISO 14064-3:2019
4	Gas Product E	74	KG	3	1	65%	Calculation	Not Verified
5	Gas Service C	128	KG	3	2	60%	Industry Average Factors	GHG Protocol
6	Gas Product A	45	KG	3	2	70%	Estimation	ISO 14064-3:2020
7	Oil Service F	92	KG	3	3	85%	Estimation	ISO 14064-3:2019
8	Oil Service H	50	KG	3	2	60%	OEM LifeCycle Audit Method	ISO 14064-3:2019
9	Gas Product G	108	MT	3	3	65%	Estimation	Not Verified
10	Oil Product B	87	KG	3	3	75%	Calculation	GHG Protocol
11	Gas Service C	50	KG	3	1	60%	Industry Average Factors	GHG Protocol
12	Oil Product D	59	KG	3	2	90%	OEM LifeCycle Audit Method	ISO 14064-3:2020
13	Oil Service F	90	KG	3	3	85%	Estimation	ISO 14064-3:2020
14	Gas Product G	105	MT	3	3	65%	Estimation	Not Verified

Add row

Q & A

Thank You!

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