PIDX™
INTERNATIONAL

Industrial
Data
eXchange

IDX Project Team Proposal

2.1 Purpose

There is an opportunity to build a new digital industrial data exchange platform by PIDX members for PIDX members.

2.2 Scope

The initiative focuses on building an API-driven and cloud-based industrial data exchange platform to establish and share strategic data sources among the PIDX ecosystem of operators, suppliers, and IT companies.

2.3 Goal

The industrial data exchange platform will: 1) consolidate and share data across the entire ecosystem and empower members to derive their own insights and 2) effectively leverage PIDX's existing and future standards.

2.3.1 Identify criteria for success of the deliverables / specification as deployed in industry.

1) Cloud-based 2) API-driven 3) publishes PIDX standards 4) measured by size of data available in the data exchange 5) measured by number of API calls

2.3.2 Identify all of the stakeholders of which you are aware. Operators, Suppliers, and Marketplaces

All

2.3.3 Identify the stakeholders who are willing to join the work effort. (See Sponsor & Participants)

Chevron, BHGE, Microsoft, and others

IDX Project Team Proposal

2.4 Proposal

There is an opportunity to build a new digital industrial data exchange platform by PIDX members for PIDX members. The initiative focuses on building an API-driven and cloud-based industrial data exchange platform to establish and share strategic data sources among the PIDX ecosystem of operators, suppliers, and IT companies.

The industrial data exchange platform will: 1) consolidate and share data across the entire ecosystem and empower members to derive their own insights and 2) effectively leverage PIDX's existing and future standards. Some example use cases for this industrial data exchange platform include invoice management, virtual management of physical assets, logistics optimization, etc.

4.0 List benefits for all PIDX users

Wider adoption of PIDX standards; ease to consume Opportunity to build data ecosystem across companies for important challenges, e.g. carbon footprint, logistics operations, open manufacturing

IDX Project Team Proposal

5 Sponsor and Participants

PIDX member/company sponsoring development of these specifications/this project:

Member	Company	E-Mail Address
Rachel Shaffer	Chevron	rachel.shaffer@chevron.com
Mandar Moghe	Schlumberger	mmoghe@cameron.slb.com
Trish Nguyen	BHGE	trish.nguyen@bhge.com

Architecture Design - Start with Something Simple

Develop API Interfaces to various master data tables ALREADY managed by PIDX
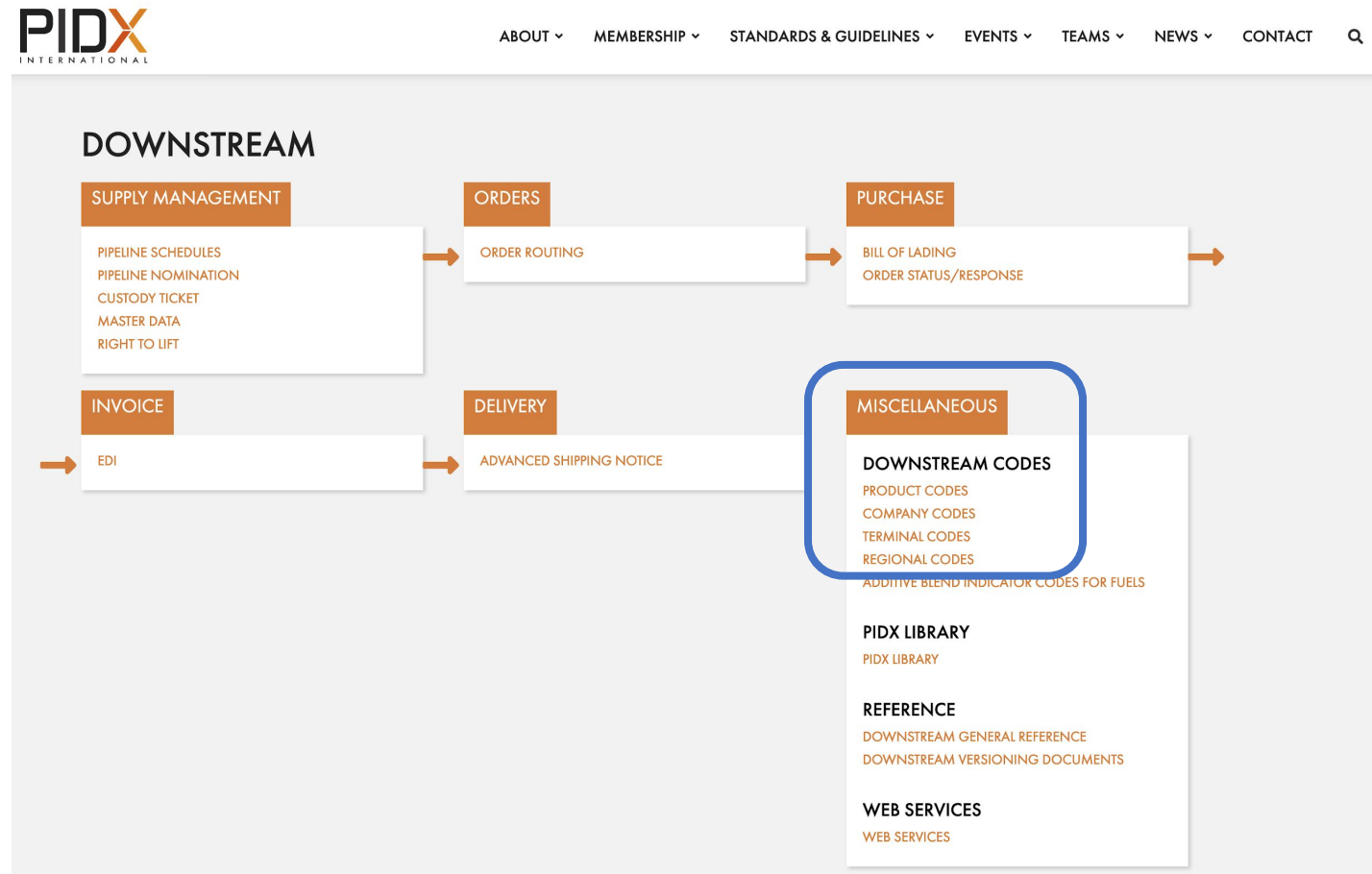
Provide JSON Objects as results

Use existing PIDX Google Cloud Services and deploy an API Server

Architecture Design - Start with Something Simple

Develop API Interfaces to various master data tables ALREADY managed by PIDX

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Use existing PIDX Google Cloud Services and deploy an API Server – **api.pidx.org**

Data Sources – Product Codes

New code requests frequently

Data Sources – Product Codes

New code requests frequently

PIDX INTERNATIONAL™

PIDX Downstream Product Codes

PIDX, Inc Document ID: 04-101-15-45-2010
Version: V
Filename:PIDX-ProductCodes: 10_04_2022.xlsx
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Code 1	Product definition 2	Description 3	Cetane/octane 4	Oxygenated/rbob type 5	Oxygenate percent % v 6	ditized 7	Rvp percentage 8	ulatory oxy % 9	10	msible/siere (f/s) 11	xes 12	Sulphur content 13	h...M12	Comments 14	e code 15	Requester 16	Company 17	Date code assigned 18
A20	AVIATION GASOLINE			N		Y								100/130 LOW LEAD				31-Dec-92
A21	Unbranded Aviation Gasoline 100/LL	AVIATION GASOLINE												AVIATION GASOLINE		BRENT BOWDEN	SHELL	30-Apr-19
A25	AVIATION GASOLINE			N		Y								100/130 HIGH LEAD				31-Dec-92
B00	FUEL ETHANOL	ALTERNATIVE FUEL - Ed79-83		A	79-83	N	7.0-9.5	N	F	N		3 NNNNNNNNNNN		Ed79-83% ETHANOL/21-17% CaRFG3 CARB E85 fuel Class 2		STEVE WOOD	PHILLIPS 66	26-Mar-19
B01	FUEL ETHANOL	ALTERNATIVE FUEL - Ed85		A	85	Y			F	N		3		Ed85 85% ETHANOL/15% REGULAR GASOLINE		JEAN PICKETT	MAGELLAN	20-Jul-04
B02	FUEL ETHANOL	ALTERNATIVE FUEL - Ed80		A	80	Y			F	N		3		Ed80 80% ETHANOL/20% REGULAR GASOLINE		JEAN PICKETT	MAGELLAN	20-Jul-04
B83	FUEL ETHANOL	ALTERNATIVE FUEL - Ed60		A	60	P	7.8	N	F	N		3 NNNNNNNNYNNN		Ed60 60% ETHANOL 40% CBOB LOW RVP		JEAN PICKETT	MAGELLAN	19-Nov-20
B84	SHELL NEMO ADDITIVE	SHELL NEMO ADDITIVE												Nemo 1127 Additive		Michele Iacopino	Gulf Oil LP	17-Sep-21
B85	ETHANOL-FUEL GRADE W/ RIN	ETHANOL-FUEL GRADE W/ RIN														SEAN CORBETT	MUSKET	20-Oct-21
B86	FUEL ETHANOL	ALTERNATIVE FUEL - Ed65		A	65	G		N	F	N		3 NNNNNNNNYNNN		Ed65% ETHANOL/35% RBOB REG		JEAN PICKETT	MAGELLAN	28-Apr-22
B87	FUEL ETHANOL	ALTERNATIVE FUEL - Ed65 TOP TIER		A	65	G		N	F	N		3 NNNNNNNNYNNN		Ed65% ETHANOL/35% RBOB REG - TOP TIER ADDITIZED		JEAN PICKETT	MAGELLAN	28-Apr-22
C00	MIDGRADE	CG	91.5	A	10	G		N	F	N		3 NNNNNNNNYNNN				SARA GLEASON	PHILLIPS	5-Nov-97
C01	MIDGRADE	CG	91.5	A	10	G	9	N	F	N		3 NNNNNNNNYNNN				SARA GLEASON	PHILLIPS	5-Nov-97
C02	MIDGRADE	CG	89	A	10	G		N	F	N		3 NNNNNNNNYNNN				JIM PATTERSON	TEXACO	13-Mar-95
C03	MIDGRADE	CG	88	A	10	G	7	N	F	N		3 NNNNNNNNYNNN		SUBOCTANE		TIM DRINKARD	SHELL OIL PRODUCTS	3-May-13
C0P	MUL 89 VOC2 RFG ETOH 3.5-4.0 T250 USA	RFG	89	A	10	Y		N	F	N		3 NNNNNNNNYNNN		TOP TEIR ADDITIZED		Janie Morales	Shell	29-Jun-18
C0Q	MUL 89 NVOC RFG ETOH 3.5-4.0 T250 USA	RFG	89	A	10	Y		N	F	N		3 NNNNNNNNYNNN		TOP TEIR ADDITIZED		Janie Morales	Shell	29-Jun-18
C0R	MIDGRADE	RBOB	90	O		G	9.0	N	S	N		1 NNNNNYNYNYNN				Denise Kay Schardt	FLINT HILLS	14-Jan-21
C0S	MIDGRADE	RBOB	90	O		G	7.8	N	S	N		1 NNNNNYNYNYNN				Denise Kay Schardt	FLINT HILLS	14-Jan-21
C0T	MIDGRADE	RBOB	90	O		G	13.5	N	S	N		1 NNNNNYNYNYNN				Denise Kay Schardt	FLINT HILLS	14-Jan-21
CPB	MIDGRADE	CG - GPA	88	N		P	9	N	F	N		3 NNNNNNNNYNNN		GPA GASOLINE		RANDY THOMPSON	CONOCOPHILLIPS	8-Oct-04
CPC	MIDGRADE	CG - GPA	88	A	8	P		N	F	N		3 NNNNNNNNYNNN		GPA GASOLINE		RANDY THOMPSON	CONOCOPHILLIPS	8-Oct-04

Data Sources – Company Codes

Infrequent Changes

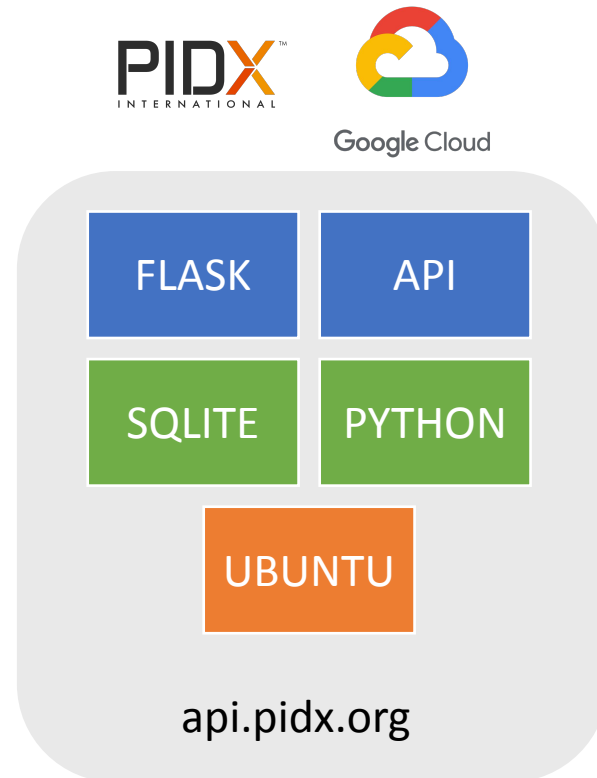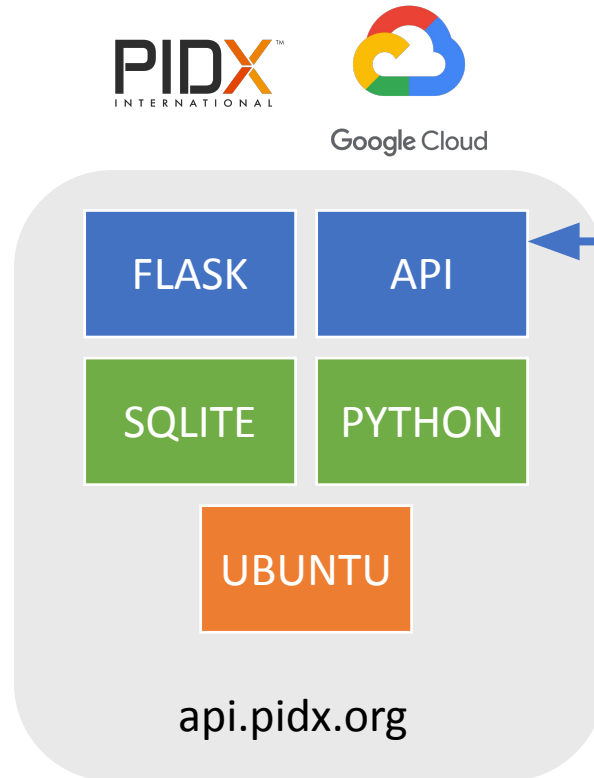|		
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PIDX_Company_Codes_4_1_22.xlsx	Apr 1, 2022 at 10:32 AM	Microso...k (.xlsx)
PIDX_Company_Codes_5_6_22.xlsx	Jul 5, 2022 at 12:19 PM	Microso...k (.xlsx)
PIDX_Company_Codes_9_1_22.xlsx	Sep 1, 2022 at 10:22 AM	Microso...k (.xlsx)
PIDX_Company_Codes_10_3_22.xlsx	Oct 3, 2022 at 8:53 AM	Microso...k (.xlsx)
PIDX_Company_Codes_10-22-20.xlsx	Nov 18, 2020 at 7:00 AM	Microso...k (.xlsx)

DOWNSTREAM CODES
PRODUCT CODES
COMPANY CODES
TERMINAL CODES

IDX

PIDX Downstream Company Codes

PIDX, Inc Document ID: 04-102-15-45-2012

Version: 3-2-2022

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and the PIDX Antitrust Guidelines, a copy of which is available at www.pidx.org/antitrust.

File Name: _PIDX_Company_Codes_3_2_2022.xlsx

NOTE: non-North American companies begin with 8 or 9 and may utilize 3 positions

obsolete - closed - sold NO LONGER IN USE

possibly unused

To assign a new code or retire one that is obsolete, please contact companycodes@pidx.org.

Co	Company name	Address	City	St	Zip	Phone	Contact	Contacts	Assigned
01	Stonewin LLC	333 SE 2nd Ave STE 2000	Miami	FL	33131	305.301.1178	Keith Harvin	kh@stonewin.org	02.22.21
02	J. Global Energy Inc	440 Louisiana ST, STE 1818	Houston	TX	77002	281.455.3139	Blake Hale	blake.hale@jglobalenergy.com	03.23.21
03	Ingleside placeholder								
04	Antler Energy	109 Breeze Ridge	San Antonio	TX	78260	210.347.1632	Luke Kinney		04.27.21
05	Mac's Convenience Stores	P.O. Box 347	Columbus	IN	47202	812.379.9227	Alex Miller	tmiller3@circlek.com	5.5.15
06	Truenorth Energy, LLC	10346 Brecksville, Rd	Brecksville	OH	44141	440-792-4200 x 108	Mary B. Lyden	mblyden@truenorth.org	5.13.15
07	Don Erickson Oil, Inc	1031 Nixon Rd	Mt Shasta	CA	96067	530.926.2675	Sheila Johnson	sheila johnson	5.15.15
08	Empire Petroleum Partners LLC	8350 N. Central Expressway, M2185	Dallas	TX	75206	972.684.5507	Eugene Gonzalez	egonzalez@empirepetroleum.com	11.7.16
09	Mercuria energy trading (phillips 66)	20 e greenway plaza ste 650	houston	tx	77046	832-209-2431	Maria Elizalde		
10	JK Petroleum Inc	4668 Amboy Rd	Staten Island	NY	10312	718.984.9551	Mike	jkpetroleum@aol.com	5.19.15
11	Jenkins Oil Co	1100 W. Industrial Rd	Cedar City	UT	84720	435.58.6931	Andrea Johnson	andy@jenkinsoil.com	12.2.16
12	Sommers Oil	1000 Sommers Blvd	Richmond	GA		912.312.3648	Brenda Sommers	Brenda.Sommers@sommersoil.com	5.21.15
13	Eight-eight Oil	455 N. Poplar	Casper	WY	82062	307.237.9301	G. C. Herz		5.26.15
14	United Fuel Supply	3950 S. 700 E. Suite 202	Salt Lake City	UT	84407	801.327.8696	Rodney Anderson		6.3.15
15	Woodford Oil Company	13th & Livingston Box 567	Elfins	WV	26241	304-591-1196	Roger Corder	rcorder@woodfordoil.com	6.10.15
16	Romine Oil Co	837 E. Collin Raye	DeQueen	AR	71832	870-584-3417	Jim	jim3417@alltel.net	6.10.15
17	Costco	999 Lake Drive	Issaquah	WA	98027	425.416.5251	Naill Alnatour	nalnatour@costco.com	6.18.15
18	Almond Oil Co.	504 se Williston Rd	Gainesville	FL	32641	352.376.5131	Chris Almond	calmond@almondoilcompany.com	6.25.15
19	Bretthauer Oil Co	453 SW Washington St.	Hillsboro	OR	97123	503-648-2531	Kevin Bretthauer	kevin@bretthauer.com	6.29.15
20	Southwest Convenience Stores	4001 Penbrook, Suite 400	Odessa	TX	79762	432.438.6241	Scott Prall	scott.prall@alonusa.com	6.30.15
21	Superior Plus Energy Services	8199 McKnight Rd	Pittsburgh	PA	15237	412.364.2200	David Chetsko	dchetsko@superiorpetroleumcompan	7.20.15
22	Targray Industries	18105 Transcanada	Kirkland	QC	H9J3Z4				7.27.15
23	Hartley Co	319 Wheeling Ave	Cambridge	OH	43725	740.432.2328	Tim Mulrooney	tmulrooney@thehartleyco.com	7.28.15
24	APEX Oil - St. Louis	8235 Forsyth Blvd.	St. Louis	MO	63105	314.889.9600	David Paul	dpaul@apexoil.com	7.30.15
25	Associated Asphalt Partners, LLC	130 Church Ave SW	Roanoke	VA	24011	540-853-4307	Doug Crowe	dcrowe@associatedasphalt.com	8.3.15
26	Quest Distributors	1777 NE Loop 410	San Antonio	TX	78217	210.826.3786	Ashraf Sarfani	info@quest-fuel.com	8.4.15
27	United Energy Trading	225 Union Blvd	Lakewood	CO		303.991.3435	Tim Penney	tpenney@uellc.com	8.12.15
28	Tullos Bros Inc	61 Lincoln Hwyy	South Kearney	NJ	7032	973.463.7701	Alex Tullo	alexjr@tullotransport.com	8.17.15
29	Bazell Oil	15140 State Rt 328 Box 2	Logan	OH	43138	740-385-5430	Joe Wolf	joe@bazellfuels.com	8.17.15
30	Dozier Oil Co	1919 Hwy 43 North	Thomasville	AL	36784	334.636.2116	Brad Gibson	brad@dozieroilandtire.com	8.17.15
31	Beaudry Oil	630 proctor ave nw	Elk River	MN	55330	763.441.2383	Kenneth Beaudry		11.19.15
32	SLIDELL OIL CO, INC	2307 GAUGE BLVD. E	SLIDELL	LA	70461	985.643.5256	GEORGE WEST	GWEST@SLIDELLOIL.COM	12.15.16
33	DIESEL DIRECT	P.O. BOX 135	RANDOLPH	MA	2386	800.900.7787	TIM CALLOW	TCALLOW@DIESELDIRECT.COM	6.8.17
34	Super Petroleum	25 Braintree Hill Office Park #409	Braintree	MA	2184	781.356.1960 x36	Curtis Akins	cakins@superpetroleum.com	9.2.15
35	F.L.Roberts	P.O. Box 1964	Springfield	MA	1102	413.781.7444	Frank Roberts	froberts@flroberts.com	9.4.15
36	Sunoco Partners Marketing & Terminals	1801 Market St	Philadelphia	PA	19103	215.246.8468	Connie Blinebury	cmblinebury@sunocoinc.com	9.11.15

Data Sources – Terminal Codes

Mostly Static Data

	Submitter	Terminal Owner Name	TERMINAL ID	Address	TERMINAL CITY/TOWN/LOCALITY	TERMINAL COUNTY/PROVINCE	TERMINAL POSTAL CODE	TERMINAL COUNTRY	TERMINAL GEO COORDINATES
2	Shell	BotanyBay B Vopak depot	TAU000001	49 Friendship Road	Port Botany		2036	Australia	
3	Shell	Botn Vopak BitDepot	TAU000002	Unwin Street	Granville		2142	Australia	
4	Shell	Kwinana Coogee depot	TAU000003	Patterson Road	Kwinana		6167	Australia	
5	Shell	Hobart Caltex depot	TAU000004	Selfs Point Road	New Town		7008	Australia	
6	Shell	DarwinEArm Vopak depot	TAU000005	780 Berrimah Road	East Arm		0828	Australia	
7	Shell	Shell/BP Newcastle	TAU000006	5 Chatham Road	Hamilton		2303	Australia	
8	Shell	Shell/Caltex Pt Hedland	TAU000007	Wilson Street	Port Hedland		6721	Australia	
9	Shell	Newcastle Stolthv depot	TAU000008		Newcastle		2300	Australia	
10	Shell	Birkenhead Mobil depot	TAU000009	Elder Road	Birkenhead		5015	Australia	
11	Shell	Gladstone BP depot	TAU000010	McLintock Street	Gladstone		4680	Australia	
12	Shell	Geelong	TAU000011		Geelong			Australia	
13	Shell	Shell Austria GmbH - Linz	TAT000001	Am Tankhafen 6	Linz		A-4020	Austria	
14	Shell	Shell Austria GmbH - Lobau	TAT000002	Lobgrundstrasse 3	Wien		A-1220	Austria	
15	OMV	OMV R&M GmbH	TAT000003	Mannswörtherstraße 28	Schwechat		2320	Austria	
16	OMV	OMV R&M GmbH	TAT000004	Lobgrundstraße 2	Lobau		1223	Austria	
17	OMV	OMV R&M GmbH	TAT000005	Wienerstraße 5	St. Valentin		4300	Austria	
18	DCC Energy Austria	DCC Energy Austria GmbH - Graz	TAT000006	Alte Poststraße 400	Graz		8055	Austria	
19	DCC Energy Austria	DCC Energy Austria GmbH - Klagenfurt	TAT000007	Flatschacherstraße 87	Klagenfurt		9020	Austria	
20	DCC Energy Austria	DCC Energy Austria GmbH - Innsbruck	TAT000008	Karwendelstraße 3	Innsbruck		6020	Austria	
21	OMV	OMV R&M GmbH	TAT000009		Schwechat		2320	Austria	
22	Shell	TBG	TAT000010		Salzburg			Austria	
23	Argos	Argos (Varo)	TBE000001	Wiedauwkaai 75	Ghent	Oost-Vlaanderen	B-9000	Belgium	
24	Argos	Argos (Varo)	TBE000002	Aarschotseweg 26	Herentals	Antwerpen	B-2200	Belgium	
25	Argos	Argos (Varo)	TBE000003	Schaarbeeklei 600	Vilvoorde	Vlaams-Brabant	B-1800	Belgium	
26	Argos	Argos (Varo)	TBE000004	Herderstraat 8	Hasselt	Limburg	B-3500	Belgium	
27	Argos	Argos (Varo)	TBE000005	Pathoekeweg 74	Brugge	West-Vlaanderen	B-8000	Belgium	
28	Argos	Argos (Varo)	TBE000006	Bossuitstraat 9	Bossuit-Avelgem	West-Vlaanderen	B-8583	Belgium	
29	ExxonMobil	ExxonMobil	TBE000007	Scheldelaan	Antwerpen		B-2030	Belgium	
30	ExxonMobil	ExxonMobil	TBE000008	Rue Ernest Solvay 339	SCLESSIN		B-4000	Belgium	
31	ExxonMobil	ExxonMobil	TBE000009	Rue de l'Ancienne Poetnce 18	TOURNAI		B-7501	Belgium	
32	Vopak	Vopak Terminal ACS	TBE000010	Scheldelaan 410 Port no. 503	Antwerpen		B-2040	Belgium	
33	Vopak	Vopak Terminal Linkeroever	TBE000011	Haandorpweg Port no. 1313	Kallo		B-9130	Belgium	
34	Vopak	Vopak Terminal Eurotank	TBE000012	Industrieweg 16 Port no. 399	Antwerpen		B-2030	Belgium	
35	Argos	Argos (Varo)	TBE000013	Pantserschipstraat 301	Ghent	Oost-Vlaanderen	B-9000	Belgium	
36	Argos	Alca	TBE000014	D'Herbouvillekaai 103	Antwerpen		B-2020	Belgium	
37	Argos	BML	TBE000015	Rue du Dossay 2	Liège		B-4020	Belgium	
38	Argos	Vesta	TBE000016	Scheldelaan 470	Antwerpen		B-2040	Belgium	
39	ExxonMobil	Total	TBE000017		Feluy			Belgium	
40	ExxonMobil	LukOil	TBE000018		Neder-over-Heembeek		B-1120	Belgium	
41	ExxonMobil	Total	TBE000019		Wandre			Belgium	
42	ExxonMobil	UniTank	TBE000020	Regenbeekstraat 60	Roeselare		8800	Belgium	
43	ExxonMobil	Total	TBE000021	Hendrik Baelskaai 10a	Oostende		8400	Belgium	
44	Argos	Argos (Varo)	TBE000022	Wondelgemkaai 142	Ghent	Oost-Vlaanderen	B-9000	Belgium	
45	Argos	Argos (Varo)	TBE000023	Rue de Berloz 3	Liege	Liege	B-4000	Belgium	
46	Argos	Argos (Varo)	TBE000024	Kanaaldijk 3	Brussel (Anderlecht)	Bruxelles	B-1070	Belgium	
47	Shell	PPST (Joint Q8/Delek)	TBE000025	Avenue de l'Indépendance 93	Wandre		4020	Belgium	

Architecture Overview

Architecture Overview

http://api.pidx.org:8080/api/v1/resources/codes/all

FLASK

API

SQLITE

PYTHON

UBUNTU

api.pidx.org

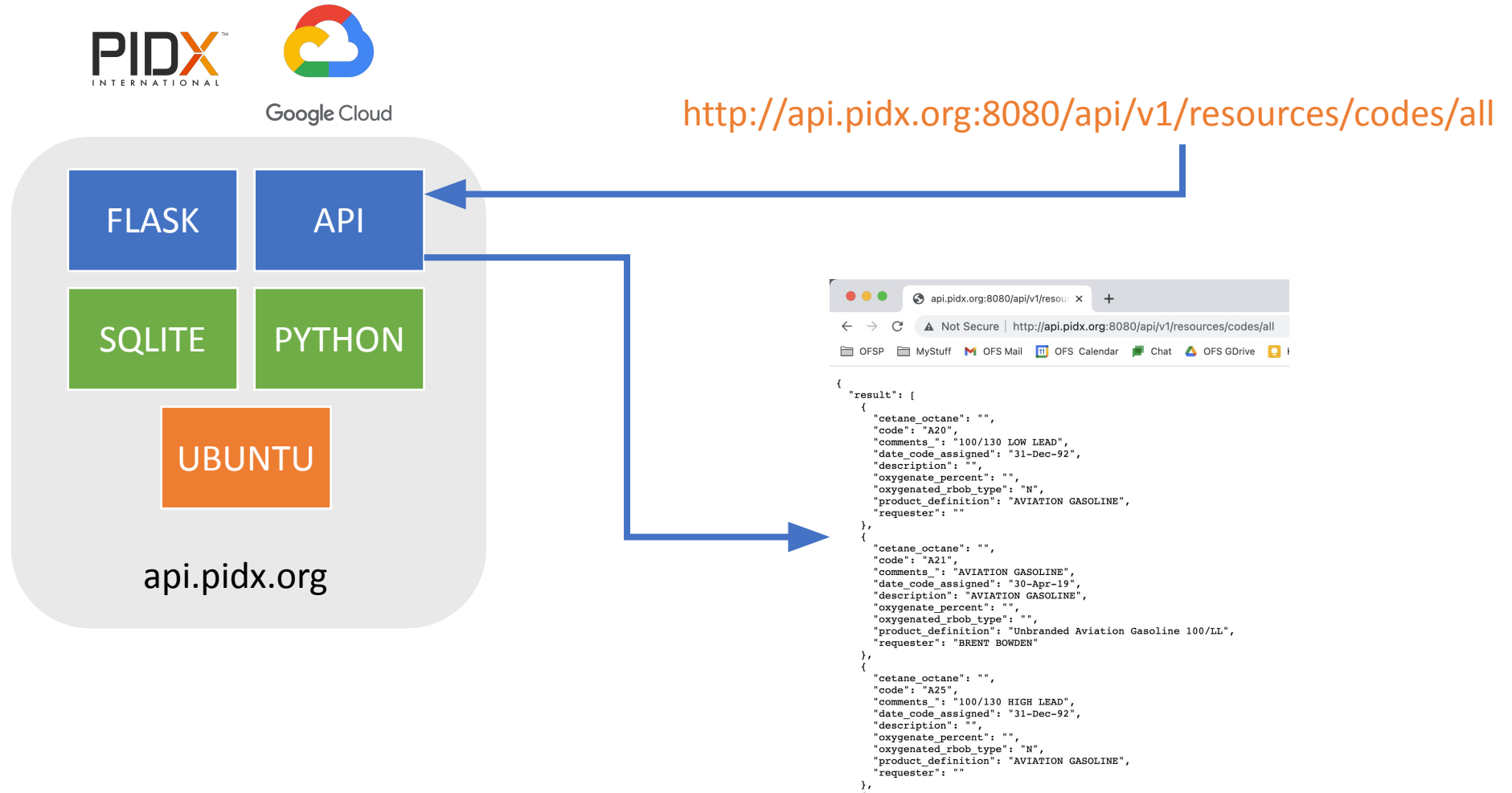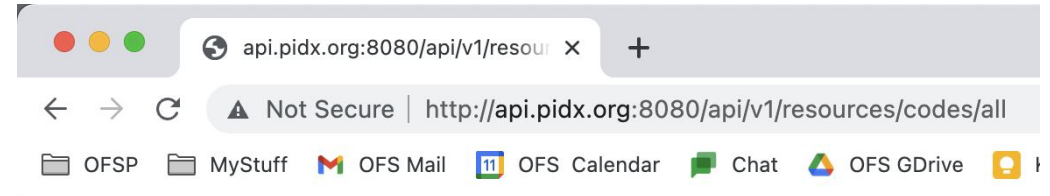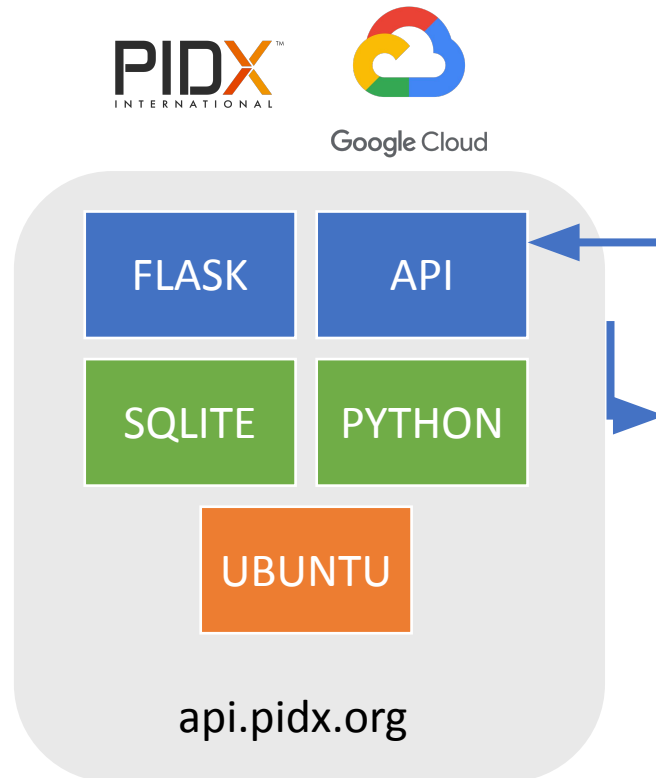# Architecture Overview

Architecture Overview

codes/all

```json
{
    "result": [
        {
            "cetane_octane": "",
            "code": "A20",
            "comments_": "100/130 LOW LEAD",
            "date_code_assigned": "31-Dec-92",
            "description": "",
            "oxygenate_percent": "",
            "oxygenated_rbob_type": "N",
            "product_definition": "AVIATION GASOLINE",
            "requester": ""
        },
        {
            "cetane_octane": "",
            "code": "A21",
            "comments_": "AVIATION GASOLINE",
            "date_code_assigned": "30-Apr-19",
            "description": "AVIATION GASOLINE",
            "oxygenate_percent": "",
            "oxygenated_rbob_type": "",
            "product_definition": "Unbranded Aviation Gasoline 100/LL",
            "requester": "BRENT BOWDEN"
        },
        {
            "cetane_octane": "",
            "code": "A25",
            "comments_": "100/130 HIGH LEAD",
            "date_code_assigned": "31-Dec-92",
            "description": "",
            "oxygenate_percent": "",
            "oxygenated_rbob_type": "N",
            "product_definition": "AVIATION GASOLINE",
            "requester": ""
        },
```

DEMO

http://api.pidx.org:8080/api/v1/resources/codes/all

Architecture Overview – Production Ready

http://api.pidx.org:8080/api/v1/resources/codes/all

api.pidx.org
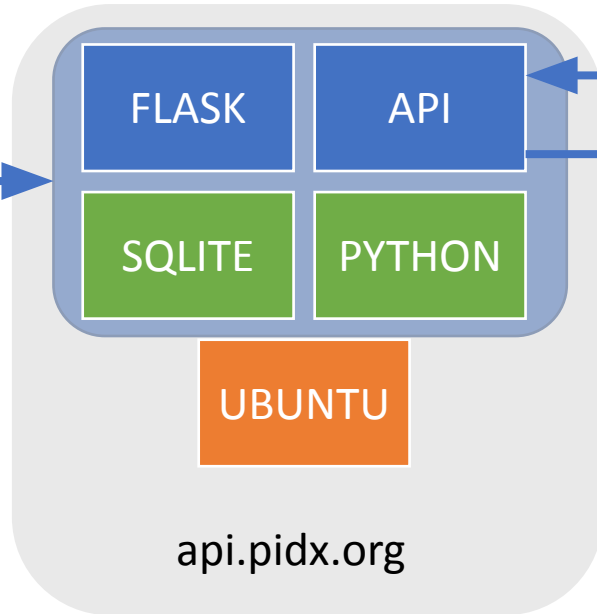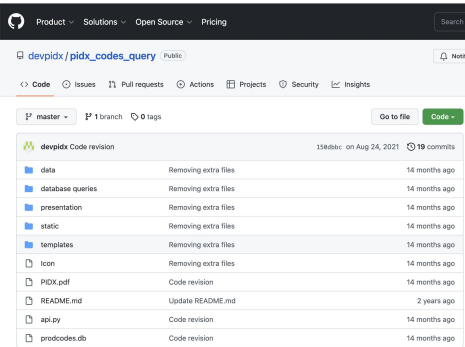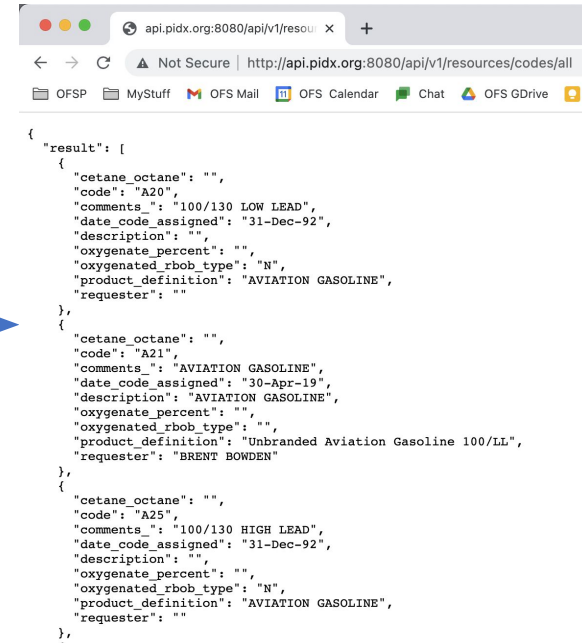
PIDX Product Codes

API Interface to master data

 Return JSON Object with all Master Data from API Web Call

 http://api.pidx.org:8080/api/v1/resources/codes/all

API Searchable Interface to master data

 Return JSON Object with subset of Master Data from API Web Call

 Searchable Product Codes API Examples

 http://api.pidx.org:8080/api/v1/resources/codes?code=B22

PIDX Product Codes

API Interface to master data

Searchable Product Codes API Examples

http://api.pidx.org:8080/api/v1/resources/codes?code=B22

result:
  0:
    cetane_octane: ""
    code: "B22"
    comments_: "Ed80 80% ETHANOL/20% RBOB REG 85"
    date_code_assigned: "10-May-11"
    description: "ALTERNATIVE FUEL – Ed80"
    oxygenate_percent: "80"
    oxygenated_rbob_type: "A"
    product_definition: "FUEL ETHANOL"
    requester: "JEAN PICKETT"

```
{
    "result": [
        {
            "cetane_octane": "",
            "code": "B22",
            "comments_": "Ed80 80% ETHANOL/20% RBOB REG 85",
            "date_code_assigned": "10-May-11",
            "description": "ALTERNATIVE FUEL – Ed80",
            "oxygenate_percent": "80",
            "oxygenated_rbob_type": "A",
            "product_definition": "FUEL ETHANOL",
            "requester": "JEAN PICKETT"
        }
    ]
}
```

PIDX Product Codes

API Interface to master data

Searchable Product Codes API Examples

http://api.pidx.org:8080/api/v1/resources/codes?code=B22

result:
  0:
    cetane_octane: ""
    code: "B22"
    comments_: "Ed80 80% ETHANOL/20% RBOB REG 85"
    date_code_assigned: "10-May-11"
    description: "ALTERNATIVE FUEL - Ed80"
    oxygenate_percent: "80"
    oxygenated_rbob_type: "A"
    product_definition: "FUEL ETHANOL"
    requester: "JEAN PICKETT"

```json
{
    "result": [
        {
            "cetane_octane": "",
            "code": "B22",
            "comments_": "Ed80 80% ETHANOL/20% RBOB REG 85",
            "date_code_assigned": "10-May-11",
            "description": "ALTERNATIVE FUEL - Ed80",
            "oxygenate_percent": "80",
            "oxygenated_rbob_type": "A",
            "product_definition": "FUEL ETHANOL",
            "requester": "JEAN PICKETT"
        }
    ]
}
```

DEMO

http://api.pidx.org:8080/api/v1/resources/codes?code=B22

PIDX Product Codes

PIDX Google Cloud Services – API Server – api.pidx.org

API Interface to master data
Product Codes
http://api.pidx.org:8080/api/v1/resources/codes/all

Searchable Product Codes
http://api.pidx.org:8080/api/v1/resources/codes?code=B22

Codes by Country
http://api.pidx.org:8080/data

API Enablement with JSON Web Services

Python Code & Flask

```
coo@pidx-api-dev-001:/opt/app/gce$ cat main.py
import flask
from flask import request, jsonify
from flask_cors import CORS
from flask import render_template
import sqlite3
import json


app = flask.Flask(__name__)
app.config["DEBUG"] = True
CORS(app)


def dict_factory(cursor, row):
    d = {}
    for idx, col in enumerate(cursor.description):
        d[col[0]] = row[idx]
    return d


# -----If no URL route is found, return 404 not found error-----
@app.errorhandler(404)
def page_not_found(e):
    return "<h1>PIDX API Server - 404</h1><p> </p><p>The resource could not be found.</p>", 404


# -----Default root URL node, display index.html from the templates folder-----
# Sample Call http://api.pidx.org:8080/
@app.route('/', methods=['GET'])
def api_home():
    message = "PIDX Code Server"
    return render_template('index.html', message=message)


# -----A route to return all of the available entries in our catalog-----
# Sample Call http://api.pidx.org:8080/api/v1/resources/codes/all
@app.route('/api/v1/resources/codes/all', methods=['GET'])
def api_code_data():
    conn = sqlite3.connect('prodcodes.db')
    conn.row_factory = dict_factory
    cur = conn.cursor()
    all_product_codes = cur.execute('SELECT * FROM prodcodes;').fetchall()
    conn.close()
    return jsonify({'result': [dict(row) for row in all_product_codes]})
#     return jsonify({[dict(row) for row in all_product_codes]})
```
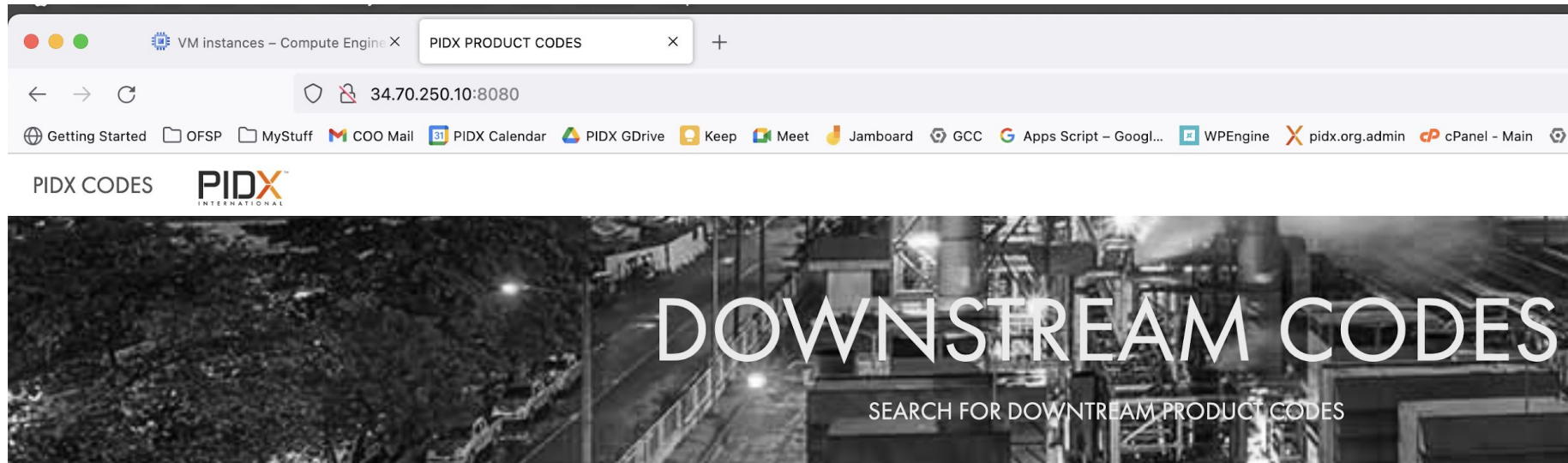
Error Handler

Searchable JS Web Form

Get all PRODUCT codes

API Enablement with JSON Web Services

https://github.com/devpidx/pidx_codes_query

PIDX Product Codes

Web User Search Interface to master data

PIDX INTERNATIONAL

Industrial Data eXchange

DEMO

http://api.pidx.org:8080/

IDX Next Steps

Web Search Development

Downstream group to lead development of Web Search Interface

Convert Data Maintenance to Tables and Migrate Away from Excel Downloads

PIDX Office Tea to support maintenance of the data tables via current request interface

Change output and use API JSON Object Request/Response

Ability to call API to retrieve an XLS version of the table data

Automated Data Extracts for PIDX Members

Assist PIDX Members to implement true machine to machine updates for data

Push Notifications

Date based data "Give me all records changed since our last extract on Sunday"