

JODI-Gas Data Quality Assessment

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17th APEC Workshop on Energy Statistics

Joint APEC-JODI Workshop on Oil and Gas Statistics

11-13 June 2019. Tokyo, Japan



Content

- Data Reporting Mechanism (Questionnaires and Definitions)
- Data Transparency, Accessibility and Usability
- Data Validation Process, Techniques and Tools
- Participation Assessment
- Consistency with Other Data Sources

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- Data Reporting Mechanism (Questionnaires and Definitions)
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Data Reporting Mechanism (Questionnaire and Definitions)

Definitions


- Is it growth Indigenous Production or Dry Marketable Production?
- How to report Transit Gas?








Units

- Volumetric, Energy and Mass Units.
(mind the conversion factors!)

Meta Data

- Info about deviations from the definitions or explanation about unusual data.

JOINT ORGANISATION DATA INITIATIVE - GAS QUESTIONNAIRE			
		Country	<input type="text"/>
		Month	<input type="text"/>
		Year	<input type="text"/>
			
	Natural Gas in million m ³ (at 15°C, 760 mm hg)	Natural Gas in Terajoules	Natural Gas (LNG) in 1000 metric tons
Production			
Receipts from Other Sources			
Imports			
LNG			
Pipeline			
Exports			
LNG			
Pipeline			
Stock Change			
Gross Inland Deliveries (Calculated)	0	0	
Statistical Difference (Calculated)	0	0	
Gross Inland Deliveries Observed			
of which: Electricity and Heat Generation			
Closing stocks			
Mass to volume conversion factor of LNG (if you have specific figure)			
	m ³ /metric ton	LNG	
Conversion factor	<input type="text"/>	<input type="text"/>	

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Data Transparency, Accessibility and Usability

JODI Website



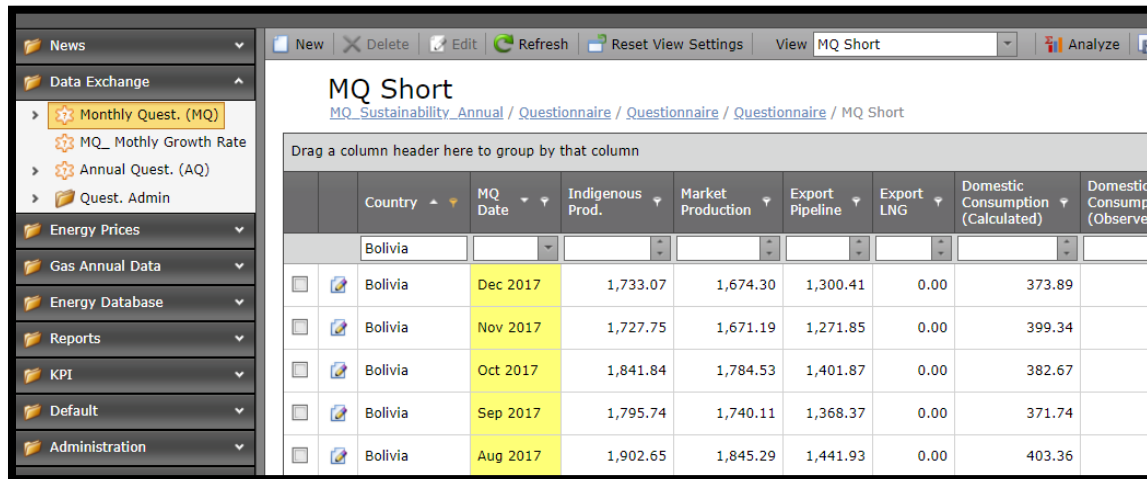
Country	TIME	2009-01	2009-02	2009-03	2009-04	2009-05	2009-06	2009-07	2009-08	2009-09
Oman		0	0	0	0	0	0	0	0	
Papua New Guinea		0	0	0	0	0	0	0	0	
Peru		359	310	374	334	394	413	437	448	4
Philippines		249	272	320	323	341	331	351	335	3
Poland		0	0	0	0	0	0	0	0	
Portugal		0	0	0	0	0	0	0	0	
Qatar		0	0	0	0	0	0	0	0	
Romania		0	0	0	0	0	0	0	0	
Russian Federation		54,012	48,814	48,166	43,369	39,629	36,106	40,949	42,851	45.2
Singapore		0	0	0	0	0	0	0	0	
Slovak Republic		0	0	0	0	0	0	0	0	
Slovenia		0	0	0	0	0	0	0	0	
South Africa		0	0	0	0	0	0	0	0	
Spain		0	0	0	0	0	0	0	0	
Sweden		0	0	0	0	0	0	0	0	
Switzerland		0	0	0	0	0	0	0	0	
Thailand		2,529	2,183	2,667	2,379	2,762	2,567	2,544	2,576	2.5
Trinidad/Tobago		0	0	0	0	0	0	0	0	
Tunisia		0	0	0	0	0	0	0	0	
Turkey		0	0	0	0	0	0	0	0	
Ukraine		0	0	0	0	0	0	0	0	

You can download JODI databases in IVT and CSV file formats from <https://www.jodidata.org> website.

Data Transparency, Accessibility and Usability

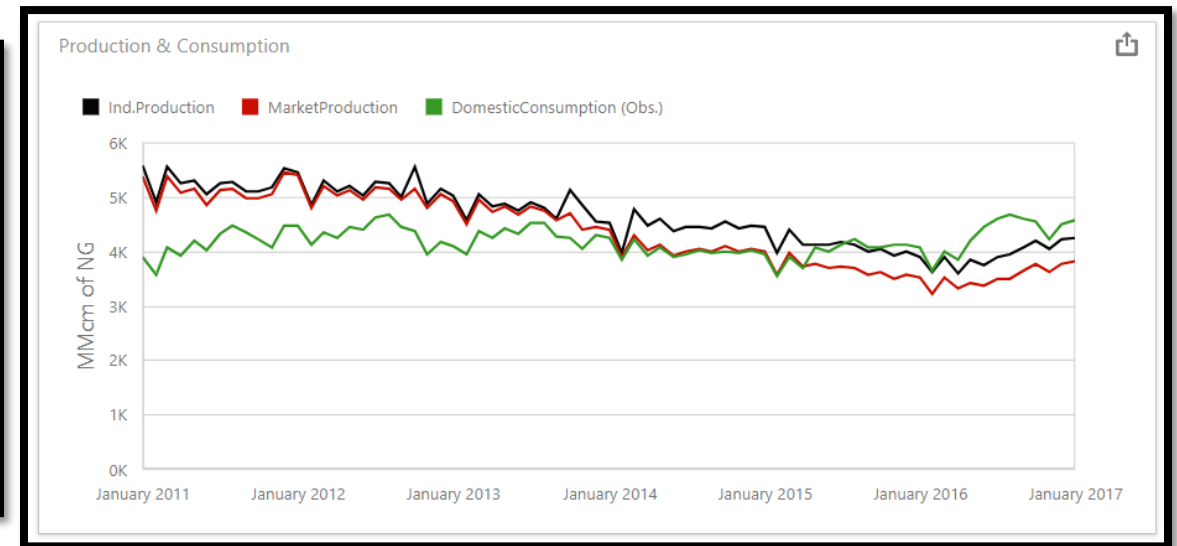
GECF Data Exchange Center (DEC) System

- Web-based data collection, analysis and reporting system accessible to all GECF Member Countries.



The screenshot shows the GECF Data Exchange Center (DEC) system interface. On the left is a navigation menu with categories like News, Data Exchange, Energy Prices, Gas Annual Data, Energy Database, Reports, KPI, Default, and Administration. The main area displays a table titled 'MQ Short' for Bolivia. The table has columns for Country, MQ Date, Indigenous Prod., Market Production, Export Pipeline, Export LNG, Domestic Consumption (Calculated), and Domestic Consumption (Observed). The data rows are for Dec 2017, Nov 2017, Oct 2017, Sep 2017, and Aug 2017.

	Country	MQ Date	Indigenous Prod.	Market Production	Export Pipeline	Export LNG	Domestic Consumption (Calculated)	Domestic Consumption (Observed)
	Bolivia							
<input type="checkbox"/>	Bolivia	Dec 2017	1,733.07	1,674.30	1,300.41	0.00	373.89	
<input type="checkbox"/>	Bolivia	Nov 2017	1,727.75	1,671.19	1,271.85	0.00	399.34	
<input type="checkbox"/>	Bolivia	Oct 2017	1,841.84	1,784.53	1,401.87	0.00	382.67	
<input type="checkbox"/>	Bolivia	Sep 2017	1,795.74	1,740.11	1,368.37	0.00	371.74	
<input type="checkbox"/>	Bolivia	Aug 2017	1,902.65	1,845.29	1,441.93	0.00	403.36	

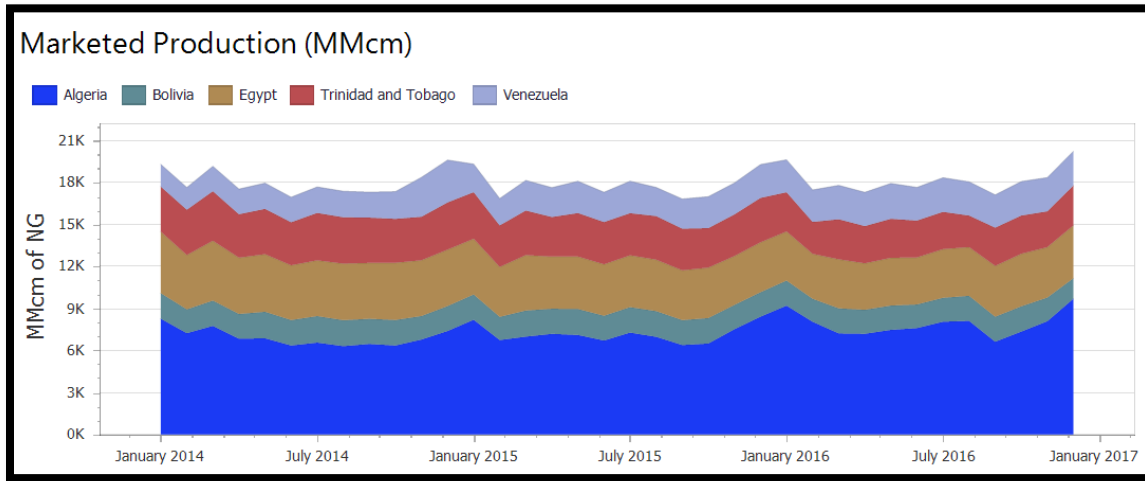


DEC User can retrieve gas (and other energy) data, use system dashboards for analysis or quality check
Everything can be exported to Excel

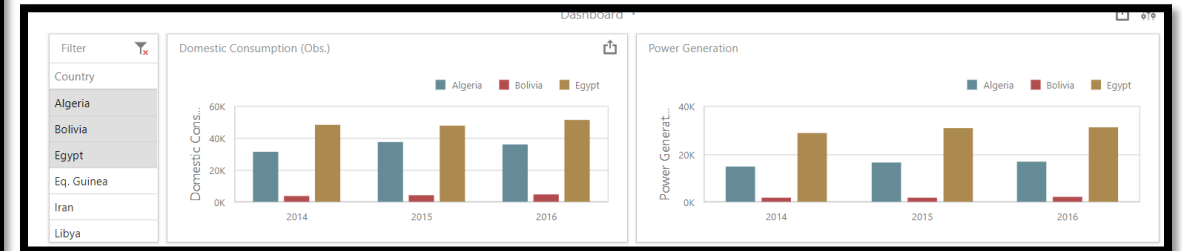
Data Transparency, Accessibility and Usability

GECF Data Exchange Center (DEC) System

- Analysis Dashboards



Share of each country in GECF Production

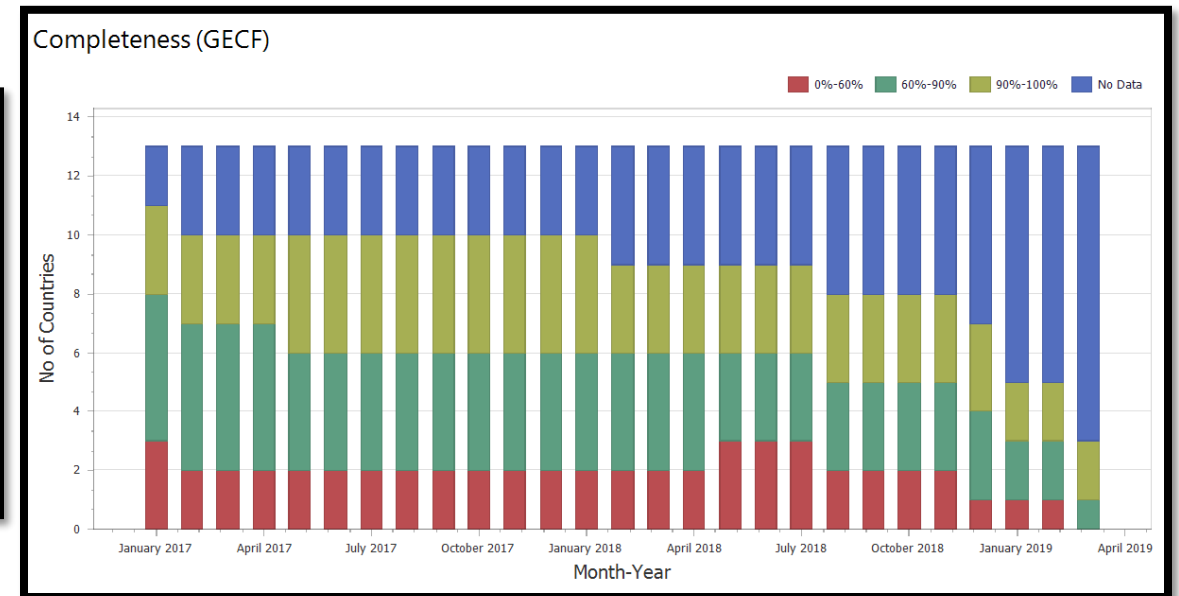
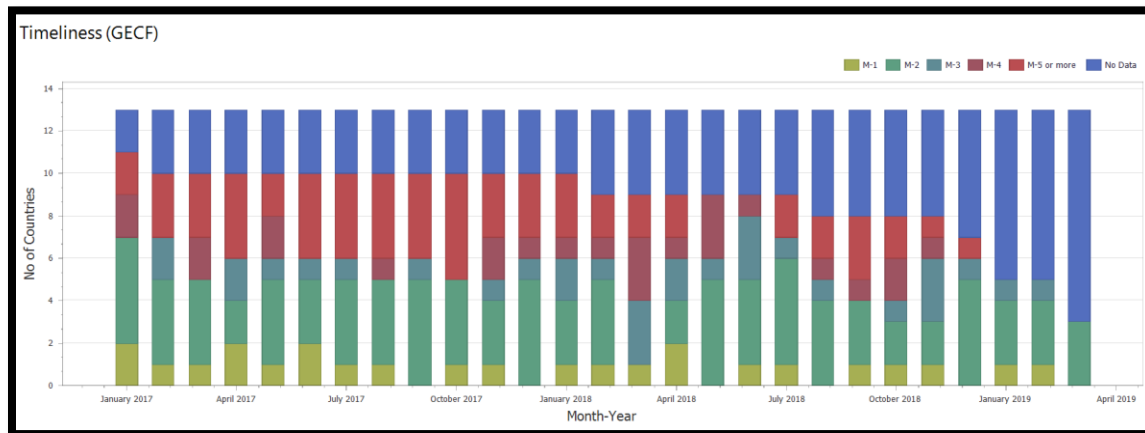


Country Comparison - Annual Gas Consumption in Power Sector

Data Transparency, Accessibility and Usability

GECF Data Exchange Center (DEC) System

- Quality Dashboards



DEC System automatically generates statistics and charts of Sustainability, Timeliness and Completeness. These are openly accessible to all GECF countries to achieve full transparency.

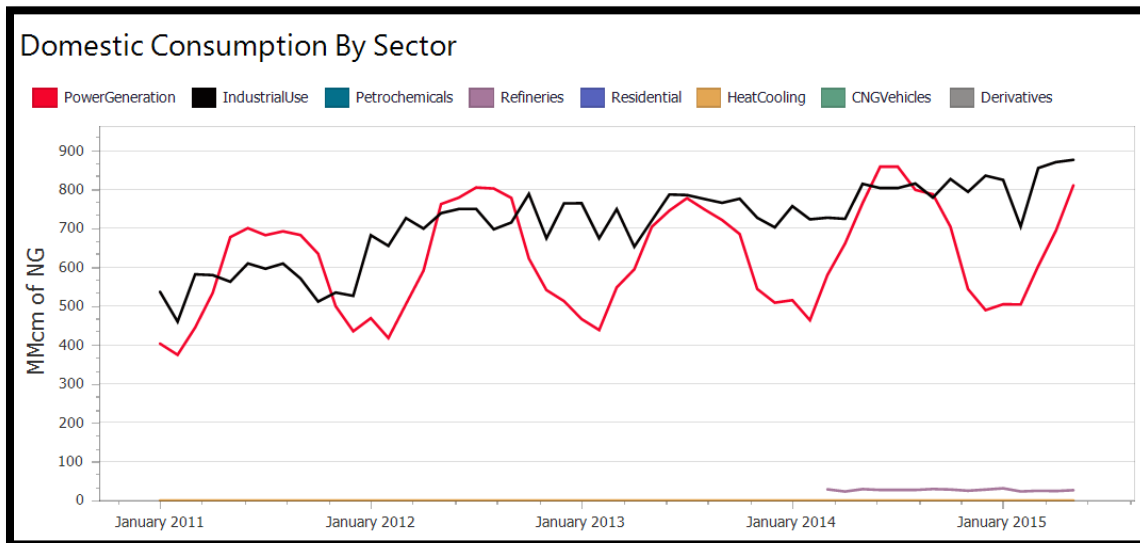
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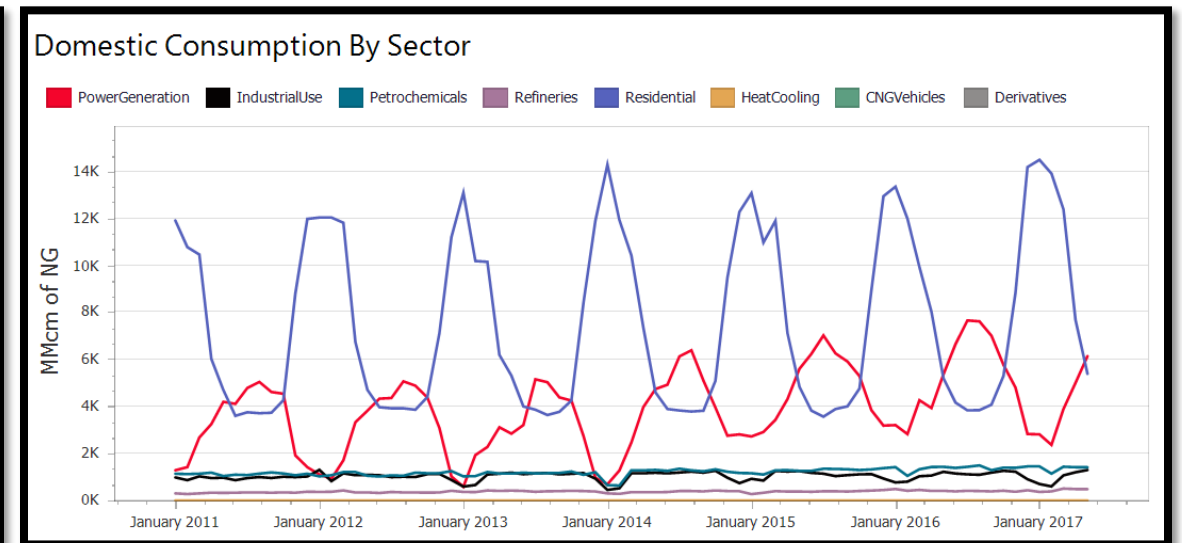
Data Validation Process, Techniques and Tools

Time Series / Visual Checks

- Seasonal Patterns



Red Line = Gas consumed in Power Sector
(the peaks are during summer time)



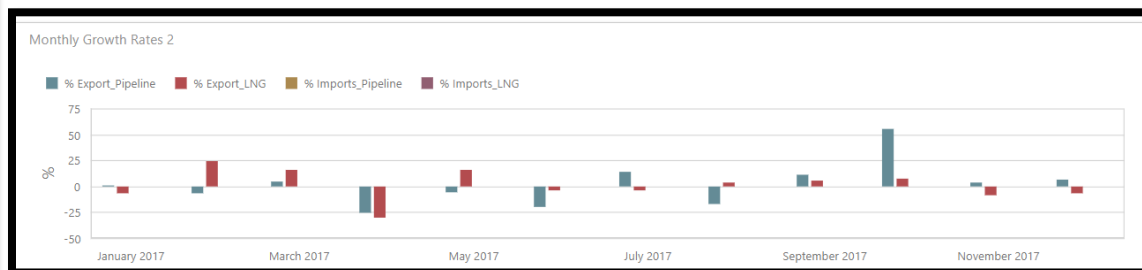
Blue Line = Gas consumed in Heating at residential
(the peaks are during winter time)

Data Validation Process, Techniques and Tools

Time Series / Visual Checks

- Monthly Changes

Questionnaire Date	Indigenous Production	Market Production	Export Pipeline	Export LNG	Domestic Consumption Observed	Power Generation
Dec 2017	7.3 %	0.7 %	6.2 %	-6.8 %	-1.4 %	14.1 %
Nov 2017	0.2 %	10.6 %	3.4 %	-8.9 %	33.0 %	-9.5 %
Oct 2017	3.2 %	25.1 %	55.4 %	7.5 %	7.6 %	-1.6 %
Sep 2017	-4.0 %	-0.8 %	11.2 %	5.8 %	-10.6 %	3.4 %
Aug 2017	-0.4 %	-5.1 %	-16.9 %	3.2 %	-0.2 %	-30.6 %
Jul 2017	1.3 %	14.7 %	13.4 %	-3.7 %	26.9 %	24.7 %
Jun 2017	-2.0 %	-11.3 %	-19.8 %	-4.4 %	-6.0 %	23.5 %
May 2017	-0.2 %	-3.3 %	-5.8 %	15.8 %	-10.8 %	8.7 %
Apr 2017	-5.0 %	-25.4 %	-25.3 %	-29.8 %	-24.1 %	-8.0 %
Mar 2017	10.5 %	0.9 %	4.7 %	15.6 %	-6.4 %	18.1 %
Feb 2017	-6.1 %	-4.4 %	-7.0 %	24.5 %	-12.4 %	-10.3 %
Jan 2017	0.6 %	0.5 %	1.0 %	-6.7 %	2.8 %	-15.1 %



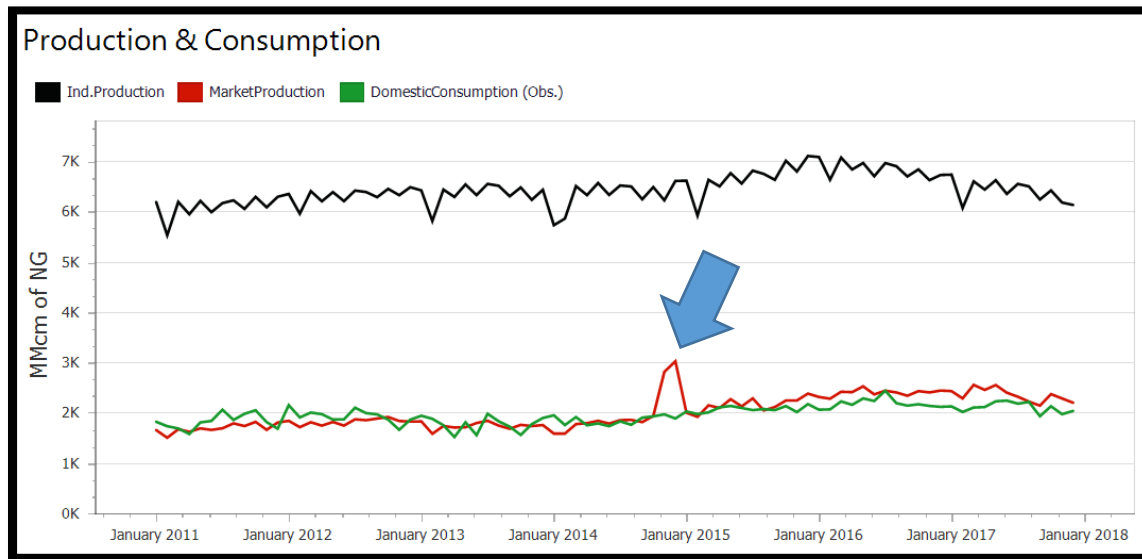
DEC system highlighted that in April 2017 a country’s production, exports and consumption in power sector decreased by around 25% M-o-M basis!, and its Pipeline exports increased by 55% in October 2017.

Let us check!

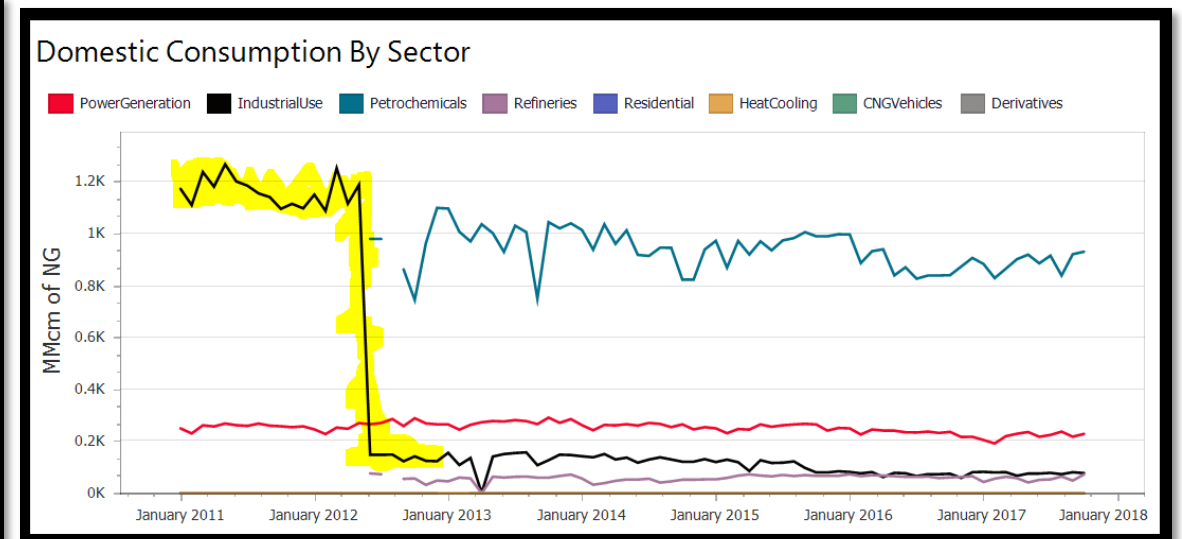
Data Validation Process, Techniques and Tools

Time Series / Visual Checks

- Monthly Changes



(1) The production increased by 50% in two points only with no justifications in the data.



(2) Gas consumption in industrial sector dropped by around 80% and stayed stable!

During general visual check, you can pick up quality issues like these!

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Participation Assessment

Sustainability

GECF DEM: Monthly Questionnaire (MQs) Sustainability*

Year	Algeria	Bolivia	Egypt	Eq. Guinea	Iran	Libya	Nigeria	Oman	Qatar	Russia	Trinidad and Tobago	United Arab Emirates	Venezuela	Grand Total
2011	0	12	12	0	12	0	0	12	0	0	12	0	12	72
2012	0	12	12	6	12	12	0	12	0	0	12	0	12	90
2013	0	12	12	12	12	12	0	12	11	0	12	0	12	107
2014	12	12	12	6	12	12	0	12	12	0	12	0	12	114
2015	12	12	12	12	12	12	12	5	4	0	12	12	12	129
2016	12	12	12	12	12	3	12	0	5	12	12	12	12	128
2017	12	12	12	12	12	0	12	0	12	12	12	1	12	121
2018	12	1	12	12	7	0	12	0	11	12	12	0	12	103
2019	3	0	3	4	0	0	2	0	3	0	0	0	0	15
Grand Total	63	85	99	76	91	51	50	53	58	36	96	25	96	879

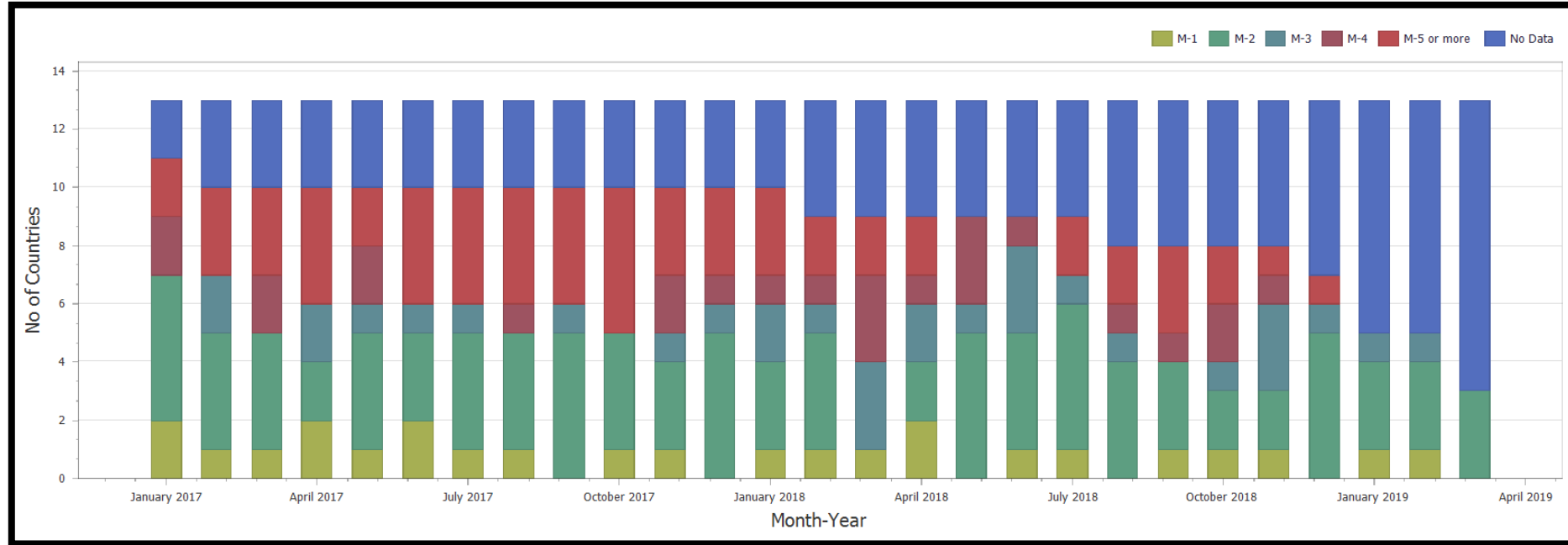
Red	<= 25% of the expected questionnaires
Yellow	> 25% & < 75 % of the expected questionnaires
Green	> 75% of the expected questionnaires

Data Gaps:

- Algeria and Nigeria joined Data Reporting Mechanism in 2014 and 2015
- Oman changed to Observer Status so there is no obligation for them to share the data
- Changing the Focal Point affected some active countries like Bolivia

Participation Assessment

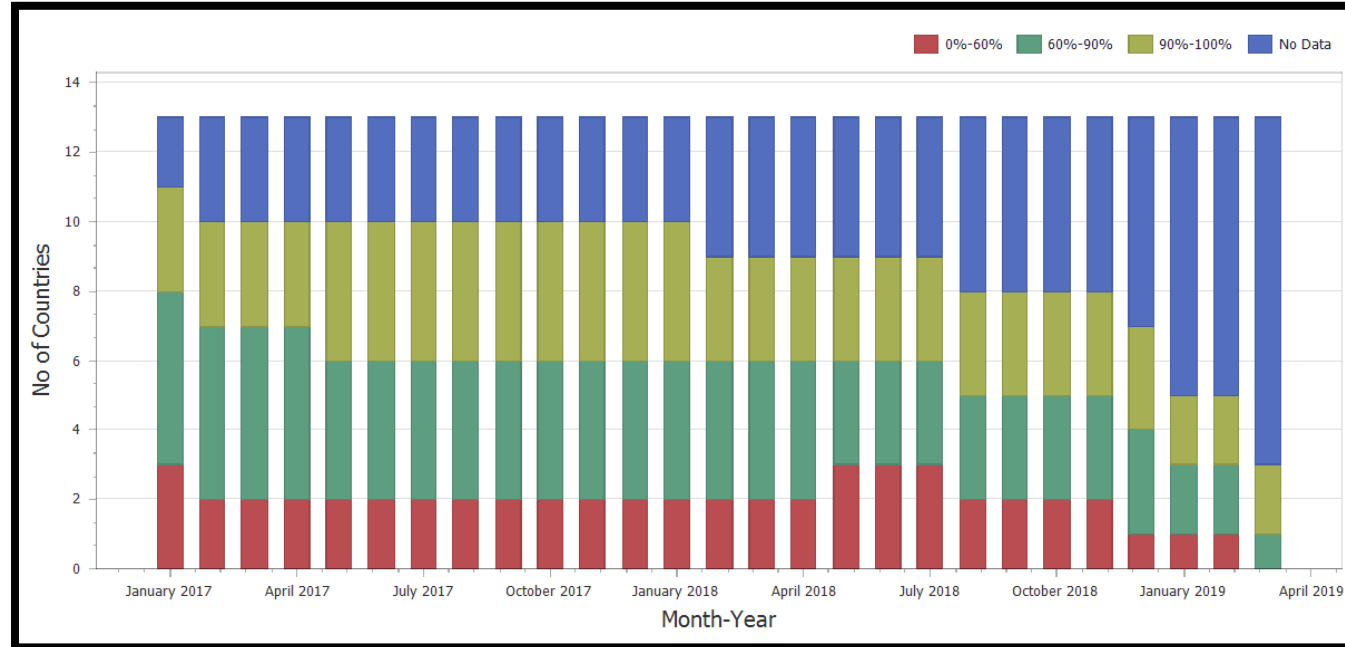
Timeliness



Green: Acceptable | Red: Delayed | Blue: No data received yet.

Participation Assessment

Completeness



Green: > 60% | Red: < 60% | Blue: No data received yet.

Participation Assessment

Smiley Faces

Country	Sustainability	Timeliness	Completeness (%)	Sustainability	Timeliness	Completeness (%)
Algeria	6	0	77%	😊	😞	😊
Bolivia	0	0	0%	😞	😞	😞
Egypt	6	5	77%	😊	😞	😊
Eq. Guinea	6	0	77%	😊	😞	😊
Iran	1	0	77%	😞	😞	😊
Libya	0	0	0%	😞	😞	😞
Nigeria	6	4	70%	😊	😞	😊
Oman	0	0	0%	😞	😞	😞
Qatar	5	5	45%	😊	😞	😞
Russia	6	0	45%	😊	😞	😞
Trinidad and Tobago	6	2	90%	😊	😞	😊
United Arab Emirates	0	0	0%	😞	😞	😞
Venezuela	6	0	70%	😊	😞	😊

From July to Dec 2018

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Consistency with Other Data Sources

Data Sources

The screenshot shows a web-based data management interface. On the left is a navigation menu with a tree structure. The main content area is titled 'Natural Gas Annual' and displays a table of data sources. The table has columns for 'Info Source Name', 'Info_Source_Service_Name', and 'Indicator'. The data rows are:

Info Source Name	Info_Source_Service_Name	Indicator
EIA (Count=7,738)		
GECF (Count=1,899)		

At the bottom of the table, it says 'Page 1 of 1 (3 items)' with a page number '1' highlighted in a yellow box.

Gas Annual Data

- GECF ASB: a primary source of annual data for GECF Member Countries
- EIA: International Energy Data
- BP Statistical Review
- IEA Natural Gas Information
- Others

Renewables

- IRENA Installed Capacity & Electricity Generation

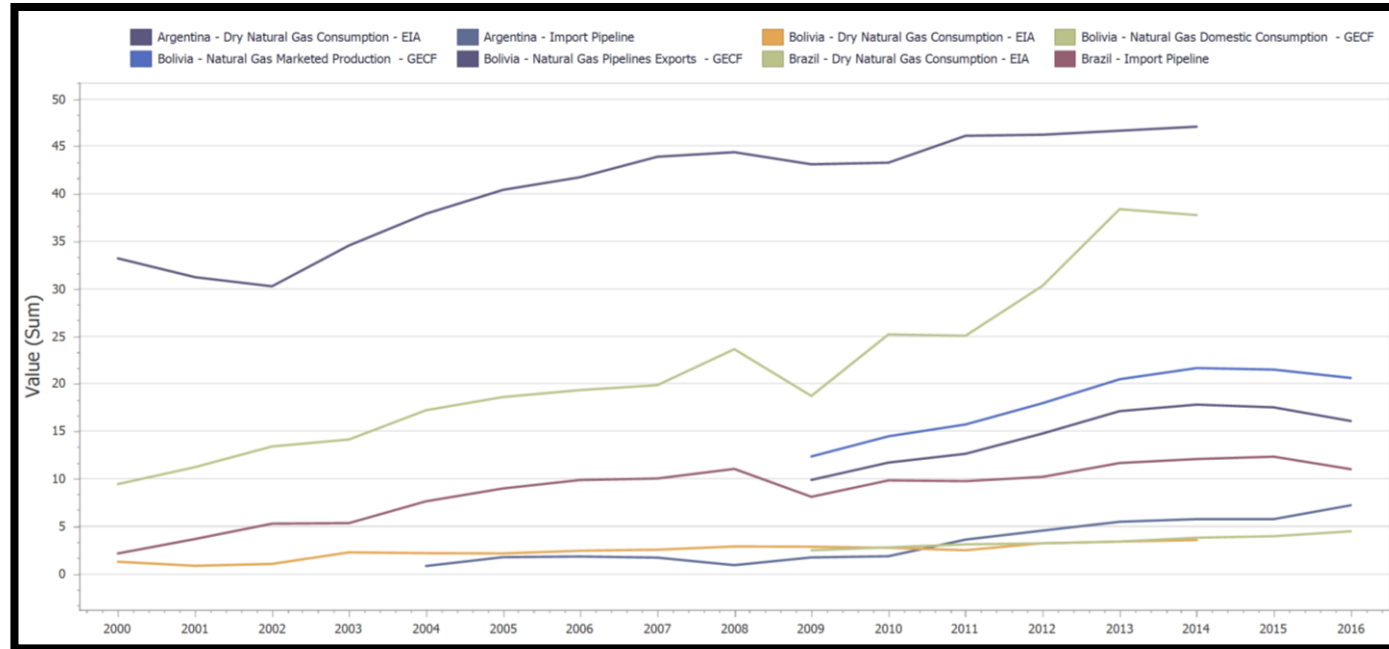
Macroeconomics

- World Bank WDI Indicators

More sources, in progress...

Consistency with Other Data Sources

Data Integration



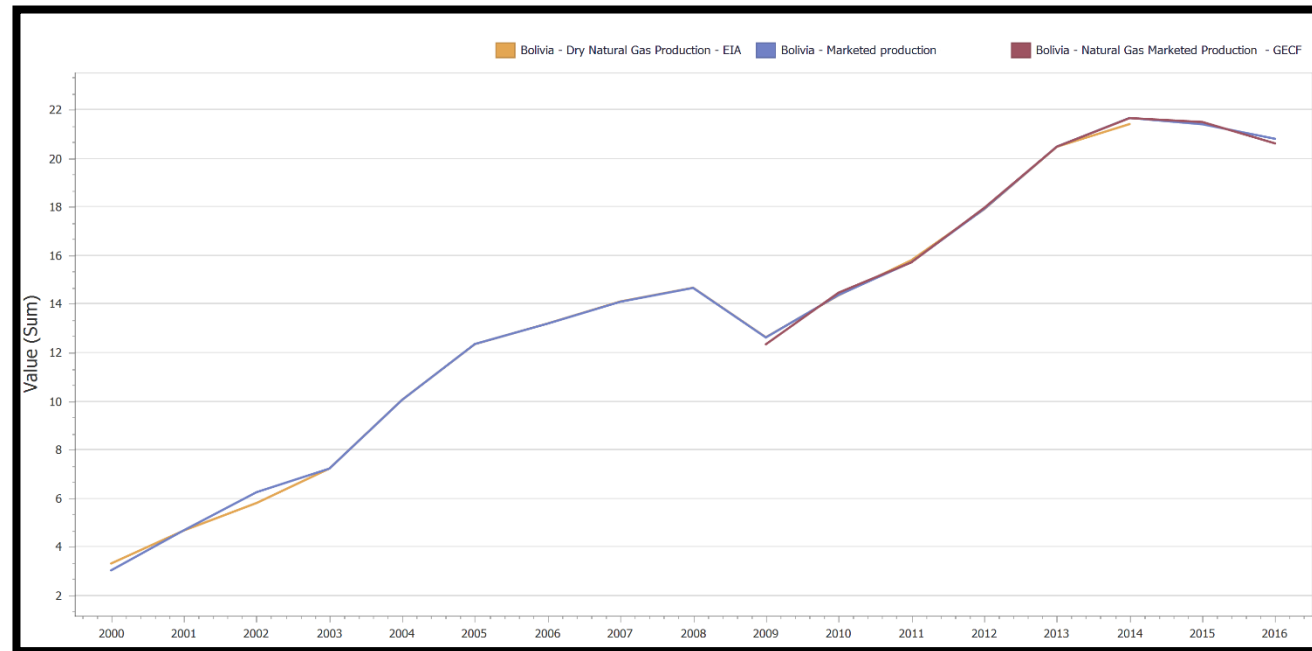
Brazilian gas consumption increase 2011 to 2014 . It was 37.8 Bcm.

In 2014, pipeline gas imports for Brazil = 12.1 Bcm, Argentina = 5.74 Bcm. The pipeline exports of Bolivia = 17.8.

Data for 3 Countries, from 3 sources in one chart!

Consistency with Other Data Sources

Benchmarking



When integrating data from different sources, bench marking figures is a recommended practice. A perfect match of Bolivian Marketed Production / Dry Natural Gas Production in three different sources.

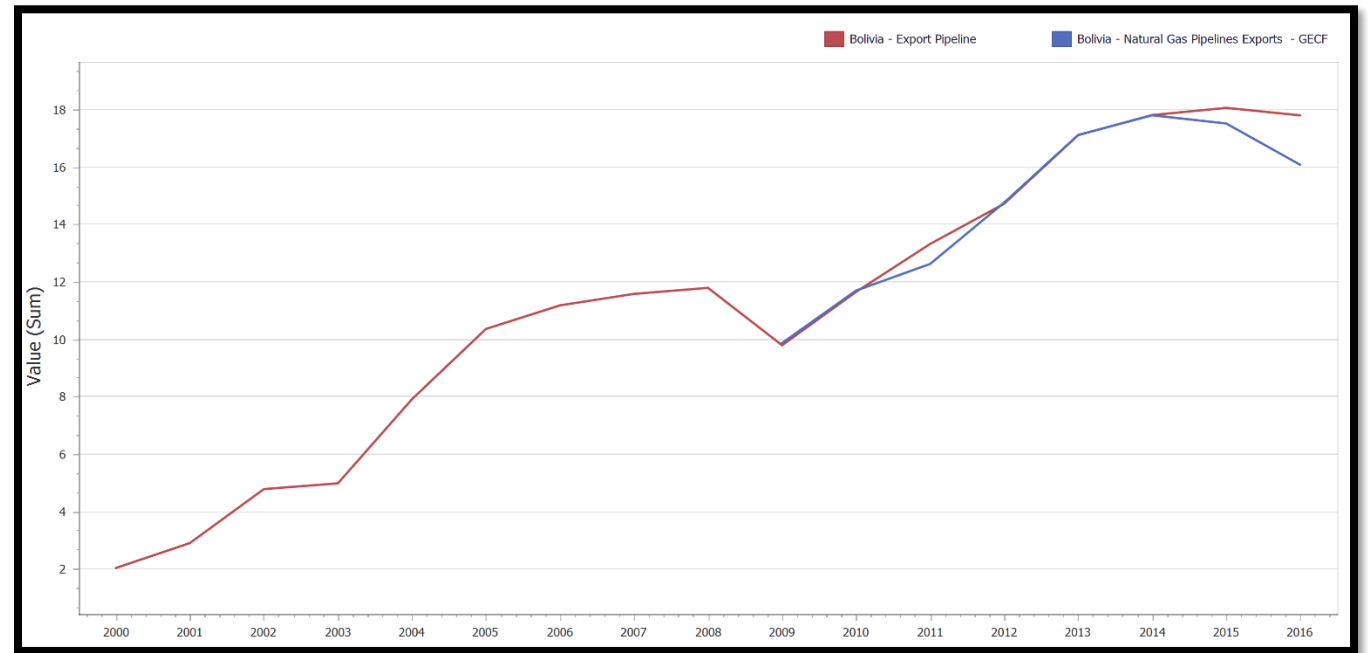
Data for 3 Countries, from 3 sources in one chart!

Consistency with Other Data Sources

Benchmarking

- **Bolivian Exports**

- Export figures of 2015 & 2016 among GECF and a second source are not matching!
- 1.7 Bcm difference in 2016. Which may be the reason of the decline of exports in the integrated chart?
- We have full trust in GECF primary data, some times secondary sources do data estimates.



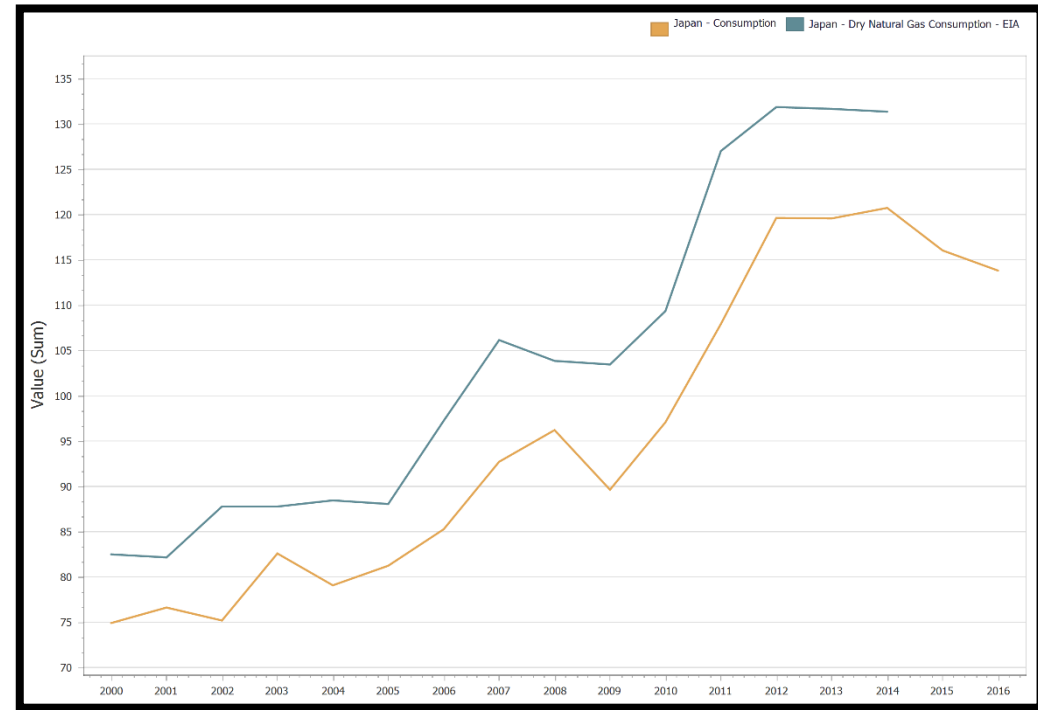
			2014	2015	2016
Bolivia	Export Pipeline	Other Source	17.8	18.1	17.8
Bolivia	Natural Gas Pipelines Exports	GECF	17.8	17.5	16.1

Consistency with Other Data Sources

Benchmarking

- **Japan Gas Consumption**

- The Japan Consumption figures of EIA and a second source are not matching!
- Is it definitions mismatch? May be some sectors are not included in second source?
- DISD team is continuously doing such data analysis to support its users.



			2011	2012	2013	2014
Japan	Consumption	Other Source	108	120	120	121
Japan	Dry Natural Gas Consumption	EIA	127	132	132	131

Questions?



Gas defines GECF. Data leads the way

Thank You!

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