Agenda

1. GECF Data Exchange Mechanism within JODI
2. Data Validation Process Techniques and Tools
3. Consistency with other Data Sources
4. Data Quality Assessment Indicators
5. Participation Assessment (Smiley Faces) Approach
6. Data Transparency within GECF
Data Exchange Mechanism is the main instrument that ensures collaboration and cooperation among GECF Member Countries. It defines the Data to be shared and exchanged, builds official channels of communication and leads to Data coordination, circulation and dissemination. Data Collection through Questionnaires (monthly and annual), defined and approved by SEDAS.
1. GECF Data Reporting Mechanism within JODI

JODI Questionnaire

Data Flows Definitions

GECF Data Exchange Mechanism

Metadata

The JODI-Gas World Database takes data from the GECF. A detailed colour code assessment approach by GECF is available at: www.jodidata.org/gas/support/user-guide/assessments/colour-code-assessment-approach-by-gecf.aspx

Venezuela began data reporting as of January 2011.

Equatorial Guinea began data reporting as of January 2012.

Libya began data reporting as of January 2012.

Oman began data reporting as of January 2012.

Egypt began data reporting as of January 2011. Egypt stopped LNG exports as of June 2014 and began LNG imports as of April 2015. No Pipeline imports and Pipeline exports are unknown / not reported.

GECF is in a process of confirming data reporting units of some data points with Equatorial Guinea.

Iran reports data to GECF.

GECF is in a process of confirming November and December 2014 production figures with Venezuela.

GECF received the JODI-Gas data in million cubic meters (at 15°C, 760 mm hg) for Natural Gas and “MT of LNG” for Liquid Natural Gas. Data is reported only in volume units not energy units (i.e. Terajoules).

JODI-Gas participation assessment (Smiley face)

Outstanding data issues

Reporting

Organisation(s) to which the country reports and

Country specific notes

JODI-Gas participation assessment (Smiley face)

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Outstanding data issues

Reporting

Organisation(s) to which the country reports and

Country specific notes

Algeria began data reporting as of January 2014.
1.1. JODI Gas Questionnaire

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

The JODI Gas World Database

JODI-Gas World Database: 1st update on 21 February 2018 – Data up to December 2017

- 58 countries updated the database with the most recent December.
- This update does not include data from countries reported through the energy data catalogues.
- A beta version of a csv file in a new format is available at New csv file, will replace the old format by the Mid 2018.

Joint Organisation Data Initiative - Gas Questionnaire

<table>
<thead>
<tr>
<th>Country</th>
<th>Month</th>
<th>Year</th>
<th>Natural Gas in million m³ (at 15°C, 760 mm hg)</th>
<th>Natural Gas in Terajoules</th>
<th>Natural Gas (LNG) in 1000 metric tons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Production

Exports

Imports

LNG

Pipeline

Stock Change

Gross inland Deliveries (Calculated)

Statistical Difference (Calculated)

Gross inland Deliveries Observed

of which: Electricity and Heat Generation

Closing stocks

Mass to volume conversion factor of LNG (if you have specific figure)

m³/metric ton LNG

Conversion factor

---

JODI Gas World Database

Beyond 2023 Professional Browser - JODI Gas World

File Edit View Dimension Item Data Windows Help

<table>
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<tr>
<th>JODI Gas World</th>
<th></th>
<th></th>
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<td>5</td>
<td>2,181</td>
<td>2,181</td>
<td>2,181</td>
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<td>5</td>
<td>2,181</td>
<td>2,181</td>
<td>2,181</td>
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</tbody>
</table>

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Better Data Better Decisions
### 1.2. Data Flows 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.

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<table>
<thead>
<tr>
<th>JOINT ORGANISATION DATA INITIATIVE - GAS QUESTIONNAIRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>Production</td>
</tr>
<tr>
<td>Receipts from Other Sources</td>
</tr>
<tr>
<td>Imports</td>
</tr>
<tr>
<td>LNG</td>
</tr>
<tr>
<td>Pipeline</td>
</tr>
<tr>
<td>Exports</td>
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<tr>
<td>LNG</td>
</tr>
<tr>
<td>Pipeline</td>
</tr>
<tr>
<td>Stock Change</td>
</tr>
<tr>
<td>Gross Inland Deliveries (Calculated)</td>
</tr>
<tr>
<td>Statistical Difference (Calculated)</td>
</tr>
<tr>
<td>Gross Inland Deliveries Observed</td>
</tr>
<tr>
<td>of which: Electricity and Heat Generation</td>
</tr>
<tr>
<td>Closing stocks</td>
</tr>
</tbody>
</table>

Mass to volume conversion factor of LNG (if you have specific figure)

<table>
<thead>
<tr>
<th>m³/metric ton</th>
<th>LNG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion factor</td>
<td></td>
</tr>
</tbody>
</table>
1.3. GECF Data Exchange Center

GECF Data Exchange Mechanism

- Data Gathering/Collection (primary source)
- Data Management/Processing (tables and dashboards)
- GECF Monthly/Annual Questionnaires (Natural gas statistical data)
- Special Envoys for Data & Statistics
- Data & Information Services Department

GECF Databank
- 2011-2018 primary data
- +800 Questionnaires

Data Distribution Channels
- GECF DEC System
- GECF Mobile Application
- GECF Website
- GECF Members’ Corner
- Annual Statistical Bulletin
- Research
1.3. GECF Data Exchange Center (DEC)

- A centralized multi modular system that consists of a web-based integrated platform that manages GECF primary and secondary data through a wide range of databases, predefined and customized dashboards, and ensures exchange of data and statistics among GECF countries.

- Modules of DEC:
  GECF Data Bank (Primary data): Monthly and Annually Data Quality Assessment and Measurement indicators
  Dashboards Analysis
  Gas Annual Data-Annual Statistical Bulletin
  JODI World Gas Database
  Energy Database: Coal, Renewables, Power, etc.
  Gas Prices
  Energy Market News
1.3. Data Exchange Center DEC (Cont.)

- DEC is a data collection, analysis and reporting system accessible to all GECF countries.

DEC User can retrieve gas (and other energy) data, use system dashboards for analysis or quality check. Everything can be exported to Excel.
2. Data Validation Process, Techniques and Tools

- First level validation by SEDAS
- Embedded and analyzed through DEC tools
- Data Quality Check by GECF/DISD
2. Data Validation Process, Techniques and Tools (Cont.)

a. SEDAS First Level Validation
b. DEC system: Data Entry Validation Rules - Automated feedback
c. Data Quality Check
   – Time Series Trends
      Seasonal patterns
      Monthly variations and changes
   – Visual Check
   – Dashboards Analysis
   – Consistency with other sources
2.1. SEDAS First Level Validation

- All Member Countries’ Ministers were called to appoint Special Envoys.

- Data Collection through Questionnaires (monthly and annual), defined and approved by SEDAS.

- Data gathering/collection for each MC, Validation and transmission to GECF/DISD.
2.2. DEC system : Data Entry Validation Rules

Automated feedback
2.3. 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.
2.4. Time Series Visual Checks: Monthly Change

- 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!
2.5. Visual Checks

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

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

– Gas consumption in industrial sector dropped by around 80% and stayed stable!
2.6. Dashboard Analysis

- **Share of each country in GECF Production**

  Marketed Production (MMcm)

  ![Graph showing market production for different countries from January 2014 to January 2017.]

- **Country Comparison - Annual Gas Consumption in Power Sector**

  ![Graphs showing domestic consumption and power generation for Algeria, Bolivia, and Egypt from 2014 to 2016.]
3. Consistency with other Data Sources

- DEC allows access to a variety of energy data sources and let to benchmark a wide range of data flows.
- Benchmark of GECF Monthly Primary Data with Energy Data Secondary Sources.
3. Consistency with other Data Sources (Cont.)

- Differentiation in data flow definition that may create disparity in data variance generated from different secondary sources for some countries.

- Per unit of measurement (Bcm), the gap is estimated at 0.01
Irregularity of LNG exports in 2016.

- Volume equivalent to two cargoes had not been assessed by the secondary sources generating a gap difference of 30%.

- Measurement gap.
- Volumes measured at regasification plants vs. volumes converted using conversion factors from TM to Bcm.
4. Data Quality Assessment Indicators

- **Timeliness**: Questionnaire submission time (M-2, every 10th of the month)
- **Completeness**: Fill all applicable & available data-points in the questionnaires
- **Sustainability**: Continuous and predictable submission on MQ & AQ
- **DEC System**: System automatically generates statistics and charts of Sustainability, Timeliness and Completeness.
- **Assessment Code**
4.1. Timeliness

- **Green**: Acceptable
- **Red**: delayed
- **Blue**: No data received yet.
4.2. Completeness

**Green**: > 60%

**Red**: < 60%

**Blue**: No data received yet.
### 4.3. Sustainability

<table>
<thead>
<tr>
<th>Year</th>
<th>Algeria</th>
<th>Bolivia</th>
<th>Egypt</th>
<th>Eq. Guinea</th>
<th>Iran</th>
<th>Libya</th>
<th>Nigeria</th>
<th>Oman</th>
<th>Qatar</th>
<th>Russia</th>
<th>Trinidad and Tobago</th>
<th>United Arab Emirates</th>
<th>Venezuela</th>
<th>Grand Total</th>
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<td>0</td>
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<td>12</td>
<td>6</td>
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<td>92</td>
<td>25</td>
<td>90</td>
<td>832</td>
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</tbody>
</table>

**Legend:**
- **Red** <= 25% of the expected questionnaires
- **Yellow** > 25% & < 75% of the expected questionnaires
- **Green** > 75% of the expected questionnaires
5. Monthly Data Assessment: Smiley Faces

- From January to June 2018

<table>
<thead>
<tr>
<th>Country</th>
<th>Sustainability</th>
<th>Timeliness</th>
<th>Completeness (%)</th>
<th>Sustainability</th>
<th>Timeliness</th>
<th>Completeness (%)</th>
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<tbody>
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<td>Algeria</td>
<td>6</td>
<td>5</td>
<td>70%</td>
<td></td>
<td></td>
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<tr>
<td>Bolivia</td>
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<td>1</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>6</td>
<td>2</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eq. Guinea</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iran</td>
<td>2</td>
<td>1</td>
<td>70%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Libya</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td>6</td>
<td>4</td>
<td>70%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Oman</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>40%</td>
<td></td>
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</tr>
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<td>3</td>
<td>30%</td>
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<tr>
<td>Trinidad and Tobago</td>
<td>5</td>
<td>1</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>United Arab Emirates</td>
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<td>0</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td>4</td>
<td>1</td>
<td>100%</td>
<td></td>
<td></td>
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</tr>
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</table>
6. Data Transparency within GECF
6. Data Transparency within GECF

Regional Breakdown
As at end 2016

<table>
<thead>
<tr>
<th>Region</th>
<th>GECF Share</th>
<th>World Gas Proved Reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America</td>
<td>4%</td>
<td>88%</td>
</tr>
<tr>
<td>North America</td>
<td>6%</td>
<td>93%</td>
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<tr>
<td>Africa</td>
<td>7%</td>
<td>74%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>8%</td>
<td>86%</td>
</tr>
<tr>
<td>Europe and Eurasia</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Middle East</td>
<td>8%</td>
<td></td>
</tr>
</tbody>
</table>

Source: GECF Analyses
6. Data Transparency within GECF

Source: GECF ASB2017
6. Data Transparency within GECF

JODI Capacity Building
GECF Workshops, SEDAS ANNUAL MEETING and DEC workshop
Regional Workshops at country level (Trinidad and Tobago, Equatorial Guinea)
GECF Annual Statistical Bulletin (ASB)
GECF Global Gas Outlook 2040
GECF Monthly Short Term Gas Market Report
The Gas Lecture Series
GECF Website http://www.gecf.org
GECF Monthly Statistical Bulletin (MSB)
GECF Quarterly Statistical Bulletin (QSB)
Inter-organizations technical cooperation
Questions ?
Thanks for Your Attention!
Better Data – Better Decisions
JODI-Gas Data Quality Assessment

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