
Gasification Technologies Conference
Washington, DC, 29th October, 2014
Overview

• Introduction
• New user interface
• Updated evaluations
• Conclusions
Introduction

• First edition 1999
• 2013 Update
  – Total 747 projects, 1741 gasifiers, of which:
  – Active commercial operating and planned 234 projects, 618 gasifiers
  – 105 GW_{th} operating and 147 GW_{th} planned or under construction
What’s New in 2014 Database - Content

• Content
  – Total 862 projects, 2378 gasifiers, of which:
  – Active commercial operating and planned 272 projects, 686 gasifiers.
  – 116 GW$_{th}$ operating, 83 GW$_{th}$ under construction and 109 GW$_{th}$ planned.

• Main additions
  – Continued increase in Chinese coal-to-chemicals projects, particularly for SNG.
  – Additional biomass and waste plants (now shown separately).
  – Update status of existing entries.
Cooperation with Other Databases

• IEA Task 33 (biomass gasification)
  – Important focus on pilot and development plants.
  – Emphasis on projects based on biomass gasification.
    • Includes downstream processes such as bioSNG or bioFT.
    • GTC’s gasifier-based data will not show these as separate entries.
  – GTC has a cut-off at $1\text{MW}_{\text{th}}$. 
New Online User Interface - Map of Facilities
New Online User Interface - Map of Facilities
New Online User Interface - Selection

What is Gasification?

World Gasification Database
A directory of gasification facilities around the world.

You may enter or select values for the fields below, then click on "Search" to find the records that match your selection in the database.

Region:                  Country:                  Technology:                  
Product:                Year Start: (on/after)       
Feed Class:              
- Biomass
- Waste
- Coal
- Gas
- Pet coke
- Petroleum

Search  Clear Search
New Online User Interface - Datasheet

Polk County IGCC Project

Location:
City, State/Prov.: Mulberry, FL
Country: United States
Region: North America
Facility Name: Polk Power Station, Unit No. 1
Facility Type: Electric Utility
Facility Status: Operating

Facility Notes:

Key Gasifier Information

GasifierID: 37
No. of Gasifiers:
Op'/g/Sp/Total: 1/0/1
Gasifier Status: Operating
Start Date (MM/YY): Oct. / 1996
Application: Syngas for Power
Plant Owner: Tampa Electric Co.
Plant Owner Type: Utility
Plant Operator: Tampa Electric Co.

Plant Name: Polk County IGCC Project
Gas'n Tech: GE Gasification Technology

Vendor Contact:
Jerry Kassman
jerrold.kassman@ge.com
**Feed/Product Information**

<table>
<thead>
<tr>
<th>Feed/Category</th>
<th>Category</th>
<th>Classification</th>
<th>Capacity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Feed:</td>
<td></td>
<td>Solid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed 1:</td>
<td></td>
<td>Coal &amp; petcoke</td>
<td>2,200 mtd (max)</td>
<td></td>
</tr>
<tr>
<td>Feed 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed 3:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syngas Capacity:</td>
<td>3,300,000 Nm3/d</td>
<td>Source: Gasifier licensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syngas Output:</td>
<td>451 MWh</td>
<td>Source: Gasifier licensor data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eq. IGCC Cap., MWe:</td>
<td>246</td>
<td>Calc.: 246</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Other Information**

<table>
<thead>
<tr>
<th>O2 Supply:</th>
<th>Supplier: Air Products &amp; Chemicals, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syngas Cooler:</td>
<td>Supplier: MAN GHHAG</td>
</tr>
<tr>
<td>Gas Cleanup:</td>
<td>Supplier: Generic</td>
</tr>
<tr>
<td>Sulfur Removal:</td>
<td>Supplier: MECS</td>
</tr>
<tr>
<td>Gas Turbine:</td>
<td>Supplier: General Electric Co.</td>
</tr>
<tr>
<td>HRSG:</td>
<td>Supplier: Vogt/GE</td>
</tr>
</tbody>
</table>

**Main Product:**
- Category: Power
- Product 1:
  - Category: Electricity
  - Capacity: 230 MWe (net)
- Product 2:
  - Category:
  - Capacity:
- Product 3:
  - Category:
  - Capacity:

**Notes:**
Cumulative Capacity with Probable Increase

MW$_{th}$ Synthesis Gas

Planned (2019)
Construction (2016)
Operating (2014)

Source: GTC Database, 2014
Gasification by Region

Source: GTC Database, 2014
End Use Applications of Syngas

![Bar chart showing End Use Applications of Syngas]

- **Chemicals**: Planned (2019) - 140,000 MWth, Construction (2016) - 120,000 MWth, Operating (2014) - 100,000 MWth
- **Liquid fuels**: Planned (2019) - 80,000 MWth, Construction (2016) - 60,000 MWth, Operating (2014) - 40,000 MWth
- **Power**: Planned (2019) - 20,000 MWth, Construction (2016) - 10,000 MWth, Operating (2014) - 5,000 MWth
- **Gaseous fuels**: Planned (2019) - 120,000 MWth, Construction (2016) - 100,000 MWth, Operating (2014) - 80,000 MWth

Source: GTC Database, 2014
Number of Gasifiers by Primary Feedstocks

Source: GTC Database, 2014
Gasification by Technology

MW$_{th}$ Synthesis Gas

- **Planned (2019)**
- **Construction (2016)**
- **Operating (2014)**

**Source:** GTC Database, 2014
Numbers of Gasifiers by Technology

Source: GTC Database, 2014
## Top 10 Commercial Gasification Projects

<table>
<thead>
<tr>
<th>Plants</th>
<th>Location</th>
<th>Technology</th>
<th>Gasifiers</th>
<th>MWh Syngas</th>
<th>Start Year</th>
<th>Feedstocks/Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearl GTL</td>
<td>Qatar</td>
<td>Shell</td>
<td>18 + 0</td>
<td>10936</td>
<td>2011</td>
<td>Natural Gas / FT Liquids</td>
</tr>
<tr>
<td>Sinopec Changji SNG Plant</td>
<td>China</td>
<td>Unspecified</td>
<td>20 + 2</td>
<td>10000</td>
<td>2017*</td>
<td>Coal / SNG</td>
</tr>
<tr>
<td>Sinopec Urumqi SNG Plant</td>
<td>China</td>
<td>Unspecified</td>
<td>24 + 4</td>
<td>10000</td>
<td>2017*</td>
<td>Coal / SNG</td>
</tr>
<tr>
<td>Yinchuan CTL Plant</td>
<td>China</td>
<td>Siemens</td>
<td>22 + 2</td>
<td>9300</td>
<td>2016*</td>
<td>Coal / FT Liquids</td>
</tr>
<tr>
<td>Jamnagar Gasification Plant Phase I</td>
<td>India</td>
<td>E-Gas</td>
<td>10 + 0</td>
<td>8893</td>
<td>2015*</td>
<td>Petcoke / Electricity-SNG-CO-Acetic acid</td>
</tr>
<tr>
<td>CPI Yili SNG Phase II</td>
<td>China</td>
<td>Unspecified</td>
<td>20 + 2</td>
<td>7500</td>
<td>2016*</td>
<td>Coal / SNG</td>
</tr>
<tr>
<td>Huadian Changji SNG Plant</td>
<td>China</td>
<td>Unspecified</td>
<td>20 + 2</td>
<td>7500</td>
<td>2017*</td>
<td>Coal / SNG</td>
</tr>
<tr>
<td>Datang Ningxia SNG Plant</td>
<td>China</td>
<td>SEDIN</td>
<td>45 + 3</td>
<td>7125</td>
<td>2015*</td>
<td>Lignite / SNG</td>
</tr>
<tr>
<td>Sasol Synfuels West</td>
<td>South Africa</td>
<td>Lurgi FBDB</td>
<td>40 + 0</td>
<td>7048</td>
<td>1977</td>
<td>Subbit. coal / FT liquids</td>
</tr>
<tr>
<td>Sasol Synfuels East</td>
<td>South Africa</td>
<td>Lurgi FBDB</td>
<td>40 + 0</td>
<td>7048</td>
<td>1982</td>
<td>Subbit. coal / FT liquids</td>
</tr>
</tbody>
</table>

*Planned/under construction
## Top 10 Operating Gasification Projects

<table>
<thead>
<tr>
<th>Plants</th>
<th>Location</th>
<th>Technology</th>
<th>Gasifiers</th>
<th>MWth Syngas</th>
<th>Start year</th>
<th>Feedstocks/Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearl GTL</td>
<td>Qatar</td>
<td>Shell</td>
<td>18 + 0</td>
<td>10936</td>
<td>2011</td>
<td>Natural Gas / FT Liquids</td>
</tr>
<tr>
<td>Sasol Synfuels West</td>
<td>South Africa</td>
<td>Lurgi FBDB</td>
<td>40 + 0</td>
<td>7048</td>
<td>1977</td>
<td>Subbit. coal / FT Liquids</td>
</tr>
<tr>
<td>Sasol Synfuels East</td>
<td>South Africa</td>
<td>Lurgi FBDB</td>
<td>40 + 0</td>
<td>7048</td>
<td>1982</td>
<td>Subbit. coal / FT Liquids</td>
</tr>
<tr>
<td>Datang Duolun MTP Plant</td>
<td>China</td>
<td>Shell</td>
<td>3 + 0</td>
<td>3373</td>
<td>2011</td>
<td>Lignite / Methanol</td>
</tr>
<tr>
<td>Shenhua Ningxia Coal to Polypropylene II</td>
<td>China</td>
<td>SEDIN</td>
<td>14 + 2</td>
<td>2500</td>
<td>2014</td>
<td>Coal / Methanol-PP</td>
</tr>
<tr>
<td>Shenhua Ningxia Coal to Polypropylene I</td>
<td>China</td>
<td>Siemens</td>
<td>5 + 0</td>
<td>1912</td>
<td>2011</td>
<td>Coal / Methanol-PP</td>
</tr>
<tr>
<td>Great Plains Synfuels Plant</td>
<td>United States</td>
<td>Lurgi FBDB</td>
<td>12 + 2</td>
<td>1900</td>
<td>1984</td>
<td>Lignite / SNG</td>
</tr>
<tr>
<td>Shenhua Baotou Coal-to-Olefins Plant</td>
<td>China</td>
<td>GE</td>
<td>5 + 2</td>
<td>1750</td>
<td>2011</td>
<td>Coal / Methanol-Olefins</td>
</tr>
<tr>
<td>Hexigten SNG Plant</td>
<td>China</td>
<td>SEDIN</td>
<td>12 + 2</td>
<td>1670</td>
<td>2012</td>
<td>Coal / SNG</td>
</tr>
<tr>
<td>Rongxin Inner Mongolia Methanol Plant</td>
<td>China</td>
<td>ECUST</td>
<td>2 + 1</td>
<td>1400</td>
<td>2014</td>
<td>Coal / Methanol</td>
</tr>
</tbody>
</table>
Conclusions

• Trends similar to last year.
• Mega-plants contribute to rapid increase in gasification capacity.
• Main growth is in Chinese Coal-to-Chemical industry.
• Chinese SNG plants likely to dominate top 10 in a few years.
• Numbers of biomass and waste gasifiers is increasing steadily.
Acknowledgements

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• Technology licensors and plant owners and others for contribution of project data.

• Any additions/corrections are always welcome
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