Modular GTL
global solutions and projects
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3 proven and operational GTL processes today

World scale GTL
Gas monetization
300MMscf/d ++

Modular GTL
Oilfield access
<= 50MMscf/d
Conventional GTL vs. CompactGTL

Shell Pearl - Qatar
140,000 bbl/d GTL products
450 football fields

< 5,000 bbl/d
<< 1 football field
Why is this now possible?

Conventional Tubular steam Reformer / ATR

Conventional FT reactor e.g. slurry phase

10x increase in specific throughput

Compact SMR Reactor

Compact FT Reactor

CompactGTL reactors using brazed plate & fin construction
Mini-channel CompactGTL reactors

Brazed plate-fin reactor construction minimises metal content and weight

Complete set of GTL reactors despatched by air-freight to Brazil

Corrugated metallic catalyst inserts maximise active surface area per channel

Automated catalyst insertion and removal
Process overview

Gas treatment

- Pre-wash
- Mercury removal
- Heating
- Sulphur removal

Syngas production

- SMR 1 reactor modules
- SMR 2 reactor modules
- Steam generation (WHB)
- Syngas compressor

FT synthesis

- FT cooling System
- FT 1 reactor modules
- FT 2 reactor modules

Gas feed

- Pre-reformer

Steam

Water treatment

No Oxygen Required!

High CO₂ Possible!

Product flash

HC rich tail-gas

GT drivers

H₂ rich tail-gas

Syncrude
25MMscf/d GTL integrated FPSO – SBM Offshore

- Fully integrated design
- 32,000 bbl/d crude production
- 2,000 bbl/d GTL liquids production

Image courtesy of SBM Offshore
50MMscfd onshore GTL plant

- Utilities and Water Treatment
- CompactGTL FT reactor modules
- CompactGTL SMR reactor modules
- NGL Recovery and Gas Clean-up
- Power Generation
- Air Compressors
- Fuel Gas Compressors
- Syngas Compression and Clean-up
- Utilities
- SMR reactor modules
- FT reactor modules
- NGL Recovery and Gas Clean-up
- Power Generation
- Air Compressors
- Fuel Gas Compressors
- Syngas Compression and Clean-up
- Utilities
- SMR reactor modules
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- Syngas Compression and Clean-up
Project delivery – exclusive partners

FEED stage
EPC stage

Offshore project

Qualified EPC Contractor
Onshore project

Johnson Matthey Catalysts
SPP
Kawasaki
Strong functional organisation

- CEO Nicholas Gay
  - Group Projects Co-ordinator
  - SHE & QA Administrator
  - QA & Data Control Administrator

- CTO Lary Kocher
  - Technology & Process Development Co-ordinator
  - Contracts Manager
  - Project Manager
  - Technology & Process Development Co-ordinator

- COO Simon Clark
  - Head of Operations
  - Brazil Operations Manager
  - Brazil Operations Team
  - Development & Commissioning Engineer

- Finance & Admin Manager Jane Bardell
  - Brazil Office Manager
  - Financial Controller
  - Accounting Assistant
  - IT
  - HR
  - Administration

- Strategic Analysis
  - Director of Business Development Iain Baxter
  - Proposals Manager
  - Contracts Manager
  - Business Development Manager

- Business Development
  - Business Development Manager
  - Catalyst Development Manager
  - Senior Scientist
  - Catalytic Process Scientist
  - Graduate/Junior Chemical Engineer

- Technology & Process Development
  - Contracts Manager
  - Project Manager
  - Mechanical Engineer

- Projects
  - Project Manager – Reactors
  - Principal Electrical/Control & Automation Engineer

- Operations
  - Project Manager
  - Development & Commissioning Engineer
  - UK Operations Manager
  - UK Operations Engineers, Operators and Administration

- Business Development
  - Business Development Manager
  - Proposals Manager
  - Contracts Manager

- Operations
  - Head of Operations
  - Brazil Operations Team
  - Brazil Operations Manager

- IT
  - Accounting Assistant
  - IT

- HR
  - HR

- Administration
  - Administration

- Finance & Admin
  - Finance & Admin Manager
  - Accounting Assistant
  - IT
  - HR
  - Administration

- Strong functional organisation
### Project examples

<table>
<thead>
<tr>
<th>Client</th>
<th>Region</th>
<th>Feed gas rate</th>
<th>Project driver</th>
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<tbody>
<tr>
<td>IOC</td>
<td>MENA</td>
<td>50 MMscfd</td>
<td>Liberate crude production</td>
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<tr>
<td>NOC</td>
<td>Americas</td>
<td>25 MMscfd</td>
<td>EWT</td>
</tr>
<tr>
<td>NOC</td>
<td>Russia-CIS</td>
<td>10 MMscfd</td>
<td>Remote location</td>
</tr>
<tr>
<td>NOC</td>
<td>MENA</td>
<td>20 MMscfd</td>
<td>Liberate crude production</td>
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<tr>
<td>NOC</td>
<td>Russia-CIS</td>
<td>100 MMscfd</td>
<td>Remote location</td>
</tr>
<tr>
<td>IOC</td>
<td>Asia-Pacific</td>
<td>30 MMscfd</td>
<td>Eliminate flaring</td>
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</table>
A ‘Win-Win’ for IOCs, NOCs and Governments

**IOCs**
- Enhance production
- Unlock new discoveries
- Increase recoverable reserves
- Add gas reserves to balance sheet

**NOCs**
- Increase in PSC profit oil
- Greater tax revenues
- Environmental “Kudos”

**Governments**
- Preserve and utilise National natural resources
- Gain access to World Bank finance
Why CompactGTL?
Global interest - Americas

- Onshore North America and GOM
- Mexico and Central America
- Developed regulatory framework
- 53 oilfields

CGTL regional activity: 3 projects

- Onshore and Offshore South America, Atlantic and Pacific Ocean and Caribbean
- Developed regulatory framework
- 62 oilfields
Global interest - Middle East and Africa

- Onshore and offshore Indian and Atlantic Oceans and Arabian Sea
- Mixture of emerging and developed regulatory frameworks
- 245 oilfields

CGTL regional activity: 2 projects
Global interest - Russia and CIS

- Onshore and offshore Barents Sea, Caspian Sea
- Mixture of emerging and developed regulatory frameworks
- 352 oilfields

CGTL regional activity: 2 projects
Global interest - South Asia and Asia Pacific

- Onshore and offshore Indian Ocean, South China Sea, Pacific Ocean
- Developed regulatory framework
- 47 oilfields

CGTL regional activity: 1 project
FAQs

• What is the Company’s background? How did you get here?

• What skills and experience does CompactGTL have that enables you to deliver commercial plants?

• How committed are your supply chain partners and manufacturers?

• A GTL process is more than FT synthesis. Does CompactGTL have an entire GTL process?

• What 3rd party independent verification or review of your process exists? With whom may I speak?
History and Achievements

Lab Scale Development
- 12 Years rig operations & modelling
- Reactor & catalyst development
- Independent verification

2000 -

2008 -

2010 -

Present -

Client funded project studies
- GAZPROM onshore Russia
- Other IOC’s & NOC’s under NDA
- Plants @ 200bpd to 10,000bpd

Brazil Commercial Demonstration Plant
- 20 months operations
- Process approval by BR Dec 2011

UK Pilot Plant
- 4 years operations
- Reactor & catalyst manufacturer selection
- Now an operator training centre
Experience to deliver commercial projects

- 95 years managing multi $billion upstream projects
- 20 years world scale GTL commissioning
- 45 years world scale GTL plant design
- 125 years upstream experience
- 25 years world scale GTL operations
## Supply chain commitment

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<tr>
<th>Exclusive in field</th>
<th>Equity investor</th>
<th>Pre-investment in manufacturing capacity</th>
<th>Pre-invested 4 years work for conceptual FPSO design</th>
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Entire GTL process

3 Proven and operational GTL processes today

Modular SMR Reactor

Modular FT Reactor

61,000 hours SMR reactor & SMR catalyst in operation

52,000 hours FT reactor & FT catalyst in operation

www.compactgtl.com
Independent verification of our process

More than 4 parties have verified our technology, process, engineering and plant cost basis

Public endorsement by Petrobras in January 2012. World’s 1st and only small scale GTL process approved for commercial deployment.