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JEREH-PRIMUS GTL SOLUTION

Gas Monetization and Flare Solution using STG+™ Technology
Simple · Robust · Economical



WORLD CLASS TEAM WORLD CLASS GTL SOLUTION

ABOUT PRIMUS

A global leader in Gas-to-Liquids (GTL) technology, Primus Green Energy delivers solutions for gas monetization based on its STG+™ process. Primus was founded in 2001 and over the past 15 years it has developed a portfolio of leading small-scale GTL technology. Located in New Jersey, Primus' vertically integrated headquarters include facilities for design, engineering, operator training and remote operation, as well as R&D and catalyst development. Core to the business is the dedicated team, which represents more than 300 years of collective experience at leading energy and oil & gas firms. Primus is committed to continually developing new solutions and applications – as well as to advancing the existing systems – in order to meet customers' unique business needs.

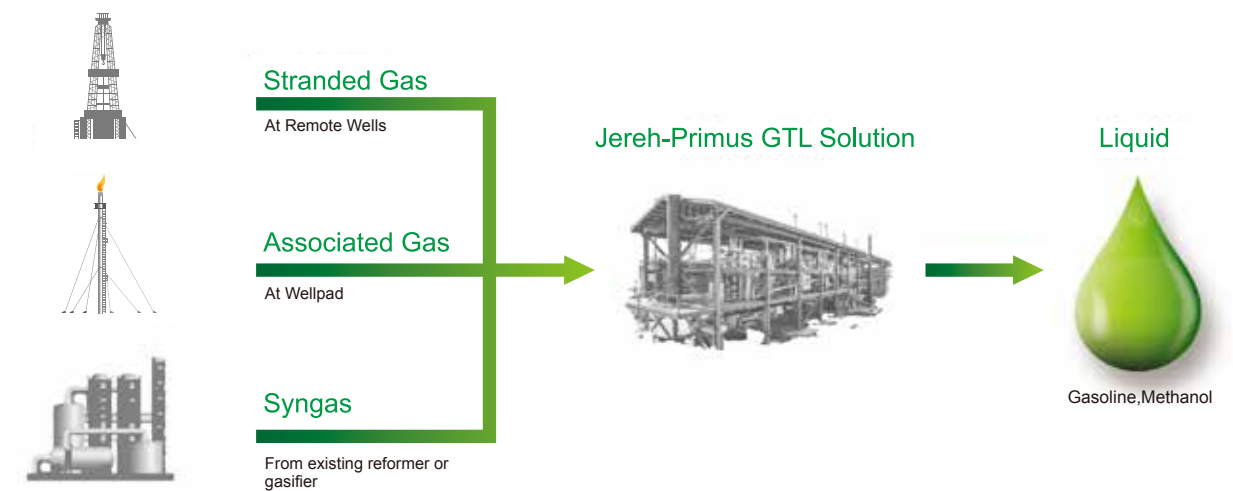
ABOUT JEREH

Jereh is an international, integrated oil and gas company specializing in oil and gas EPC services, oilfield technology services and equipment manufacturing. Through 15 years of development in the industry, Jereh has become China's largest privately-held listed oil and gas company. Today, Jereh's eight global R&D centers staffed with 1200+ professional engineers encourage technical innovations and strive for long-term leadership in the industry. Likewise, Jereh's eighteen international branches are established to work closely with customers in more than 60 countries to maximize the potential of every operation through reliable products and services.

GAS MONETIZATION CHALLENGES

1. Associated gas flaring wastes valuable resources and is a critical threat to the environment
2. Gas is stranded at the wellsite due to lack of pipeline infrastructure
3. Excess syngas from underutilized reformers and gasifiers

The Jereh-Primus team offers a range of flexible and robust GTL systems to meet the increased demand for gas monetization. Our advanced solutions are available on a single-vendor EPC basis for all scales.



The Jereh-Primus GTL solution is unmatched in the industry for simplicity and profitability thanks to its:

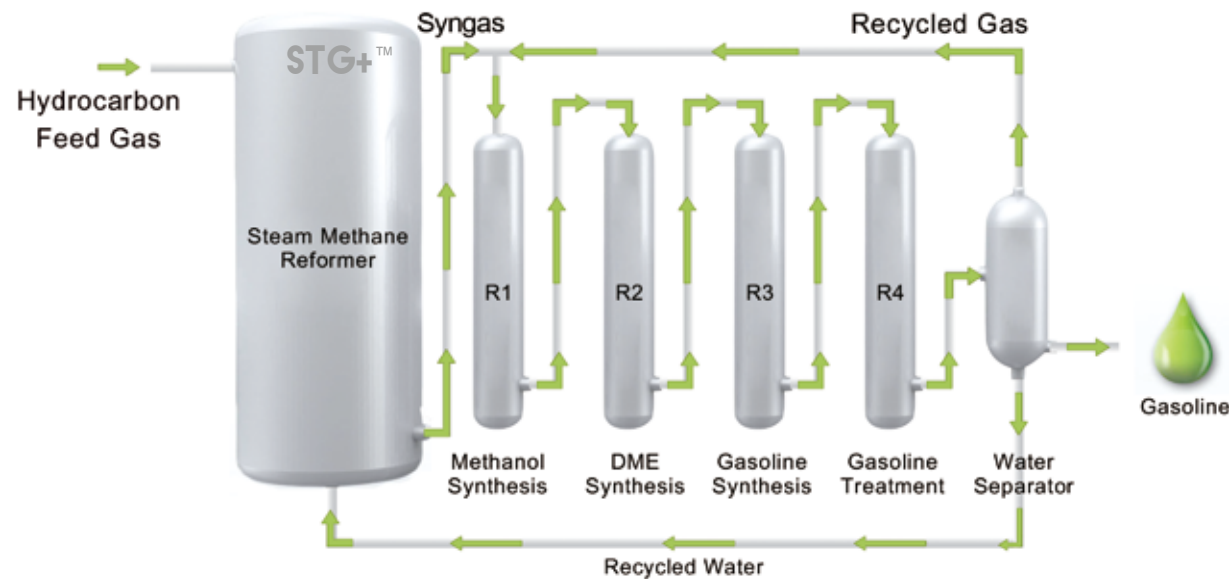
- Flexible feed gas requirements
- Proven GTL technology
- Modular design and fabrication
- Standard package for quick delivery
- Global sales, execution, and post-project support
- Integrated EPC solution

HOW THE STG+™ GASOLINE PROCESS WORKS

The Primus Gas-to-Liquids process takes place in a continuous gas-phase closed loop, with no intermediate condensation steps.

Gas-to-Gasoline STG+™ Process

- Steam Methane Reforming - Natural gas or other hydrocarbon gas reacts with steam at a high temperature and pressure to produce syngas (CO and H₂).
- Syngas-to-Gasoline - A series of catalytic fixed-bed reactors convert the syngas into gasoline and water via methanol and dimethyl-ether intermediates.
- Liquid/Gas Separation - The products are cooled and condensed. The gasoline product is sent to storage; the water is reused to make steam for the reformer; and the unconverted gas is recycled, with a portion being used to fuel the system.



HIGH QUALITY GASOLINE

| Property | STG+ Gasoline | Meets Spec * |
|--------------------------|---------------|--------------|
| Octane Number RON | 87-92 | P |
| Octane Number MON | 83-88 | P |
| RVP (psi) | 5-9 | P |
| E200 (vol %) | 50.0 | P |
| E300 (vol %) | 78.0 | P |
| Olefins (vol %) | 1.0 | P |
| Aromatics (vol %) | 24.0 | P |
| Benzene (vol %) | <<0.1 | P |
| Corrosion(D130) | 1a | P |
| Stability(minutes, D525) | >240 | P |
| Sulfur (ppmwt) | - | P |

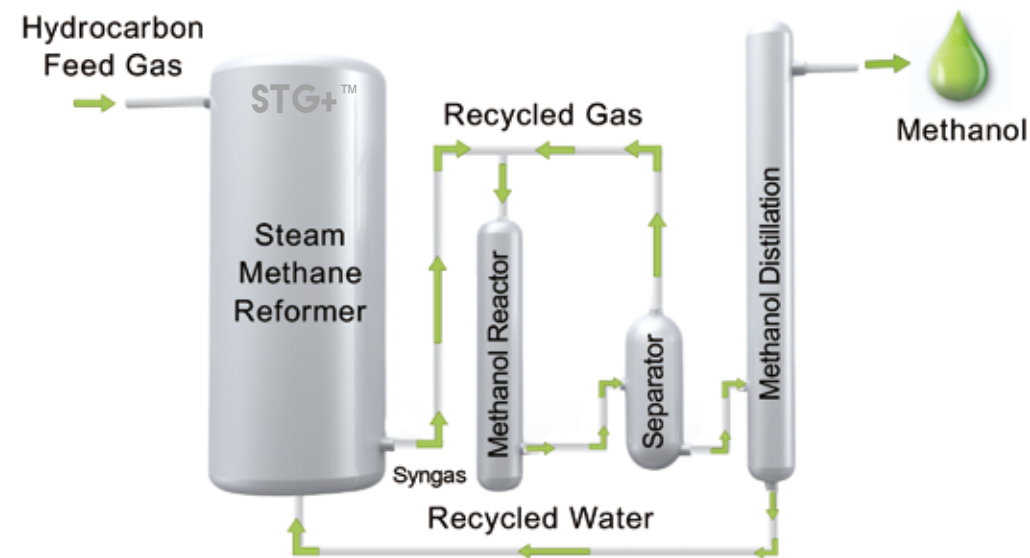
*Colonial Pipeline RBOB Specification

- High quality gasoline
- No refining needed
- Zero sulfur, zero benzene
- Gasoline meets standard specifications (RBOB, CBOB)

HOW THE STG+™ METHANOL PROCESS WORKS

Gas-to-Methanol STG+™ Process

- Steam Methane Reforming – Natural or other hydrocarbon gas reacts with steam at a high temperature and pressure to produce syngas (CO and H₂).
- Syngas to Methanol Reaction – Syngas reacts in a catalytic fixed bed reactor that converts the syngas to methanol.
- Distillation/ Separation – The water/methanol mixture is separated from other gases, and then fed to a distillation column system that is designed to meet the user's methanol purity requirements. On-spec methanol is collected from the top of the column, water is reused to make steam for the reformer and off-gas is recycled as feed or fuel to the reformer.



HIGH QUALITY METHANOL

| Property | IMPCA Methanol Spec | STG+ Methanol | Meets Spec |
|--|---------------------|---------------|------------|
| Purity (% WT dry basis) | ≥ 99.85 | ≥ 99.85 | P |
| Acetone (mg/kg) | ≤ 30 | ≤ 30 | P |
| Water (% W/W) | ≤ 0.1 | ≤ 0.1 | P |
| Specific Gravity (20°/20°) | 0.791-0.793 | 0.791-0.793 | P |
| Potassium Permanganate Time Test at 15°C (minutes) | ≥ 60 | ≥ 60 | P |
| Ethanol (mg/kg) | ≤ 50 | 0 | P |
| Chloride as Cl- (mg/kg) | ≤ 0.5 | 0 | P |
| Hydrocarbons (ASTM D1722-04) | pass | Pass | P |
| Carbonisable Substances (Pt-CO Scale) | ≤ 30 | ≤ 30 | P |
| Acidity as Acetic Acid (mg/kg) | ≤ 30 | ≤ 30 | P |
| Total Iron (mg/kg) | ≤ 0.1 | 0 | P |
| Non Volatile Matter (mg/1000 mL) | ≤ 8 | 0 | P |
| Sulfur (mg/kg) | ≤ 0.5 | 0 | P |

Methanol meets standard specifications

REQUIREMENTS FOR STG+™ FEED GAS

- Wide range of feed gas types are possible with no need for composition adjustment
- Sulfur < 20 ppm, no particulates
- Accepts dry or wet gas. No limits for C₂, C₃, C₄.
- Can utilize gas containing up to 25% CO₂ and 5% N₂
- No specific requirements for pressure and temperature

STANDARD STG+™ GTL PLANT

| Feed Gas Type | Liquid Product | Feed Gas Flow MMSCFD | Feed Gas Flow NM ³ /D | Production Capacity |
|---------------|----------------|----------------------|----------------------------------|---------------------|
| Natural Gas | Gasoline | 4-5 | 110,000-130,000 | 500 bpd |
| Natural Gas | Gasoline | 17-20 | 450,000-540,000 | 2000 bpd |
| Syngas | Gasoline | 17-20 | 450,000-540,000 | 500 bpd |
| Syngas | Gasoline | 68-80 | 1.8-2.1 million | 2000 bpd |
| Natural Gas | Methanol | 4-5 | 110,000-130,000 | 160 mt/d |
| Natural Gas | Methanol | 17-20 | 450,000-540,000 | 640 mt/d |

STANDARD STG+™ GTL PLANT



SMALL SCALE, MODULAR DESIGN

BEST IN CLASS GTL SOLUTION

Compared to other GTL technologies, our STG+™ solution has the following advantages:

- ✔ Low cost modular design
- ✔ Cost effective at gas flows as small as 4 MMSCFD (100,000 Nm³/d)
- ✔ Single finished product stream
- ✔ 100% standard components
- ✔ Long catalyst lifetime
- ✔ Gasoline meets standard specifications, no refining
- ✔ Accepts variety of feed gas types (wellhead, pipeline, wet, dry,...)
- ✔ Incorporates syngas directly from steam methane reformer, no shift reactor is needed
- ✔ No gas pretreatment needed
- ✔ No product post-treatment needed
- ✔ No wastewater or other waste streams
- ✔ No intermediate condensation steps - Entire process takes place in a gas-phase continuous loop



PROJECT SUPPORT AT EVERY STAGE

Our team works with you to develop GTL project solutions. We offer:

- Feasibility studies/ site selection support
- Process Design Package (PDP)
- Front End Engineering Design (FEED)
- Detailed Engineering Design Package
- Procurement
- Construction
- Erection of Plant
- Training
- Commissioning
- Start-up
- Project Management
- Quality Guarantee



JEREH-PRIMUS OFFERS COMPLETE LUMP SUM EPC SOLUTIONS

Engineering & Technology

- R&D and demo plant with long term post-project support
- World class engineering from US and China offices
- Latest engineering software
- Design to various international standards

Project Management

- Single point responsibility for complex projects
- Dedicated project team through life of project
- Strong scheduling and cost control
- Liaise with all stake holders for maximum positive impact

Modular System

- Skids fabricated and tested at central location
- Easy assembly at site for aggressive schedules
- Easily deployed to remote locations



From project proposal, designing, procurement to construction, commissioning, start-up and final delivery, at any stage, we strictly comply with the industry standards, committed to providing customers with safety, efficiency and reliability.



Procurement

- In-house production and quality control on catalysts
- Global sourcing to ensure most competitive project solution
- Logistics: Ensure best solutions for fast, safe delivery
- New vendor approval system
- Independent inspection and quality control
- Integrated software for efficient office and on-site procurement

Construction & Erection

- Meet each customer's specific needs
- Contracts with local service providers
- Overall responsibility for construction and erection
- Provide technical support and site audit

Training, Commissioning & Startup

- Training at GTL demo plant in New Jersey, USA
- Classroom and on-site training
- Technical leadership during plant commissioning and startup
- Stabilize the plant to reach commercial production

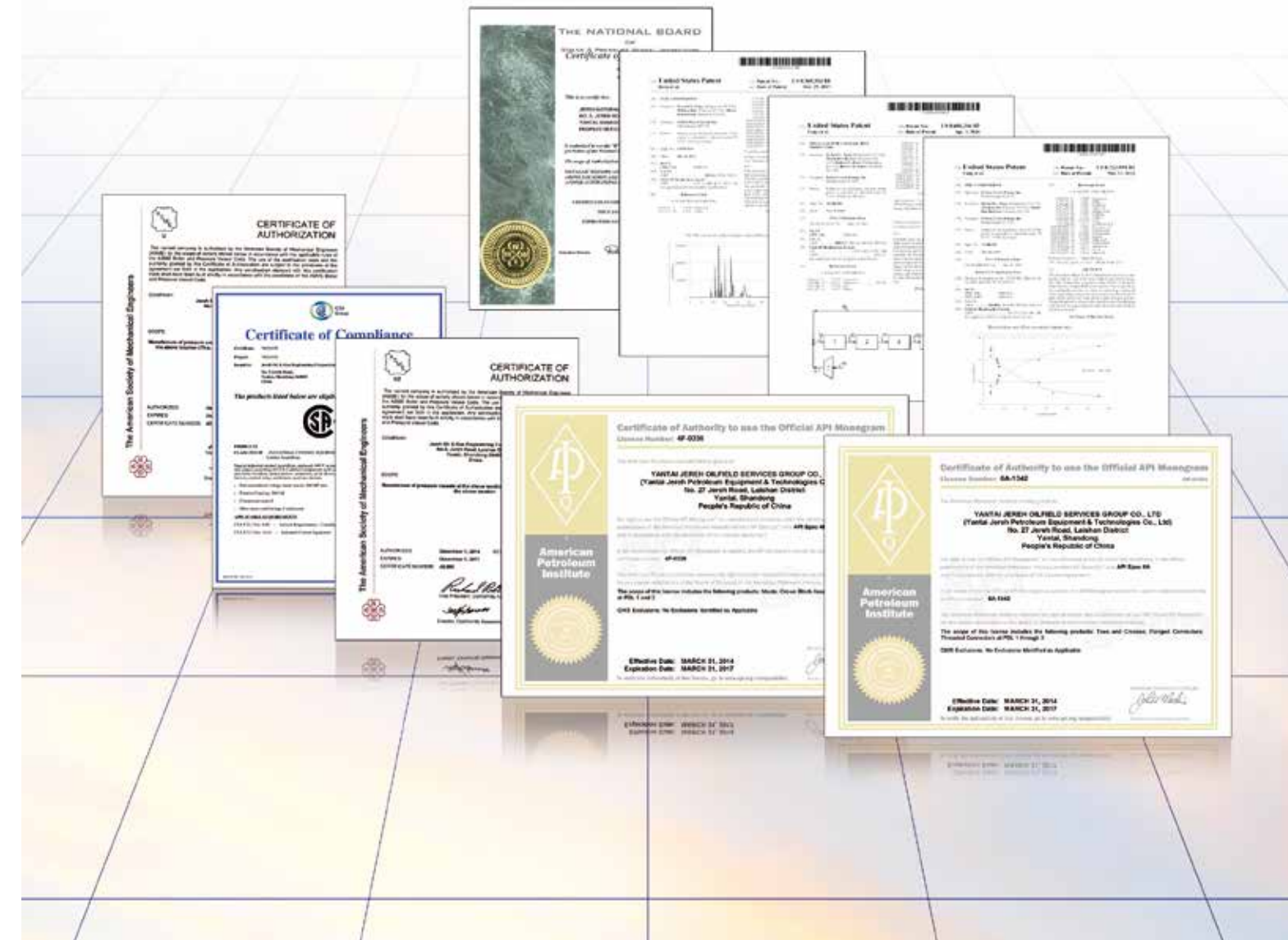
THE LEADING CHOICE FOR GAS MONETIZATION

Why Choose The Jereh-Primus Solution?

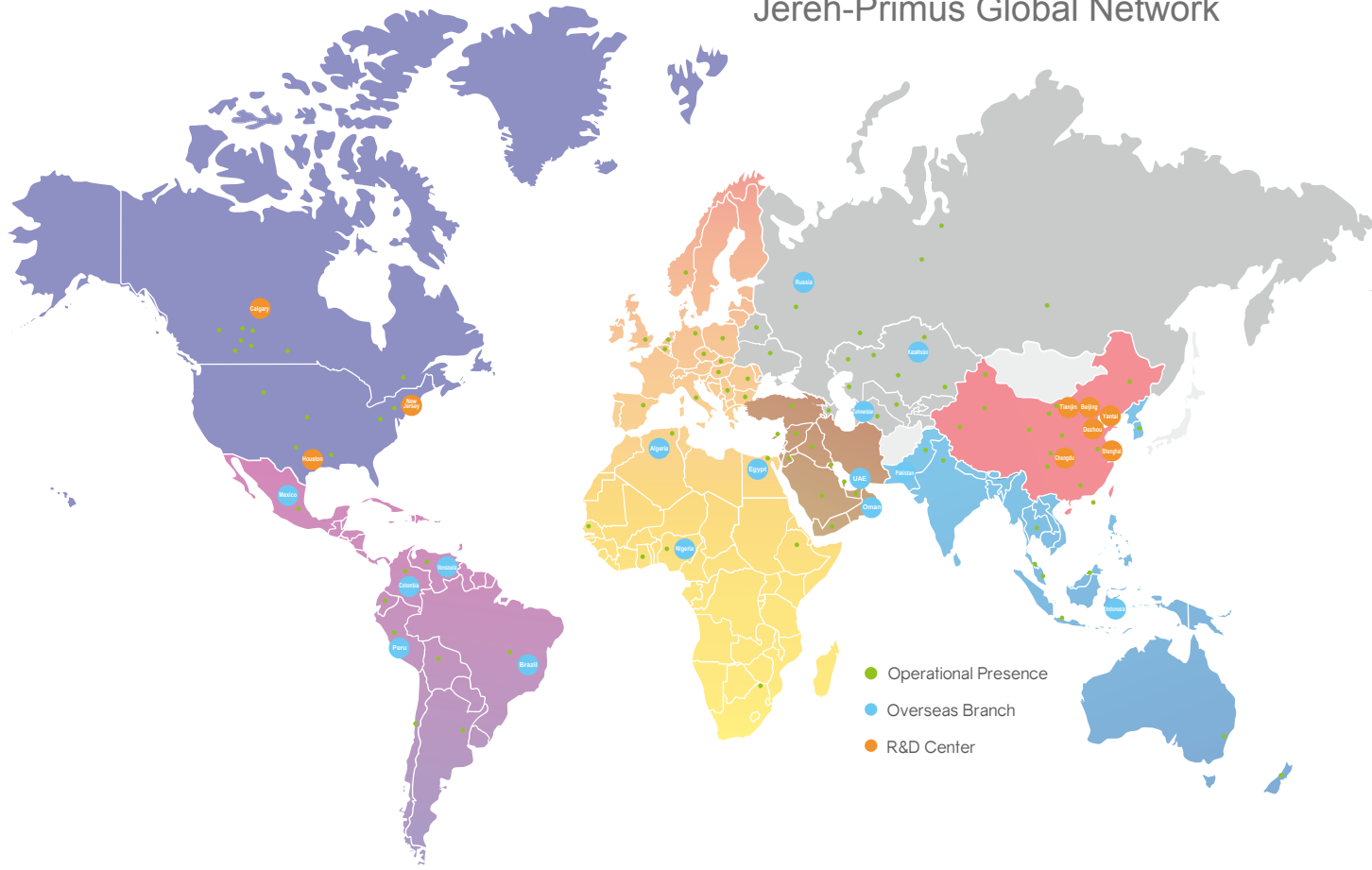
- Single vendor solution to client on an EPC basis
- Best in class Gas-to-Liquids technology
- Strong presence in O&G industry
- Guaranteed delivery and performance gives peace of mind to client
- Global network for sales, delivery, installation, commissioning, startup, and post-project support
- Pre-engineered, modular plants fabricated offsite enable rapid delivery and short construction time
- World-class fabrication, engineering, and project delivery capabilities



QUALIFICATIONS & PATENTS



Jereh-Primus Global Network



- Operational Presence
- Overseas Branch
- R&D Center

- North America
- Europe & Africa
- Russia & Central Asia
- China
- Latin America
- Middle East
- Asia Pacific

