



Bechtel Energy Technologies & Solutions  
Building a better world  
with technology



## Gas Processing Technology

IPSI Enhanced NGL Recovery<sup>SM</sup>  
Improved Propane Recovery  
High ethane recovery  
Immiscible Refrigeration System

## Sulfur Technology

Sulfur Recovery  
SWSPlus<sup>SM</sup>  
Pressure Swing Claus  
Gas Treating  
H<sub>2</sub>S Production

## Refining Technology

ThruPlus<sup>®</sup> Delayed Coking  
Group I/II Base Oils

## Startup Support

Precommissioning  
Commissioning

## Industry Leading Study Expertise

Gas Processing  
Refining  
Heavy Oil processing  
Petrochemicals / Chemicals  
Coal / Gas to liquids  
Biofuels

## PROVEN ECONOMIC PROCESSES



Safety



Reliable



Clean



Proven



Profitable

# Building a better world with technology

The world's best technical experts work at Bechtel. Bring the builders of the world's largest refinery, >30 LNG trains and nearly 100,000 km of pipelines to work for your project and see what thinking big means no matter how large or small your project is.



When planners at Reliance Industries decided to build the world's largest refinery in Jamnagar, India, they called Bechtel because they knew that they needed a contractor that delivered consistent, cost-effective high quality results in a manner that met their demanding schedule. That schedule was met with the successful 2008 startup of the 1.2 million barrel per day refinery. Bechtel later completed the expansion of the 600,000 barrels per day Motiva Port Arthur Refinery in Texas, creating the largest refinery in the USA. Together those refineries make up 2.0% of the world's annual oil consumption.

Likewise, in 1967 when Great Canadian Oil Sands wanted to develop a new, novel processing facility that turned oil sands into crude oil, they turned to Bechtel. Bechtel later completed the Syncrude oil processing facility in 1978 and set the stage for Canada becoming one of the world's largest sources of oil reserves.

And those are just a few of our numerous projects in the refining, gas processing and petrochemicals industries.

**One of the most important principles in any successful project is beginning with the end in mind.** It's that philosophy that created Bechtel Energy Technologies & Solutions (BETS). Bechtel brought together the world's leading technologists, engineers and specialists and combined them with industry leading technologies to create an organization that can take your project from concept to reality no matter how small or large.

And this is a part of our heritage and our future. As Stephen Bechtel once said "We'll build anything for anybody, no matter what the location, type or size." Come see what is possible and you will realize why **building a better world with technology starts with us.**



Motiva Port Arthur Expansion TX, USA



# Study Services

Annually, the United States produces 69 quadrillion Btu of Petroleum, Natural Gas and Renewable Energy<sup>1</sup>. That's equivalent to supplying 253 million Americans.

How can we harness this energy to power the world's growth in a way that is safe, sustainable and practical?

Whether you are an energy producer or consumer, BETS can help you make better strategy development or project implementation decisions

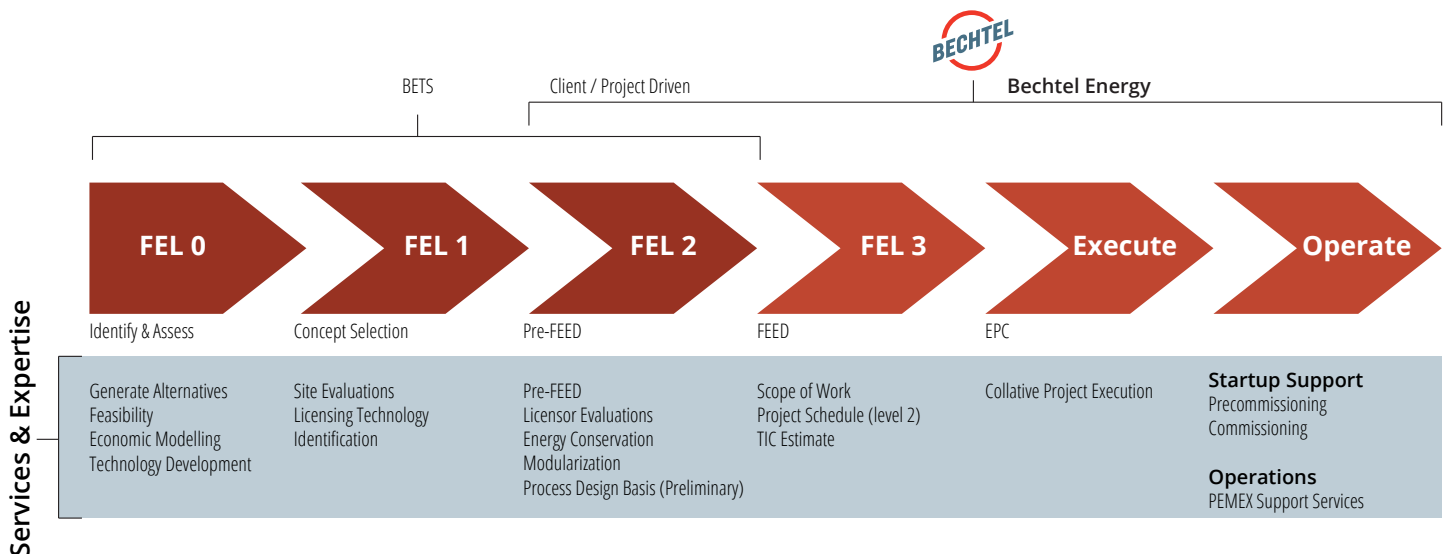
Our staff of technical specialists provides expertise in a wide range of process technologies, complemented by many years of operations experience.

Specialized services for energy industry clients include:

Our study services include:

- Process design and process technology
- Consulting and feasibility studies
- Techno-economic studies
- Technical audits
- Pre-commissioning, commissioning planning and support

- New technology development
- Value improvement practices
- De-bottlenecking studies
- Program management
- Technology licensor evaluations
- Energy conservation and optimization
- Pre-commissioning and commissioning assistance
- Technical audits
- Oil sands and unconventional oil studies





# Sulfur Technology

## Sulfur Recovery

SWSPPlus<sup>SM</sup>

## Pressure Swing Claus

## Gas Treating

## H<sub>2</sub>S Production

Bechtel Energy Technologies & Solutions (BETS) Sulfur Technology and Bechtel EPC services are used by the world's leading refineries and production facilities. Our combined experience encompasses over 50 Claus units and associated facilities totalling over 20,000 LTPD liquid sulfur.

To meet industry needs, BETS is actively engaged in technology development and is currently working to commercialize the following technologies:

### **Bechtel Pressure Swing Claus (BPSC)**

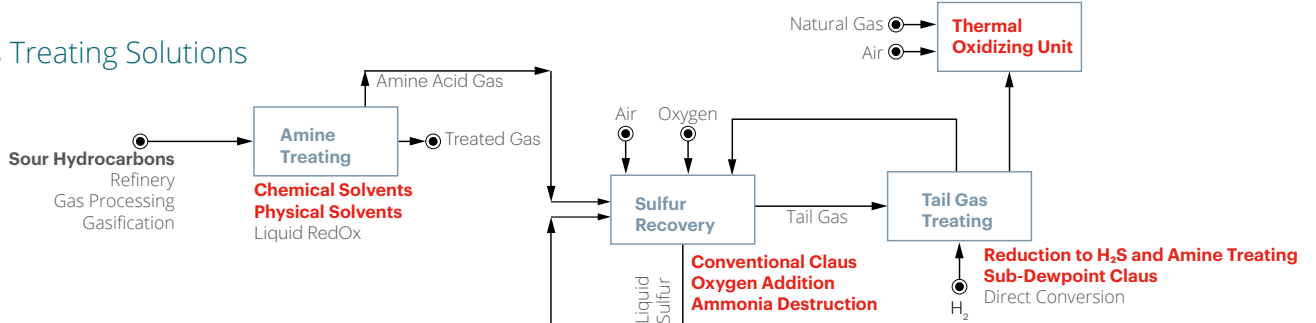
The Bechtel Pressure Swing Claus process can reduce plant capital and operating costs by 15-20% as it eliminates many of the typical processes associated with a sulfur complex.

### **Bechtel Sulfur Adsorbent Technology (BSAT)**

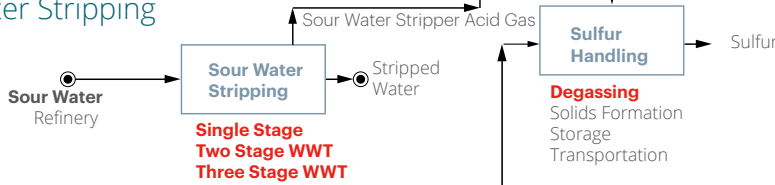
The Bechtel Sulfur Adsorbent Technology addresses industry challenges with elemental sulfur deposition in pipelines or processing units by completely removing the elemental sulfur with no loss of production.

**Licensed Technologies**  
Core Competencies

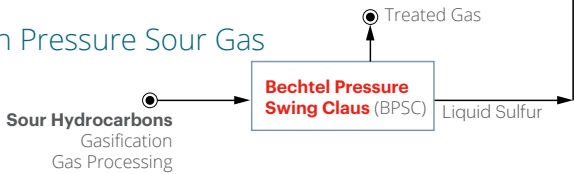
Gas Treating Solutions



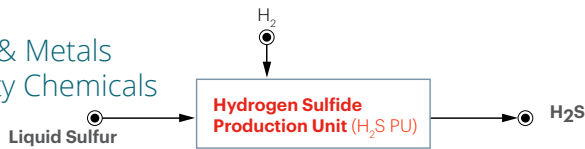
Sour Water Stripping



High Pressure Sour Gas



Mining & Metals  
Specialty Chemicals



Pipelines



Flue Gas SOX Removal

Fluidized Bed Combustion  
Wet Limestone  
SO2-CO2 Removal system

Special Services

Studies  
Troubleshooting  
Operator Training  
Technology Selection  
Start-up Assistance

Environmental Compliance

Regulatory Analysis  
Compliance plans  
Permitting



# Delivering Net Zero with Bechtel

## Helping customers accelerate their decarbonization goals

Our Bechtel Energy Technologies & Solutions (BETS) group provides technology and subject matter experts focused on delivering for our customers as they tackle the challenges of the Energy Transition. Bechtel delivers optimized solutions to help our customers realize lower capital costs, shorter times-to-market, and projects with lower carbon emissions.

Supported by world-renowned experts, our depth of technology experience and technology development capabilities, and a suite of in-house licensed technologies, we examine innovative solutions and identify the optimal solution for each customer's needs. We have the breadth and depth of expertise to evaluate and integrate proven technologies, emerging technologies, and innovative combinations of both to lower carbon emissions for our customers.

## How we help

We apply technology, economic analysis and complex process systems analysis to the energy transition challenge including concept definition, emerging technology advice and selection services, feasibility studies, technology licensing, process design basis and pre-front-end engineering and design (pre-FEED) services in olefins, chemicals, water treatment, advanced fuels, sulfur, carbon capture and hydrogen.

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