Suncor Denver Refinery Overview
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Randy Segato
→ Suncor History

→ Integration Projects
  ... Project Odyssey

→ Crude Qualities
  ... Suncor Synthetics
  ... Canadian Heavy
  ... Colorado Sweet
  ... other northern Padd2 and Padd4 crudes
2003

- Suncor acquires Conoco Philips Commerce City Refinery
- Nominal 60,000 bpd
- Formation of Suncor Energy USA (SEUSA)

Rick George, Suncor CEO

“Colorado is a growing, dynamic marketplace, and we're excited about expanding our business to this area. This acquisition provides us with the flexibility to move our products to the Denver refinery or other customers -- and gives us increased control of our product from production straight through to the consumer"
2004

- 300 M$ Planned Investment
- ULSD and integration to Oil Sands

“This Investment confirms Suncor's commitment to building our Denver operations as a key component of the company's long-term strategy.”

On completion of the project, Suncor said it expects to integrate 10,000 to 15,000 barrels per day of oil sands sour crude into the refinery, and also will increase the refinery's capacity to process bitumen used in asphalt production.
2005

• Suncor acquires Valero Refinery “across the street”

• Nominal 30,000 bpd

Colorado Petroleum Association

"This isn't the first time people have talked about putting those two refineries together. It makes all the sense in the world. Any refinery that's away from the coast, that's small and only capable of handling a particular type of crude oil, the economics of refining suggest that you have to get bigger and get a big supply of crude oil”

Valero's chairman and CEO

"These two plants belong together under one company because they are much stronger and have a much brighter future together than either has individually. In addition to Suncor providing employees with compensation and benefits programs comparable to ours, the integration of these operations will provide greater opportunities for growth and a brighter future."
Denver Refinery – nominal 90,000 bpd “Fuels” Refinery

**Key Process Units**
- Crude Units (3) - 2 Conventional / 1 High TAN capable
- FCCU (2)
- Poly (2)
- Reformer (2)
- Distillate Hydrotreating (2)
- High Sulfur High TAN Gasoil Hydrotreating (1)

**Production**
- LPG
- Gasoline (all grades, low octane ”regional”, ethanol blending)
- LSD/ULSD
- Jet
- Asphalt (PG grade capable)
To provide greater reliability and flexibility to our feedstock supplies, we produce bitumen through our own mining and in-situ recovery technologies, and supplement that supply through third party agreements.

We produce conventional natural gas as a price hedge against the cost of energy consumption.

Our investments in renewable wind energy and biofuels are a key part of Suncor’s climate change action plan.

Suncor takes an active role in connecting supply to consumer demand with a diverse portfolio of products, downstream assets and markets.

A staged approach to increasing our crude oil production capacity allows Suncor to better manage capital costs and incorporate new ideas and new technologies into our facilities.
The Suncor strategy

We produce natural gas as a natural price hedge against the cost of energy consumption at Suncor’s oil sands operation.

To provide greater reliability and flexibility to our feedstock supplies, we produce bitumen through mining and in-situ recovery technologies and supplement that supply through third party agreements.

A staged approach to increasing crude oil production capacity allows Suncor to better manage capital costs and incorporate new ideas and new technologies into our facilities.

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Our investments in renewable wind energy and biofuels are a key part of Suncor’s climate change action plan.

International and offshore assets are a source of steady cashflow to fund our oil sands growth.

Project Odyssey Investment

Commerce City Refinery Investment grows to 445 m$ ; Suncor's first major project at the refinery

→ Project Odyssey is the name of the $445 million upgrade to Suncor's Commerce City refinery—the largest refinery in the Rocky Mountain region. The investment marks the second largest capital project in the Denver area, after the city's transportation expansion called T-REX. Project Odyssey consumed 2,150 tons of steel, 740,000 feet of electrical cables and 170,000 feet of pipes.

→ Production Upgrades
  • low sulphur diesel fuel
  • improve the refinery's environmental performance
  • enable Suncor to integrate a broader slate of crude oil products, including sour crude oil from the company's Canadian oil sands production.
  • increase in the refinery's ability to process bitumen used in asphalt production.

→ Suncor's U.S. businesses
  • provides a vital link between the company's large scale oil sands resource base and the growing U.S. energy market
  • major supplier of Colorado's gasoline and diesel fuel, as well as jet fuel to the Denver International Airport
  • largest supplier of paving-grade asphalt in Colorado

→ Over the two years of the Commerce City refinery upgrade the project employed a peak construction workforce of approximately 1,300. About 75% of the total project budget was spent purchasing goods and services from Colorado-based businesses.

→ According to the Metro Denver Economic Development Corporation, the project brought more than $1 billion of economic activity to the area.
Asphalt Unit (AU) – The Asphalt Unit was modified with new metallurgy in order to run high-acid (TAN) crudes, such as those coming from oil sands. The project at the AU included a new atmospheric tower and a new vacuum tower.

Sulfur Recovery Unit (SRU) - The refinery's #2 SRU was modified to be able to add oxygen and recover more sulfur following the desulphurization process.

Tail Gas Unit (TGU) - The TGU was installed as part of a requirement to reduce the emissions from our SRU. Simply, the TGU makes both of the refinery's sulfur recovery units more efficient. Sulfur that is recovered in the SRU is recycled through the TGU resulting in a significant decrease in emissions to the air.

Hydrogen Plant - The new hydrogen plant uses natural gas to make hydrogen, which is used in the process of removing sulfur from diesel and gasoline.

#2 Hydrodesulphurization (HDS) Unit - The #2 HDS was modified to make ultra low sulfur kerosene. The refinery uses kerosene to blend with diesel fuel for cold weather properties.

#3 HDS -- The #3 HDS was modified to process ultra low sulfur diesel.

#4 HDS - The #4 HDS, which was made in Italy and came by ship across the Atlantic Ocean and by rail from the Port of Houston to the refinery, was newly installed and will treat gas oil. Once the sulfur is removed, the gas oil is the feedstock that goes to the fluidized catalytic cracking unit (FCC) to make gasoline.

Tank 774 - The refinery installed a new 120,000 barrel storage tank that will hold sour distillate, which is feedstock for the #3 HDS unit.

Propane Storage System - The refinery's propane storage system was relocated in order to install the #4 HDS.

Sour Water Stripper - The new sour water stripper cleans the water used in refinery processes so it is suitable to go to the refinery's wastewater system.

Boiler Feedwater Treatment System - The refinery uses reverse osmosis technology to purify water. The refinery uses the boiler feedwater treatment system to treat city water to make it boiler feedwater quality which is used through the refinery to make steam.

Pipeline from Xcel Energy - Modifications were made to the natural gas system that feeds the refinery.

New Cooling Tower - The new cooling tower increases the refinery's cooling water circulation capability.
BIG!
Single largest cargo item crosses Houston’s city docks

SINGLE LARGEST CARGO ITEM CROSSES HOUSTON’S CITY DOCKS

It’s definitely bigger than a bread box. It’s bigger than an elephant or a whale. Maybe the space shuttle is bigger. To be sure, it’s the biggest and heaviest thing ever to unload at the Port of Houston.

In late March, an oil refinery reactor unit — weighing in at 570 metric tons — unloaded at City Dock 16. The unit belongs to Suncor Energy and was bound for the company’s refinery in Commerce City, Colo. Located six miles northeast of Denver, the refinery produces 60,000 barrels of oil per day, and this unit, also called a hydrotreater, will be used to produce low sulfur diesel fuel.

The reactor cost about $4 million and required another $4 million in global multimodal shipping costs. It is 150 feet in length and 14 feet in diameter.

“This is the biggest and heaviest vessel not only to cross Houston’s docks, but is also the biggest and heaviest vessel to be transported by rail in the U.S.,” said Ron Gremler, project director for Suncor Energy. “This reactor is going by rail from zero elevation in Houston to one mile high...
Project Odyssey – Gasoil Hydrotreater
Project Odyssey upgraded metallurgy to be able to handle all High TAN crudes from standard Canadian Heavies (nominal TAN 0.6-1.0) up to OSH with a TAN of 3.5

Key Sour Crude Vacuum unit originally planned to be 317L clad but new 317L vessel built instead.

Upgraded metallurgy from atmospheric distillate draws through resid rundown.

Once upgraded, optimization based on full yield/crude optimization – no TAN limits
Denver Refinery... “a new era”...
Crude quality breakdown

... Suncor Synthetics
... Canadian Heavy
... Colorado Sweet
... other Padd 4 crudes
Downstream integration

- Approximately 443,000 bpd of refining capacity
- Higher than average complexity
- Current and future potential oil sands integration volumes
- Over 20% of the Canadian downstream market
- High margin lubricants production

A balanced portfolio of assets, combined with our integrated model, enables optimal value creation in our Refining & Marketing division
... Suncor Synthetics

OSH
- key integrated stream with Project Odyssey
- sour virgin gasoil rich crude
- integrated with Denver (project Odyssey) / Sarnia (project Genesis)
  TAN = 3.5 mg KOH/g
  Sulfur = 3 wt%
  "resid free" at injection
  "fully hydrotreated naphtha front end"

OSA - standard sweet synthetic blend
OSC - specialty sweet synthetic blends

BHB - dilbit - SAGD Bitumen plus Hydrotreated Naphtha
MKH - synbit - SAGD Bitumen plus OSA
... Canadian Heavies

Continuing with historic success running Canadian “standard”

Asphalt crudes
  - Bow River
  - Lloyd Blends
  - Cold Lake

In addition, Denver is now actively running Western Canadian Select (WCS) (started shortly after stream created in 2004)
... Colorado Sweet

Continues to be an integral part of Denver Refining
- Diverse fields ranging from 35 to 60 API
- Generally very sweet conventional crude rich in Naphtha
- Truck and pipeline delivery to Refinery

Source: U.S. Energy Information Administration

Nominal 83000 bpd
Nominal 66000 bpd
Nominal 50000 bpd
Denver Refinery - Crude Qualities

Northern PADD 2 and PADD 4 crudes
Key integration with most available conventional crudes (light sweet to medium sours)
from North Dakota (sour and sweet), from Rocky Mountain system and Wyoming

- Monthly North Dakota Field Production of Crude Oil
- Monthly Wyoming Field Production of Crude Oil
- Monthly Montana Field Production of Crude Oil

Source: U.S. Energy Information Administration
Thank you.

Forza Azzurri!