

# Partial Upgrading

## What is partial upgrading?

**Partial upgrading** reduces the thickness of oil sands bitumen so it can flow through pipelines more easily, without having to be blended with diluent.

This increases the amount of bitumen product that can be shipped on pipelines because less diluent is needed. Partial upgrading would also enable more refineries to process Alberta bitumen product and would not limit future opportunities for full refining within Alberta.

Partial upgrading facilities are less capital intensive and have lower operational costs than full upgraders used to produce synthetic crude oil.

## Potential benefits of partial upgrading

Partial upgrading could enhance the competitiveness of the oil sands sector by reducing costs, increasing pipeline capacity, and requiring less diluent to be purchased.

In 2016, oil sands companies in Alberta purchased \$13.3 billion worth of diluent, much of it imported.

### Increased market access and price

Bitumen that goes to market without upgrading or refining has historically been sold at lower prices compared to other crude oils.

Partial upgrading could help reduce this discount by improving the quality of the product and increasing the number of refineries capable of processing it.

### Significant cost savings and more pipeline capacity

Diluent is one of the largest costs for bitumen producers. Partial upgrading requires little or no additional diluent and effectively increases pipeline capacity by as much as 30 per cent.

### Benefits include:

- Increased prices
- More market access
- Cost savings on diluent for industry
- More pipeline space
- Reduced GHG footprint of bitumen

## Lower capital intensity and lower operating costs compared to full upgrading

Partial upgrading is cheaper to do than full upgrading because it requires less processing. This results in lower capital costs to build the facilities.

## Reduced emissions

Removing the heaviest and less desirable components in bitumen avoids these high carbon content components (similar to coal) being combusted and generating carbon dioxide emissions.

In addition, diluent would no longer be blended with bitumen and shipped via pipeline, then extracted at the receiving end and shipped back to Alberta.

This would result in significant energy and cost savings meaning that partial upgrading has the potential to generate fewer carbon emissions on a lifecycle basis.

## What is the economic impact to Alberta?

Government will support up to \$1 billion for partial upgrading in Alberta.

This is expected to attract two to five partial upgrading facilities in Alberta representing up to \$5 billion in private investment and create 4,000 jobs in construction.

A [study](#) by the University of Calgary\* estimated the impact of partial upgrading could be worth up to \$22 billion in GDP growth over 20 years.

\*University of Calgary, School of Public Policy  
[Public-Interest Benefit Evaluation of Partial-Upgrading Technology](#)  
January, 2017