

| Process configuration | Syncrude output | API Gravity | Sulphur | Investment cost | Capex * |
|-----------------------|-----------------|------------------|---------|-----------------|------------------------------|
| | b/d | API ^o | wt % | \$ million | \$ thousand per daily barrel |
| RVBR | 81 508 | 12.5 | 4.10 | 889 | 10.9 |
| GOHT | 80 048 | 18.0 | 3.80 | 1 278 | 16.0 |
| GOHT, RVBR | 84 576 | 20.8 | 3.30 | 1 333 | 15.8 |
| SDA, GOHC | 86 900 | 23.6 | 3.20 | 1 350 | 15.5 |
| RDCK, GOHT | 67 538 | 32.4 | 0.13 | 1 250 | 18.5 |
| RDCK, GOHC | 71 009 | 46.8 | 0.00 | 1 556 | 21.9 |
| RHCR, GOHT | 87 832 | 25.9 | 0.90 | 1 694 | 19.3 |
| RHCR, GOHC | 93 126 | 40.4 | 0.90 | 2 000 | 21.5 |

* Capex = capital investment per daily barrel of plant output capacity

RVBR = visbreaking applied to residue from distillation processes

GOHT = hydrotreating of gas oil from distillation processes

SDA = solvent de-asphalting applied to residue from distillation processes

GOHC = hydrocracking of gas oil from distillation processes

RDCK = delayed coking applied to residue from distillation processes

RHCR = hydrocracking applied to residue from distillation processes

Assumed 100 000 b/d input of which 20 000 b/d is diluent recycled to field, 80 000 b/d bitumen at 8.6^o API gravity and 4.8% sulphur

All configurations assume bitumen is passed through atmospheric/vacuum distillation processes

Costs are 2005 US\$

Figure 4.7 Investment cost per daily barrel for upgrading bitumen to various grades of synthetic crude oil (Source: Vartivarian and Andrawis, 2006).