

A Forecast of Capital Requirements for the Oil and Gas Industry Through 2030

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Overview

Using IEA and EIA demand forecasts for crude oil and natural gas through 2030 we develop an estimate of global capital requirements (CAPEX) and investment timing for the upstream and refining industries. The model is probabilistic in oil demand, cost inflation, maintenance capital expenditures, field development lead times and refinery construction lead times. Oil production is subdivided between OPEC and non-OPEC. Reserve to production ratios are allowed to vary from 2007 levels. Spare capacities for production and refining are built into the model to reflect historical trends. LNG infrastructure CAPEX requirements are incorporated in the model as generic infrastructure investments such as pipeline and tankers. The model assumes business as usual with limited impact of alternative or renewable resources on demand.

Methods

Forecasts of existing fields' production rate decline coupled with growth in demand create the required annual production rate make-up volumes for each year in the forecast. Capital requirements for both field development and refinery construction are developed from recent historical trends using cost of finding and developing data and Nelson cost indices for refining. Historical infrastructure financing data are compiled and analyzed to develop expectations for transportation and LNG projects through the forecast period.

The results are compared with the recent IEA forecast to provide a point of reference. Similarities and differences are considered and evaluated for their significance.

Results

The Platts CAPEX investment model forecasts annual CAPEX to first exceed \$1 trillion (in 2006 dollars) in 2016 and \$2 trillion in 2026. Aggregate CAPEX for the period 2007 through 2030 is \$21.4 trillion. These estimates incorporate the impacts of growing costs using recent trends. The majority (76%) of the CAPEX is associated with the upstream exploration, development, and maintenance of crude oil supply. Refining (22%) and LNG plus transportation (2%) complete the allocation of investment requirements.

The model indicates a need to have spent \$350 billion in 2006 to assure adequate crude oil production in 2010 but IEA estimates of total expenditures are only about \$230 billion, indicating a shortfall in capital investments may have already put the industry behind the spending curve.

For purposes of comparison, the IEA World Energy Outlook 2006 forecast is \$9. trillion. The differences in assumptions and methodology between the IEA and Platts are described, but the primary difference is Platts's inclusion of cost growth. If cost growth is taken as zero in the Platts CAPEX investment model (described as "2005 dollars" in the IEA report), the aggregate upstream CAPEX is \$9.4 trillion, \$2.3 trillion for refining, and \$0.34 trillion for LNG plus transportation. Exclusion of cost growth still leaves the Platts CAPEX investment model forecast more than 35 percent higher than the IEA forecast.

Conclusions

The Platts CAPEX investment model forecast is significantly less optimistic than the IEA's 2006 projections. The IEA modeling suggests a gradual increase in capital demand over the 24-year forecast horizon. The Platts model requires a rapid ramping of capital allocation to oil and gas development first exceeding \$1 trillion (nominal) per year in 2016.

Platts' estimate of aggregate capital obligations (oil and gas development, refining and transportation) between 2007 and 2030 is \$21.4 trillion (nominal). The IEA 2006 estimate is \$9 trillion. The model indicates a need to have spent \$350 billion in 2006 to assure adequate supplies in 2010 but IEA estimates of total expenditures are only about \$230 billion indicating a potential shortfall in capital investments have already put the industry behind the spending curve. The key sources of difference between the two forecasts are:

- IEA's use of multinationals' capital demand forecasts through 2010 versus Platts's use of average COFD to estimate development costs;
- Platts' use of R:P ratios to estimate production rate from newly developed reserves and reservoir engineering concepts to project new field production profiles' contribution to the supply profile;
- Cost of surplus production capacity to mitigate supply risk incorporated in the Platts forecast; and
- Platts's extrapolation of development and construction cost inflation trends.

Both the IEA and Platts forecasts have weaknesses in their assumptions and computational approaches. These shortcomings highlight the importance of maintaining the forecast with updates and improved analysis approaches in order to ensure that supply is planned and developed in a timely fashion to meet demand. Failure on the part of producing nations and multinational oil and gas companies in this effort will lead to temporary shortages over several years, causing debilitating price spikes.

References

World Energy Outlook 2006, International Energy Agency, Paris (2007).

Deutsche Bank Ag Global Markets Research, July 2007.

Bank of America Securities, "E&P Sector 5-Year Outlook (2007-2011)", Robert Morris and Michael Schmitz, June 12, 2007.

Platts Oilgram, various issues (2006-2007).

