Global CAPEX & Maintenance Forecast

Revised Using 2011 Model

Arthur D. Little's energy practice forecasts growth in Global CAPEX and maintenance spending of 3.8% CAGR from 2011 to 2016 with most of the growth driven by new investments in exploration and production. By 2016 we predict that spending on new-build facilities in selected energy-based industries will increase by 3.8% CAGR, with maintenance spend showing overall growth of 4.1% CAGR to 2016 with most of the growth coming from outside Europe and North America. Our overall global forecast for growth for specific maintenance consumables used in new-build and maintenance suggests a CAGR of 4.2% with the strongest growth coming from the petrochemical and E&P segments and the Middle East, Asian and Latin American markets showing the strongest growth opportunities. In contrast, ADL forecasts that the market for consumable products in Europe and North America will experience relatively weaker growth of 3.1%-3.4% CAGR over the period 2011 to 2016.

This market research note presents Arthur D. Little's recent forecasts for global expenditure in four key process industries for capital expenditure, maintenance and spending on specific consumable products. The research was carried out in spring 2011 and reflects exchange rates and built-in expectations of energy prices around this time[1]. For the power generation market, we have adjusted our forecasts to reflect the impact of recent changes in, and future expectation of, nuclear power generation and recent changes in the cost of construction.

The model was developed to estimate growth in global CAPEX, maintenance and inspection activity and the associated market demand for the types of products that are generally used during construction and replaced during maintenance in process industries, which could be termed specific maintenance consumables. These classes of products typically include items such as: gaskets, "o" rings and other static seals and compression fittings, tubings, and filters that are typically replaced as part of maintenance. Throughout this note, the term consumables refers to this group of products.

The forecasts are based on CAPEX and maintenance estimates for these products and cover the following four industries:

- exploration and production in the upstream oil and gas industry
- refining
- chemical
- power generation

Our forecasting model is based on credible data from:

- the International Energy Agency (IEA) World Energy Outlook
- the ICIS database which covers over 350 projects in bulk chemicals
- Oil and Gas Journal surveys which cover approx. 400 projects in refining and petrochemicals, and over 950 plants in refining and petrochemicals
- ADL databases on capital costs
- ADL research and interviews with over 50 industry experts to cover OPEX and maintenance costs and trends, evolution of maintenance cycles etc.

Results have been validated through a series of interviews with market participants and as part of our ongoing casework in industry strategy, due diligence and expert witness for arbitrations.

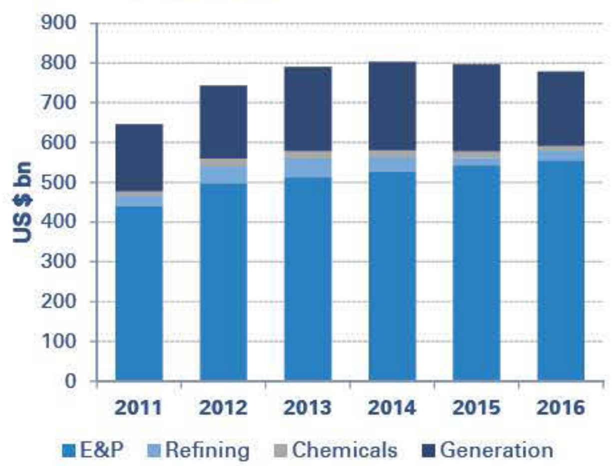
1 If you require an updated version of this report or need further information and breakdown by industry and region please contact the authors

Global CAPEX and maintenance spend

CAPEX

Our forecast of CAPEX spend in selected energy-based industries shows an overall growth trend of 3.8% CAGR over the period 2011 to 2016 and could reach in excess of $750 billion.

Figure 1. Global CAPEX spend forecast to 2016 by segment – revised 2011 model



Source: IEA, EIA, Oil and Gas Journal, ADL analysis

The sectors in our review each have different drivers for capital expenditure:

- In upstream exploration and production the current demand for oil and high oil prices are making more complex developments economic. We believe the current high levels of annual investments will reach a level of around $550bn p.a. by 2016 with a steady CAGR of 4.8%.
- In power generation we forecast strong growth to 2014 driven by demand for electricity from localised economic growth and industrialisation, as well as retirements of aging plant in developed countries. Some investment will be needed to deal with delays or abandonment of nuclear power generation and as a result we forecast investment in gas and coal-fired power stations to make up the shortfall in the mid-term with a CAGR overall of 2.1% to 2016. Beyond 2016 we expect a strong pick up in power generation as delayed nuclear capacity comes online in Asia.
- In refining the main driver is the demand for oil products in relation to current refining capacity. We see CAPEX spending increasing to 2013, as projects previously started are completed, with a marked decrease in CAPEX thereafter resulting in a CAGR of -1.5%.
- In chemicals we see cyclical demand driven by global economic trends. We believe we will see strong growth to 2013 followed by a gradual decline beyond 2013 with a return to current levels of CAPEX by 2016.

Overall for the four industries covered above we see the strongest growth potential in South America and Africa with relatively weaker growth – but strong CAPEX spend – in Europe, Middle East and Asia Pacific.

Maintenance

For each sector we estimated maintenance costs relative to current installed capital base with different maintenance benchmarks per sector depending on the scale of the maintenance work required, on the types of facilities involved and the length of time required between planned maintenance work in different industries.

Figure 2. Maintenance spend by segment and geography revised 2011 model

Source: IEA, EIA, Oil and Gas Journal, ADL analysis

Some plants require full shutdowns for maintenance periodically and in this case we have allocated the expenditure for maintenance over the period to develop an annual figure.

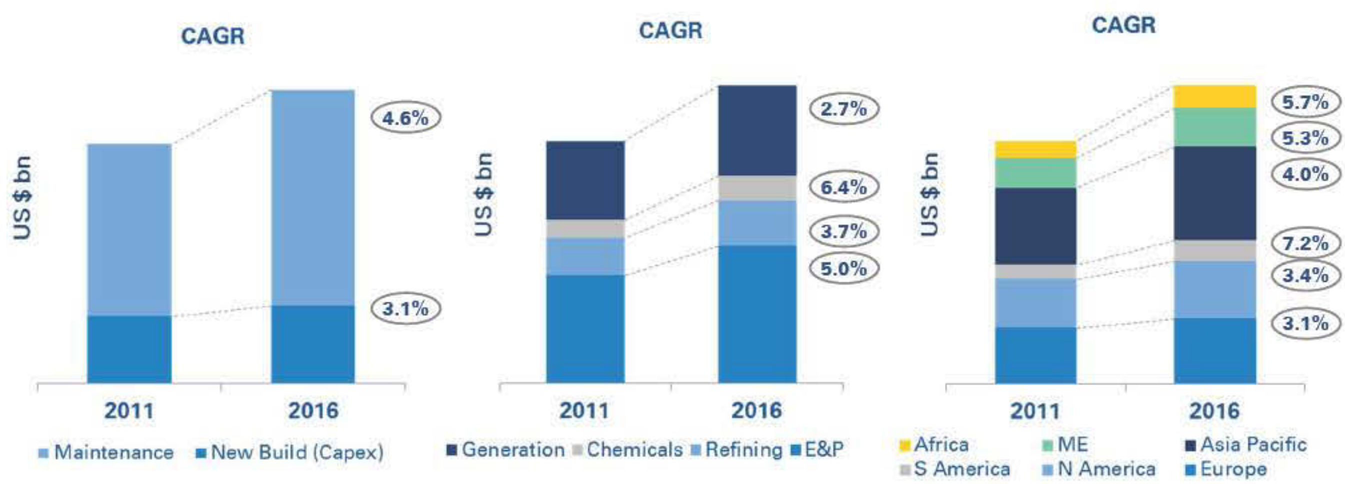
We predict an overall growth in maintenance of 4.1% CAGR to 2016 with the strongest growth from the petrochemical sector (7.3% CAGR) and the weakest growth in maintenance spending in power generation (3.0% CAGR). In terms of geographical spread we forecast the strongest absolute growth in maintenance spending in South America and the Middle East (with CAGR to 2016 of 6.9% and 6.2% respectively) and relatively weak growth in Europe and North America (CAGR of 2.6%). Asia Pacific will represent the largest absolute global growth opportunity and accounts for just over 40% of the maintenance growth between 2011 and 2016 with a CAGR of 5.2%.

Forecast spend on consumables from new build and maintenance

Based on capital expenditure and maintenance spend on plant in upstream oil and gas, oil refining, chemicals and power generation, we have estimated the growth rates for the market for consumables, based on the relationship between total spend and consumables spend in the various segments for CAPEX and maintenance projects. The size of the demand will depend on the typical % of the maintenance spend accounted for by different consumable products.

Our overall global forecast for growth for consumables suggests a CAGR of around 4.2% to 2016. The figures below present our forecast growth for different markets and an overall breakdown of activities between CAPEX investment and maintenance activities.

Figure 3. Consumables spend forecast overall – revised 2011 model



Source: IEA, EIA, Oil and Gas Journal, ADL analysis

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Arthur D. Little

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