

Offshore Oil & Gas Cable Market

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Good morning ladies and gentlemen.

The title of my presentation today is the offshore cable market, and following on from the previous excellent presentations looking at this business I will attempt to explain a little about the use of cables in this sector.

Offshore Oil & Gas Cable Market

- Cable Market Dimensions
- Market Evolution
- Comparison with Other Markets and Main Manufacturers
- Market Characteristics
- Summary

Firstly I will look at the size of the market and some recent growth trends along with details of some further market segmentation.

Then I will look at what are the main drivers and discuss how the market may evolve.

I will look at how the market compares with other markets and who are the main players.

I will then look at some of the main market characteristics before finishing off with a summary.

Offshore Oil & Gas Cable Market Definitions

- **Topside Cable** – Cable used on the platform structure.
- **Sub Sea Cable** – Cable used under water to carry power or control functions.
- **Umbilical Cable** – Cable that is usually a mixture of hydraulic pipes and electrical elements, may also contain flowlines.

This presentation covers topside and sub sea cables but does not include umbilical cables.

Just to begin with, it is important to clarify exactly what I am covering in this presentation.

By offshore cable we mean cable that is used on or associated with platforms and other structures for the exploration and extraction of oil and gas fields cited under water. Cables used for onshore oil & gas exploration and extraction and in refineries and other processing plants are not included in this presentation.

Offshore cables can be split into three categories. These are:

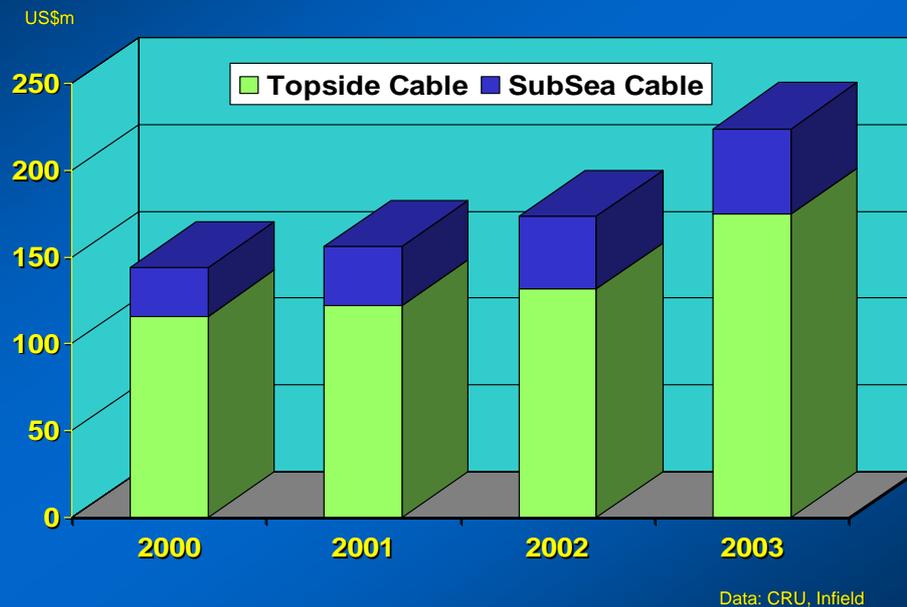
Topside Cables – cables used above the water on offshore platforms and drilling rigs.

Sub Sea Cables – cables used under the water, often to connect a mother platform with a number of satellite platforms.

Umbilical Cables – flexible cables in which the electrical element is often only a minor part of the cable, which may contain hydraulic lines and may also be used to carry extracted oil and gas.

This presentation covers the first two categories but does not cover umbilicals, which are primarily made by specialist companies.

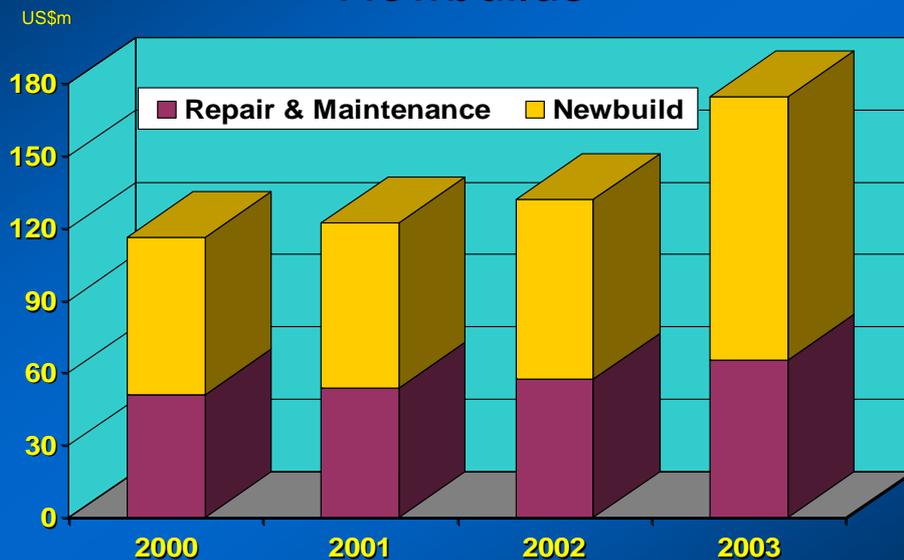
Growing Demand for Offshore Cables



Here we can see that the market for offshore cables has grown quite quickly from US\$144m in 2000 to US\$244m in 2003. This represents an increase of almost 70%.

The largest part of the market is topside cables and here demand has grown from US\$116m in 2000 to US\$175m in 2003, a rise of just over 50%. Meanwhile the sub sea cable sector has grown from US\$28m in 2000 to US\$50m in 2003, a rise of almost 80%. Thus it can be seen that the sub sea sector is growing at a greater rate than the topside sector. This has resulted in the topside share of the market falling slightly from 80% in 2000 to 78% in 2003. We will look in more detail at what is driving the two sectors later.

Growth in Demand for Topside Cable is from Newbuilds

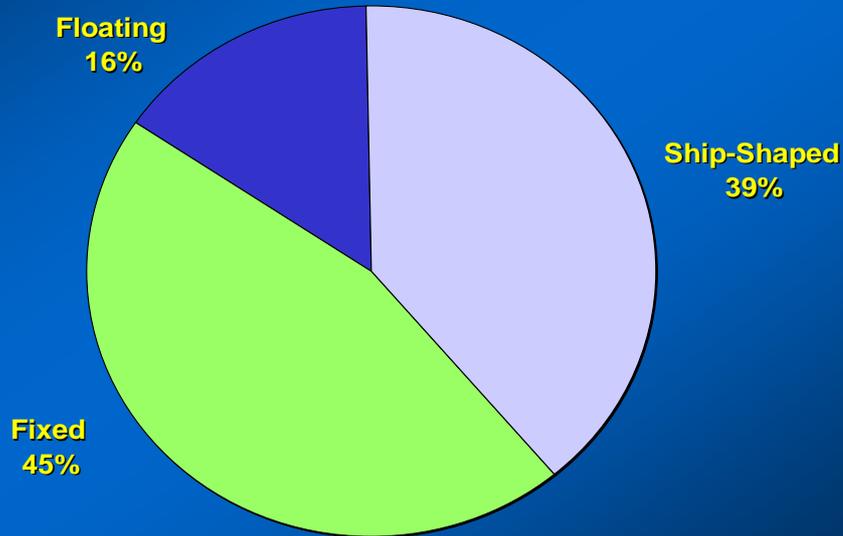


Data: CRU, Infield

If we now focus on the topside cable sector there are two elements to this. The first and largest element is cable used in newbuilds ie. new platforms or floating exploration and production vessels. The increase in investment in the offshore sector driven by the high oil price has led to some growth in new platforms and vessels and this, along with some other factors that we will look at later, has led to strong growth in demand for cable for use in newbuilds. In 2003 we estimate that the newbuild sector accounted for 63% of the total market, up from 56% in 2000.

The other sector is repair and maintenance. As well as routine maintenance and repair of damaged cables there is also significant use of cable due to expansion and modification of existing platforms. This is particularly the case in the more mature regions of the world, with the two largest markets for repair and maintenance cables being the North Sea and the Gulf of Mexico. We estimate that almost two thirds of the world market for repair and maintenance cables is from these two regions. The repair and maintenance sector is generally less volatile than the newbuild sector, since it is related to the number of rigs in operation as well as investment levels, whereas newbuild demand is more dependant on industry investment.

Offshore Cable Demand for Newbuilds by Rig Type



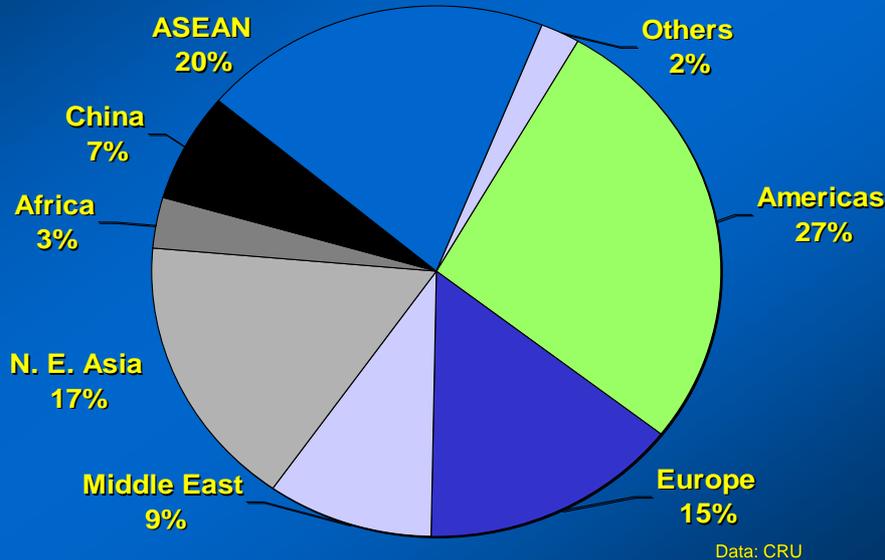
Data: CRU, Infield

New platforms can be split into two main categories which are fixed and floating. Fixed platforms, as their name suggests, are attached to the seabed and can range in size from a small unmanned satellite platform to some of the largest manufactured structures on earth. Fixed platforms are not suitable for deepwater fields, with the definition of deepwater being water depths of greater than 500m.

Floating platforms, which are used for deepwater fields and can also be used to connect to sub sea wells, can be further subdivided into two categories, floating and ship-shaped. Floating platforms are similar to fixed platforms above the water, but below the water they are not fixed to the seabed, but are anchored or held in position using a variety of methods. Ship-shaped platforms are, as their name suggests, basically a ship on which a oil or gas rig is mounted. In some cases these are built from scratch, but they can also be built by modifying an existing ship. Typically a ship-shaped platform uses more cable than a fixed or floating platform since as well as the cable needed for the rig there is the additional cable needed for all the ships normal functions such as engines etc.

In 2003, for the first time, newbuild cable demand for use on fixed platforms fell below 50% to 45%, illustrating the growth in importance of floating platforms. The main growth has been in ship-shaped platforms which consumed 38% of the total newbuild market, up from 30% in 2001. As we will see later this shift towards more floating platforms has implications for the pattern of cable demand.

The Americas is the Largest Market for Topside Cables in 2003

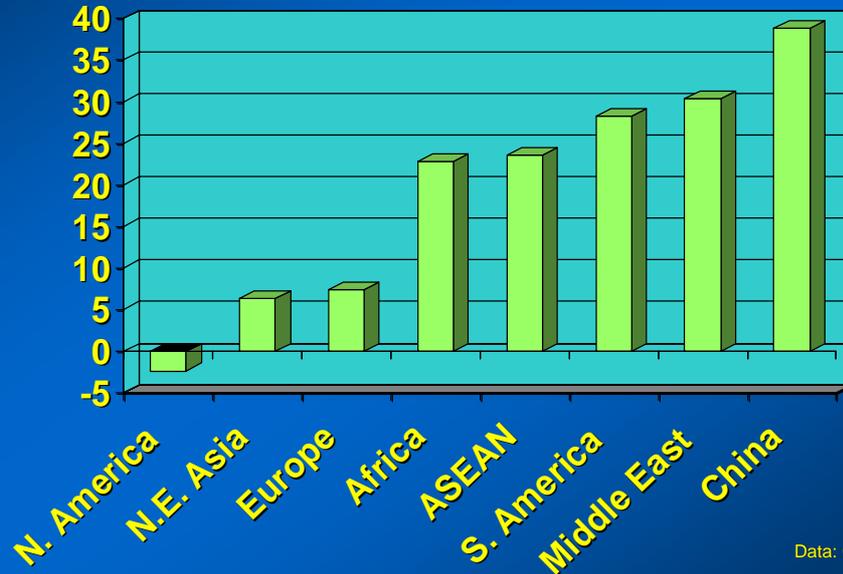


In this slide we show the geographical split for all topside cable demand ie. both newbuild and repair and maintenance, in 2003. This is based on where the cable is used and not necessarily where the cable is ordered. The largest market is the Americas, but its share has been falling in recent years, despite a growth in demand in South America. The second largest region is now the ASEAN countries where a combination of increased activity in offshore fields in the region and growth in production of floating platforms for other regions, particularly in Singapore, has driven strong growth in cable demand.

In North East Asia, the largest market is South Korea, which has also been very successful in recent years in winning business for floating platforms, particularly ship-shaped ones. Consequently the greatest growth in demand has been from Asia, and in 2003 we estimate that 40% of the total market for topside cables was in Asia, up from 34% in 2000.

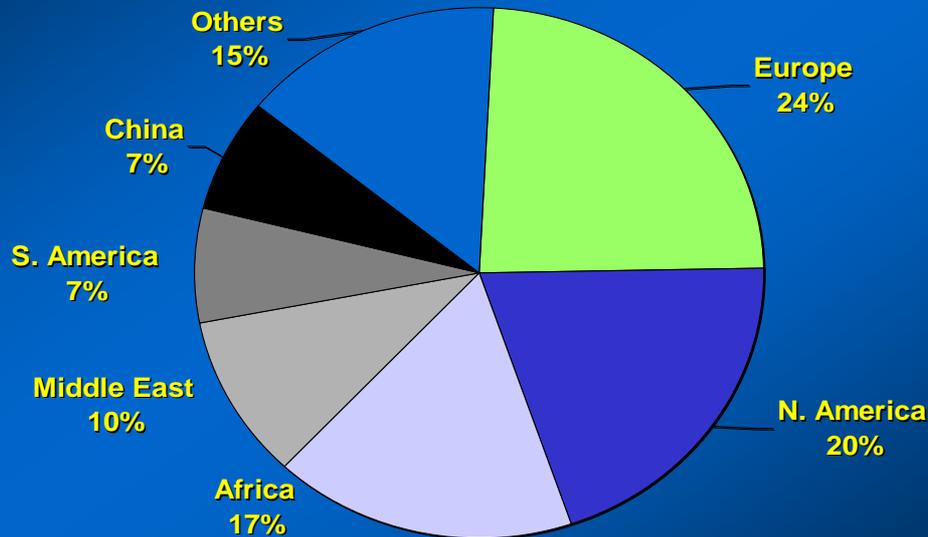
Regional Growth Rates in Topside Cable Market

% Compound Annual Growth Rate 2000-03



Looking at the compound growth rates for the period 2000 to 2003 we can see that the fastest growth has been in China, the Middle East and South America. The North American market has been quite flat and growth has only been modest in Europe. The growth rate in N.E Asia has not been large over this period, but this is in part due to timing. Because this region is primarily dependant on orders for new platforms the market on a year by year basis is quite volatile so growth rates depend on the period chosen.

Europe is the Largest Market for Subsea Cables in 2003

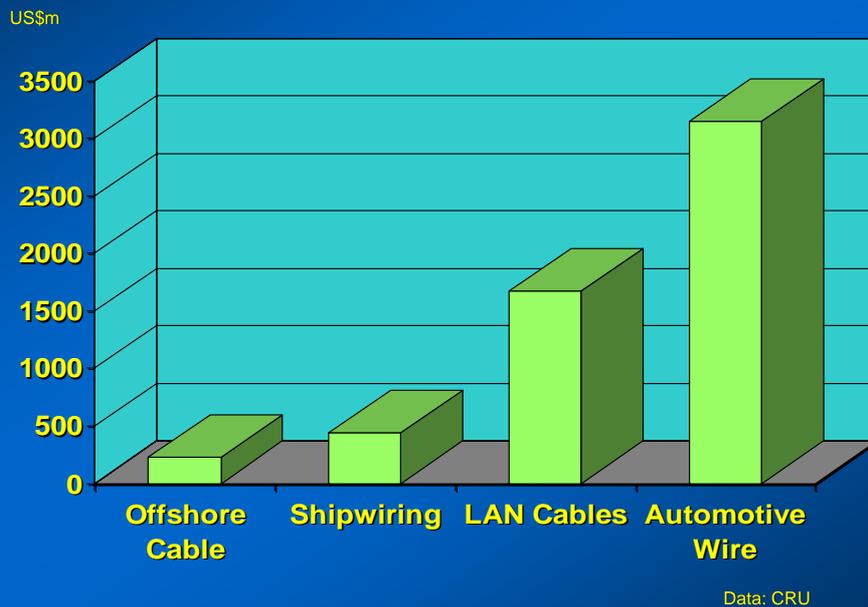


In the sub sea cable market the largest sector is Europe, which in 2003 accounted for almost a quarter of total demand. There has been increasing use of smaller unmanned platforms and sub sea wells in the North Sea to enable economic development of smaller fields and these two techniques require the use of more sub sea cable than the traditional large platforms.

The use of unmanned satellite platforms involves the linking of these platforms to a mother platform by sub sea cables that provide both power and control functions. Often a single mother platform will have links to a number of satellites.

Sub sea wells involve the installation of the well head and associated equipment on the sea bed, thus doing away with the need for a permanent fixed platform. Power and control functions for the well head are provided by sub sea cable that can either be connected to a platform or in some cases from dry land.

Relative Size of Offshore Cable Market

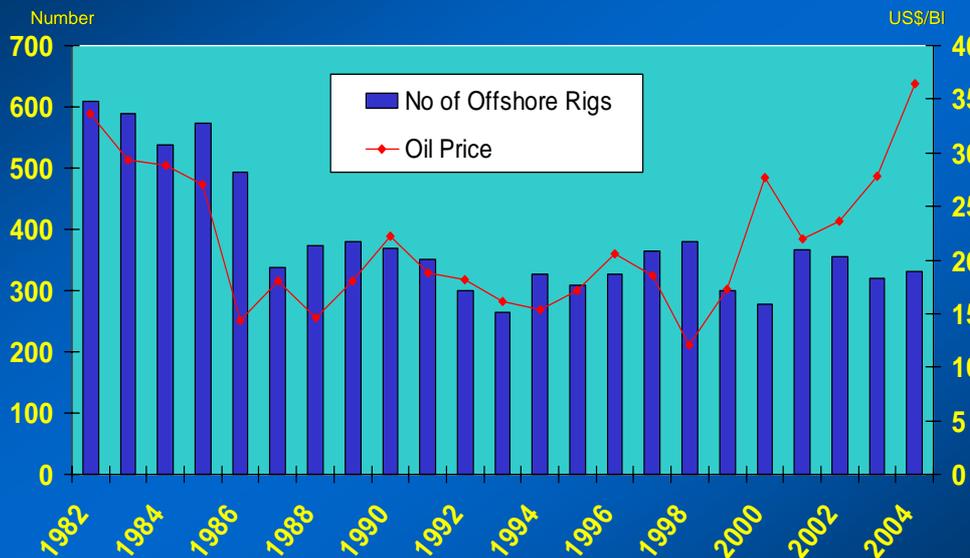


To put the size of the offshore cable market in perspective this chart shows the relative size of the world market in 2003 compared to the world market for shipwiring cables, copper LAN cables and for automotive wire and cable.

Although the offshore cable market is an important niche for some manufacturers, it is only a niche. It is half the size of the shipwiring cable market, but it is just 13% of the size of the copper LAN cable market and 7% of the size of the automotive wiring market. The offshore cable market makes up only around 0.3% of the total wire and cable industry.

It is difficult to generalise on the relative margins associated with different product sectors, but it is our view that as a specialist niche then margins on offshore cables are generally higher than for bigger volume commodity cables. Certainly the margins for sub sea cables are thought to be higher than for topside cables, where growing competition is putting pressure on price levels.

Total Number of Offshore Rotary Rigs in Operation Related to Oil Price



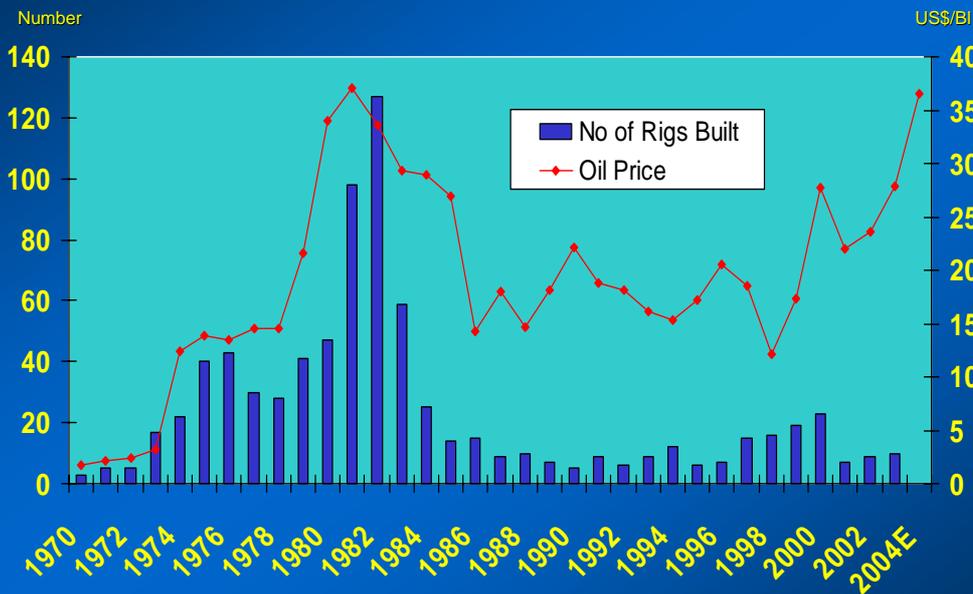
Data: Baker Hughes, CRU

The next couple of charts look at the historical relationship between the price of oil and activity in the offshore sector.

In the first chart we look at the number of offshore rigs in operation compared to the price of oil. We have data going back to 1982 and for the period 1982 to 2001 there was quite a close correlation between the number of offshore rigs in operation and the price of oil. Towards the end of this period though there were signs that this relationship was breaking down. In 2000 the price of oil jumped but the number of rigs in operation fell, but this could be explained by a lag factor and in 2001 the number of rigs rose, although the price of oil fell back. However, since 2001 the price of oil has climbed quickly with the number of rigs remaining relatively constant.

The main reason for this decoupling of the relationship seems to be the slowdown in finding and exploiting of new reserves in the two main offshore regions of the North Sea and the Gulf of Mexico and also the growth in use of sub sea wells. The small increase in the number of rigs in operation may seem at odds with our view that cable demand has been rising but in part it can be explained by the fact that whilst there has been growth in new rigs in many parts of the world in reaction to the higher oil price, this has been balanced by a reduction due to decommissioning of some rigs in the North Sea and the Gulf of Mexico.

Construction of Drilling Rigs Related to Oil Price



Data: Rigzone, CRU

This slide looks at the construction of drilling rigs related to the price of oil from 1970 to 2004. Drilling rigs are primarily used for exploration purposes. At this point it is worth noting that we have used a number of sources for our data on platforms and rigs in operation and construction, and that there is often a conflict between the various data series. To derive our cable consumption data we have used data from Infield Systems. But for these charts we have used rig data from Baker Hughes International and Rigzone.

In the early days of offshore industry the number of drilling rigs followed the trend in oil price quite closely. Since the early 1980's the number of new drilling rigs being built has been relatively low and stable although there was a growth at the end of the 1990's, which coincided with a rise in the oil price. However, as was seen in the previous slide, the surge in oil price that we are currently seeing is only having a limited impact on construction of new drilling rigs. This is thought to be because main driver for demand of drilling rigs is now the availability of potential new field development sites rather than the price of oil.

From these two slides we have concluded that the close relationship between the demand for offshore rigs and the price of oil is becoming much looser and that a number of other factors are growing in importance in relation to driving offshore cable demand.

Drivers of Demand for Topside Cables

The key drivers of future market demand for topside cables are:

- **Increased importance of deepwater fields is leading to greater use of floating platforms and mobile production vessels which are more easily moved.**
- **Increasing competition from shipbuilding yards**
- **Floating production vessels are typically quite cable intensive with increased use of MV cables**
- **Increased use of subsea wells and satellite rigs, particularly in the more established offshore fields such as the North Sea**
- **Decline in new field development in the more mature regions such as the North Sea and the shallow waters of the Gulf of Mexico**

Which brings us to some slides looking at what are the important drivers for future cable demand. In the first I have identified what I believe are the main drivers of topside cable demand.

An important driver will be the continued growth in floating platforms as the relative importance of deepwater fields grows. Fixed platforms tend to be built near to their installation location since they are difficult to transport. In contrast floating platforms are much more easily transported and in the case of ship-shaped vessels there is no real limitation as to how far they can be moved. This has allowed yards that have mainly been involved with shipbuilding to enter the offshore sector. Since the main centres of shipbuilding are in Asia this has allowed yards in places such as South Korea and Singapore to compete very effectively. We expect this trend to continue and that China will grow in importance both as a base for construction of platforms for use in its own growing offshore oil industry, but also as a base for construction of platforms for use in other parts of the world.

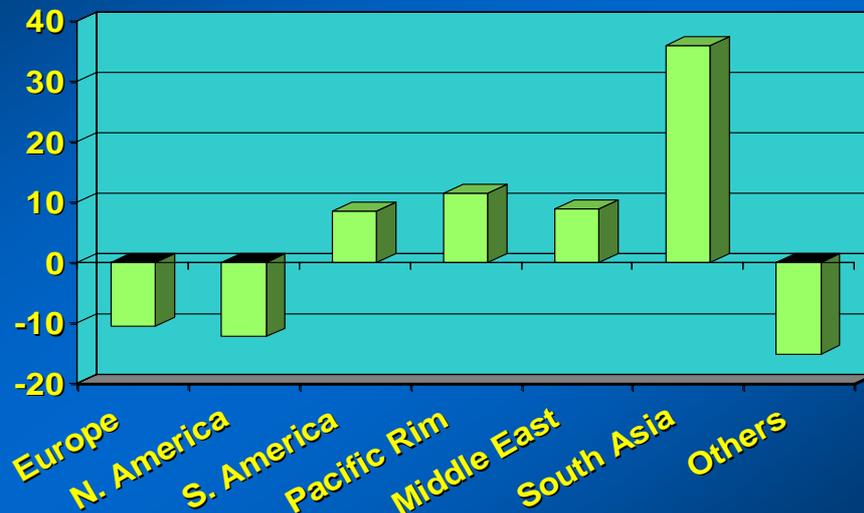
Also floating production vessels tend to be quite cable intensive. Earlier we saw that the number of rigs is not really growing despite rising oil prices, but cable demand is increasing. This can be partially explained because of the growing use of floating production vessels.

As has been noted previously there is increasing use of subsea wells and small unmanned satellite platforms to exploit more marginal fields. We expect this trend to continue with the result that although the price of oil is expected to remain relatively high the construction of new large platforms that use large volumes of topside cable in the mature regions will be reduced compared to historical activity.

Further influencing the shift in demand patterns to Asia is the relative maturity of the traditionally large markets in Europe and North America i.e. the North Sea and Gulf of Mexico regions. Although there is some scope for further development in these regions, particularly in deepwaters in the Gulf, the demand for new large fixed platforms is now much lower than in the past.

Declining Drilling Activity in Mature Regions

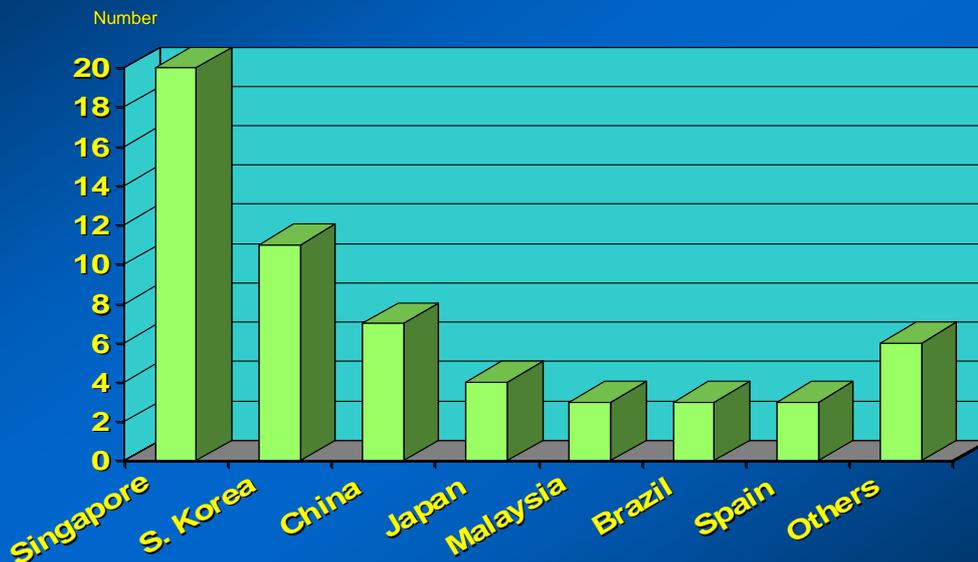
% Change Year-on-Year in Number of Drilling Rigs in Operation July 2004 v July 2003



Data: Rigzone, CRU

This slide illustrates this shifting pattern in offshore activity. This slide shows the percentage change in offshore drilling rigs in operation in July 2004 compared to July 2003, by region. It can be seen that for both Europe and North America there has been a significant fall whilst in Asia, and particularly South Asia, and South America there has been an increase in activity. Since drilling activity is an indicator of potential future platform demand, it can be seen where the greatest growth in demand is likely to come from.

Location for Construction of Ship-Shaped Vessels from 2000-04



Data: Infield, CRU

This slide illustrates the success that yards in Asia, and particularly Singapore and South Korea, have had in winning orders for ship-shaped vessels. Between 2000 and 2004 we have details of 57 vessels being constructed and over half of these have been built, or are under construction in, Singapore and South Korea.

If anything the stranglehold that these two countries have on this sector is growing. There are currently twelve vessels where we are aware of orders having been placed for completion in 2005 and 2006 and seven of these will be built in South Korea, four in Singapore. The single exception is one in Spain.

Drivers of Demand in the Subsea Cable Sector

The subsea cable market is expected to double between 2000 and 2004 with the prospect of further growth in the coming years. This is being driven by:

- Growing use of smaller unmanned rigs to develop marginal fields
- Development of techniques to enable subsea wells to be more widely used
- Potential development of offshore power generation using associated gas

What is bad news for future demand of topside cable is good news for the sub sea cable sector. The growth in the use of satellite platforms and the linking of platforms is driving increased growth in demand for sub sea cables to link these platforms to existing large platforms. The increased use of sub sea wells is also helping drive growth for sub sea cables and the distances between these wells and the control centres that they are tied back to are increasing. In some cases new offshore fields will be controlled from dry land.

Another development that could boost demand for sub sea cables is the potential development of offshore power generation using gas that would otherwise be wasted. This gas could be used to generate power that could then be transmitted via an HV DC sub sea cable to feed into a national grid.

Thus we believe that the potential for growth in demand for sub sea cables is greater than for topside cables.

Marketing Channels

There are a number of routes by which cable manufacturers supply the market:

- Direct from Manufacturer to Oil Company – Frame Contracts
- Direct from Manufacturer to Construction Yard
- Direct Order from Yard or Oil Company, but Cable Supplied via a Distributor
- Direct from Manufacturer to Wholesaler or Distributor

As is the case for many sectors of the cable industry there are a number of channels to market. In some cases, primarily Northern Europe, the oil companies themselves negotiate a frame contract, whereby terms for a range of cables are agreed between the cable manufacturer and the oil company. The oil company or any of its subcontractors can then order specific cable requirements against this frame contract. Alternatively an oil company will place orders on a project by project basis.

Alternatively the oil company will place a contract with a construction yard or electrical contractor and this yard or contractor will then place an order direct with a manufacturer for the specific cable requirements for the contract. A variation on this is when the order is placed direct with the cable manufacturer but a cable distributor is used by the manufacturer to help with the logistics in supplying the cable during the contract. This method is often used when the cable manufacturers production location is not close to the yard. Thus the cable manufacturer can ship bulk cable to the distributor, which then supplies cable to the yard as required.

Finally there is a significant volume of cable bought by specialist cable distributors, such as Anixter, for their own stocks. The majority of the repair and maintenance sector is serviced by specialist cable distributors that utilise their own stocks.

The relative importance of the various routes to market varies around the world, and of course it is also dependant on the mix of work in any particular market in any given year. In North America the cable distributor sector is the largest as a result of the relative importance of the repair and maintenance sector and also by virtue of the acceptance by the market of cable distributors. The cable distributors are also important in Europe. In Asia the much greater volume of newbuild activity and the much less developed cable distributor sector means that the majority of cable here is routed direct from the manufacturers to the construction yards, although in Singapore cable distributors often have some involvement.

Leading Offshore Cable Manufacturers

- The leading manufacturers of cables used in the offshore oil and gas industry are **Nexans** and **Draka**.
- Other Important manufacturers are **Pirelli**, **General Cable**, **LG Cable**, **Amercable** and **Rockbestos**.
- These companies, other than Amercable and Rockbestos, are also the leading manufacturers of shipbuilding cable along with **Jinro**, **Marine Industrial Cable** and **Hien Electric Industries**.
- As the Chinese shipbuilding industry develops then it is likely that some Chinese manufacturers will emerge as international players in this market.

As we have seen the offshore cable sector is not large in global terms, but there are a number of leading manufacturers around the world, many of which are leading international cabling groups.

The leading manufacturers in this sector are Nexans and Draka. They manufacture cable in a number of locations, and both have production bases in the important Asian market. Nexans position was strengthened by the acquisition of Korean firm Kukdong. Nexans is a leading producer of sub sea cables, but Draka concentrates on topside cables.

Other leading manufacturers are Pirelli (mainly in Europe), General Cable, Amercable and Rockbestos (mainly in North America) and LG Cable in Korea.

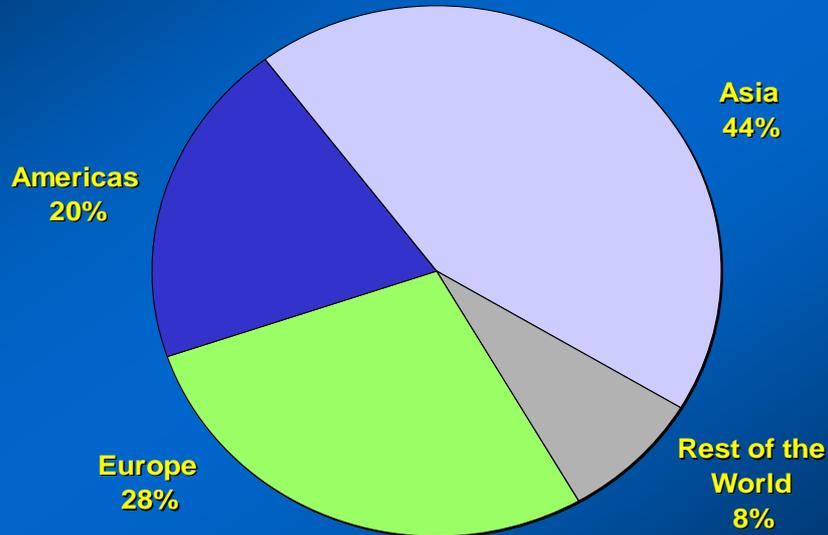
Since there is a lot of similarity between offshore cables and shipwiring cables, most of the leading manufacturers of offshore cables are also manufacturers of shipwiring cables. The exception to this is Amercable and Rockbestos, which are mainly focussed on offshore cables since the market for commercial shipwiring cables in North America is relatively small. Other leading manufacturers of shipwiring cables are Jinro in Korea, Marine Industrial Cable in the US and Hien Electric Industries in Japan.

Since the main market growth is likely in Asia, we would expect to see the emergence of some Chinese manufacturers in the coming years. At present the Chinese manufacturers are mainly concentrating on supplying cable for platforms for the Chinese market.

The leading manufacturers of umbilical cables are Multiflex, part of the Oceaneering Group and Duco, part of Technip.

Location of Cable Companies

Total number of companies with the capability of manufacturing offshore cables exceeds 100



Data: CRU

In total we estimate that there are over 100 companies around the world with the capability of manufacturing cables for the offshore market, although not all of these are actively manufacturing. Almost half of these companies are based in Asia. With a total market of under US\$250m there are clearly too many manufacturers and there is obvious scope for further industry rationalisation.

Trends in Cable Design

- Typically offshore cables are similar in design to cables used on commercial ships.
- The most common specifications are based on either IEC or British and Norwegian standards, with IEEE standards used in North America.
- The use of low smoke cables is standard in accommodation modules as is the use of zero halogen cables in designs following European rather than North American practices.
- There has been a move to reduce the thickness of the insulation on offshore cables, but true thinwall designs are rarely used
- Limited use of fibre optic cables

Like much of the rest of the cable industry the rate of technological change is relatively slow. The offshore environment is relatively harsh and the potential penalties in lost production and cost for cable failure very high. Consequently customers are quite conservative in relation to introducing new designs.

Offshore cables primarily evolved from shipwiring cable designs. In Europe the most common basis is either British or Norwegian standards reflecting the strong influence of these countries when the North Sea region was developing. Both of these standards are closely related to IEC standards. In North America IEEE standards are most commonly used. Many of the main specifiers have their own specifications but these normally only vary slightly from the national or international standard on which they are based. In order to save costs there is a trend to use more standard 'high quality' shipwiring cables.

The offshore industry was one of the leading sectors in the introduction of low smoke cables and these have been standard for many years in areas where smoke in a fire is a hazard, such as accommodation modules. In European influenced specifications the low smoke evolution is usually combined with zero halogen characteristics, whilst North American influenced specifications do not have this requirement. For certain cables oil resistance is an important requirement.

Since space and weight are important issues, one of the main focuses for offshore cable development has been to reduce size and weight. Insulation thicknesses have been reduced to make cables smaller and lighter, but although some companies have tried to sell true thinwall cables to this sector, the cost and the need to introduce new specifications and long term reliability testing means that these cables have not gained any widespread acceptance.

Because of the very harsh environment in many offshore installations it is common to use armoured cables. There has been some limited introduction of unarmoured cables in protected locations but reliability of cables remains a top priority.

Fibre optic elements are commonly incorporated in sub sea cables, but the use of fibre optic cables on topsides is limited with copper still the prime medium for communication cables.

Summary

- The high oil price has led to growing demand for offshore cables
- In mature regions the growth in importance of smaller fields means that demand for new large platforms is falling
- New oil finds are tending to be in deeper waters leading to more floating production systems
- The greatest market growth for topside cable is in Asia
- The greatest growth in demand will come from the sub sea cable sector.

To summarise, the rise in the price of oil has led to a growth in demand for offshore cables, although the close relationship between the oil price and the number of rigs is breaking down. Traditionally the largest markets for topside cables have been in Europe and North America, but the fields in these regions are now mature and demand for large platforms, which consume substantial amounts of cable, is falling. The main growth potential is in such regions as Asia, South America and Africa. A further impact on cable demand is the fact that many of these new fields are in deep water. This means that there will be increasing use of floating platforms. Since yards in Asia are being most successful in winning orders for floating platforms then this will further increase the shift in cable demand to this region.

The greatest potential for market growth is in sub sea cables. Here growth will outstrip the demand for topside cables.

In the longer term there will be increasing use of sub sea well heads and greater tie back distances could pose an increased threat to the market for topside cables. There is talk of tie backs of 200km or more which could reduce the need for large platforms and their associated cables. We are not suggesting that the market for topside cables will disappear, but even a continuing high price of oil may not be enough to sustain the market at its current level in the longer term.

In conclusion, with the price of oil remains looking like it will remain high, there are some good opportunities for growth in the market for offshore cables, but to take advantage of this, cable manufacturers will need to adapt to the changing market characteristics.

Thank you