A Bellville Rodair International transformer move by road.

Non-renewables keep a grasp on power

Non-renewable energy plants will continue to supply the bulk of the world's power for the foreseeable future, with particularly strong demand from developing nations. Phil Hastings reports on prospects in the non-renewable power sector and the opportunities they are providing for the heavy lift sector.

Following a brief flickering of the lights during the worldwide financial crisis and economic recession of 2008/09, prospects for the global power generation industry are already looking brighter, if not yet radiant.

Energy industry sources indicate there has been a pick-up in electricity demand this year, although to varying degrees in different parts of the world. Similarly, forwarders and carriers involved in power plant projects report a recent increase in requests to tender, but suggest actual new business is still rather patchy.

Longer term, though, there is a general consensus in all quarters that the outlook for the global power generation sector – and related new plant/refurbishment projects – remains very strong, with ever-rising global demand for electricity likely to drive continuing large-scale investment. That positive picture, it is suggested, applies to developments involving plants fuelled by non-renewable resources such as coal, oil and diesel, gas and nuclear, as much as it does to currently generally higher public profile schemes involving wind, solar and other renewable energy sources.

According to the US Energy Information Administration's (EIA) International Energy Outlook 2010 report, published earlier this year, total world net electricity generation is in fact set to increase by nearly 90 percent in the period 2007-2035, from 18.8 trillion kilowatt/hours to 35.2 trillion kilowatt/hours. "Although the recession slowed the rate of growth in electricity demand in 2008 and 2009, growth returns to pre-recession rates by 2015," it predicts.

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>
> – International Energy Outlook 2010

The report goes on to suggest that the growth in demand for electricity will be fastest in non-Organization for Economic Cooperation and Development (OECD) countries "where a large amount of potential demand remains unmet". Specifically, total net generation in non-OECD countries will increase by 3.3 percent per year on average, compared with 1.1 percent per year in OECD nations.

Coal power growth

Regarding the fuel sources employed to generate electricity, the EIA report concludes that while the fastest growth worldwide in the period 2007-2035 will involve the use of renewable resources, projected to increase by an average of three percent a year and increase their market share from 18 percent to 23 percent, the second fastest annual growth rate, around 2.3 percent, will be seen in the coal-fired generation sector.

During the same period, it adds, generation using both natural gas and nuclear

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– Luc Van Heygen (left), BDP Project Logistics

power (see page 89) will increase by about two percent annually.

Leading project forwarders also believe that power plants fuelled by non-renewable resources will continue to play a major role in what will be a very mixed pattern of global electricity generation for the foreseeable future.

Europe

"In both 2009 and 2010, Europe added more power capacity from renewable sources than from conventional sources like coal, gas and nuclear. On the other hand, the German government recently decided to extend the licences of the country's 17 nuclear power plants until at least until 2040," pointed out Martin Gruber, executive director of Italian project forwarder Gruber Logistics, which specialises in the transport of transformers, but whose recent projects also include the relocation of a nuclear plant spare parts depot.

"It is a fact that the energy need all over the world is increasing, particularly in countries with strong economic growth like China or India," continued Gruber. "Wind, water and solar power are going to be even more important in the future than they are today, but for the next few years there is no getting around the fact that non-renewable fuel, and especially nuclear power, will be a key component of the energy market."

The growing worldwide interest in the nuclear option as part of the longer-term solution to meeting

Gruber Logistics moves a transformer by road.

energy needs, while continuing to invest in new fossil fuel plants to meet shorter term requirements, is particularly apparent in India. There, the government has decided that around 21 nuclear power plants should be built within the next decade.

Meanwhile, various private companies are building new coal-fired power stations that will use lower-emission coal imported from Australia.

India

"Work on four or five of the new coal-fired plants has already started, and some of the project work connected with those should start coming through at the end of this year and early next," reported Malay Pota, vice-president, business development projects, for Indian project and general forwarding company Express Transport, which regularly handles heavy lift power plant equipment moves for manufacturers like ABB, Alstom, Siemens and Larsen & Toubro. "RFQs (requests for quotation) relating to project forwarding work for the first three or four of the planned new nuclear power plants are expected to start coming through next year."

Longer term, confirmed Pota, nuclear will overtake coal in terms of importance as an energy source for generating electricity in India. "The power plant sector as a whole, including the renewables side, will be a sunshine sector for the heavy lift and project forwarding industry in India for at least the next two decades," he added.

I recently saw a report that one major wind turbine manufacturer already had its output fully booked until 2016. So even if you placed an order now, the delivery date would be 2017.

– Jawad Kamel, Advance International Transport

China

A similar picture was painted by Leo Ge, managing director of Chinese project/general forwarder and logistics provider Global Star Logistics, who suggested that in fast-developing countries like China, where there are already power shortages in some areas, the solution had to involve building additional power plants using a mixture of old and new energy.

"While 'renewable' is the buzz word when it comes to the type of energy source for new power plant developments, and that sector is definitely a source of business for the heavy lift and project forwarding industry, so too is the 'non-renewable' market," stated Ge. "There are a lot of projects around for coal-fired stations and cheap energy generation in developing countries – the World Bank, for example, is spending billions of dollars on projects like that

in the Indian sub-continent and Africa."

Jawad Kamel, president and chief executive of Advance International Transport, a project forwarder with an operational base in Turkey, which last year handled four power plant projects including one for Turkmenistan (gas-fired), said another factor influencing the choice of fuel source for power generation in many countries is the local availability of particular commodities.

"Turkmenistan, for example, has a lot of gas and if they do not use it to produce electricity then they have to burn it. They cannot ship the gas on to other countries, but they can sell the electricity it generates via international power lines to neighbouring countries and as far as Romania and Bulgaria. So wind power would not be an answer for Turkmenistan because they would have to invest a lot of money in that, while at the same time burning their gas," explained Kamel.

Demand growth

He also suggested that the urgency of demand for additional power in many parts of the world is outstripping the availability of greener technology such as wind turbines.

"I recently saw a report that one major wind turbine manufacturer already had its output fully booked until 2016. So even if you placed an order now, the delivery date would be 2017 or 2018. But if you needed additional electricity urgently, you could, for example, buy gas turbines in Europe or the USA with a delivery time of only 10-14 months."

As far as the current market for project and heavy lift business relating to the building or refurbishment of power generation plants using non-renewable fuels is concerned, senior logistics industry executives generally report an improving picture.

"A year ago, quite a few power plant projects were being put on hold both by governments and private organisations," agreed Thomas Bek, business development manager for the oil and energy division of Danish forwarder and freight transport provider Blue Water Shipping, whose recent projects include handling "the biggest and heaviest" piece ever moved in Greenland, a unit required for the expansion of a diesel-fuelled power plant in that country.

"Now, though, while financing is still a big issue in many cases, it does seem like more projects are coming through. We are certainly currently tendering for quite a few projects involving power plants fuelled by non-renewable resources, and we have high

BDP Project Logistics moves a gas-fired turbine for a power plant from California to Colombia, USA.

Electrical panels being dismantled and packed by BDP Project Logistics .

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– Martin Gruber, Gruber Logistics.

hopes for that sector in 2011."

Philippe Somers, senior vice-president, industrial projects for French organisation Geodis Wilson Networks, said the impact of the 2008/09 economic crisis had not been felt so much in 2009 because of ongoing projects.

"However, because of the crisis there were no tenders to be won in 2009, so when the existing projects dried up in the first half of this year there were not many new ones in the pipeline. As a result, power plant project business has been slower in 2010," he reported.

"The good news, though, is that in the fourth quarter of 2009 and the first half of this year we saw many more tenders being put

Resurgent interest in nuclear

Anticipated rising prices for fossil fuels, and an acceptance that power generation using renewable resources will not come fast enough or on a sufficient scale to meet future energy demands, is encouraging a worldwide resurgence of interest in the nuclear option.

"Around the world, nuclear generation is attracting new interest as countries seek to increase the diversity of their energy supplies, improve energy security, and provide a low-carbon alternative to fossil fuels," confirms the US Energy Information Administration (EIA) in its International Energy Outlook 2010 report.

"Higher future prices for fossil fuels make nuclear power economically competitive with generation from coal, natural gas, and liquid fuels, despite the relatively high capital costs of nuclear power plants. Moreover, higher capacity utilisation rates have been reported for many existing nuclear facilities, and the projection anticipates that most of the older nuclear power plants in Organization for Economic Cooperation and Development (OECD) countries and non-OECD Eurasia will be granted extensions to their operating lives."

Goodisman: an international Transportation Index is used as a measure of the radiation around any particular piece.

Such trends have implications for project forwarders and heavy lift carriers in that the movement of potentially radioactive equipment, by whatever transport mode, tends to create additional operational, environmental, and sometimes political challenges.

"Nuclear is always a little more politically sensitive and so that makes our activities in that context a little more specialised," agreed Philippe Somers, senior vice-president, industrial projects, Geodis Wilson Networks.

"For us, heavy lift is heavy lift, and the sites involved are more or less the same as for other types of power plant. However, if nuclear-related equipment is involved you do need more government documents to allow importation. There are also transport permit issues."

Somers: nuclear is always a little more politically sensitive and so that makes our activities in that context a little more specialised

Michael Goodisman, business development manager for Ruslan International, which markets An124 freighter capacity, said that when it comes to the transport of radioactive components by air, an international Transportation Index is used as a measure of the radiation around any particular piece.

"Measurements are taken prior to the flight to make sure the items are at a safe level and meet the requirements of all the countries on the flight path, including the point of loading, point of offloading, and points of over-flight," he stated.

"There are a lot of requirements from all of those countries that you have to take into account and detailed discussions which have to be had. So you have to allow longer for the flight planning process – to be on the safe side, you have to allow at least four weeks because sometimes you have to use diplomatic channels for those discussions."

out. We have been awarded some jobs that are going to start ticking up in the fourth quarter of this year and more so in 2011."

David Dines, business development manager, central Europe, for multinational forwarder Bellville Rodair International (BRI), highlighted an apparent recent upturn in the non-renewable energy plant refurbishment market. BRI is still very involved in this market, although it tends to focus on renewable resource-fuelled power plants when it comes to new construction projects.

Refurbishing

"Most of what we now do in the 'non-renewable' power generation sector involves the refurbishing of old plants, primarily oil and gas-fired units. A lot of the big international plant manufacturers like Alstom have contracts where they renew the equipment after 20 years, so they are doing business all over the world where plant needs to be refurbished," explained Dines.

"Some of our customers are currently looking at markets like Russia, for example, where they are in the process of signing contracts for renewing oil and gas-fired power plants. In fact, Russia is now one of the big markets for power plant refurbishment."

Russia was also mentioned as an expanding market for non-renewable resource power plant projects by a senior executive with BDP Project Logistics, a wholly-owned subsidiary of US-based global logistics firm BDP International, but more in the context of new construction.

"Over the last two or three years we have seen growing demand for new non-renewable sector power plants in Russia, mainly gas-fired, and have been involved with the movement of transformers," reported Luc Van Heygen, the company's managing director, Americas and Europe. "Just in the last couple of months, we have become involved with some new power plant projects in that country."

A lot of plants in that country (Iraq) are being refurbished with new transformers and transmission lines.

– Virendra Sehgal, BDP Project Logistics

Opportunities

On the plant refurbishment front, he suggested that central/eastern Europe looked set to become a significant market for future project logistics business. "Two years ago there was a lot of talk about the need to refurbish non-renewable resource fuelled power plants in that region, but the actual execution of those plans seems to have been put on a low burn, probably because of the global economic crisis. The plans are still on the books, though, and those developments are going to happen over the next few years."

Virendra Sehgal, BDP Project Logistics' regional director, Middle East, singled out Iraq as another particularly strong market for non-renewable sector power plant refurbishment projects. "A lot of plants in that country are being refurbished with new transformers and transmission lines," he pointed out. HLPFI

A power plant transformer being moved by Ruslan International.

The challenges of flying extreme weights

Transporting transformers by air requires both specialist planes and specialist skills, writes Phil Hastings.

While most power plant equipment is moved by sea and/or road, there are occasions when either the urgency of the shipment or the remoteness of the final location demand transport by air. As senior executives with experience of such operations explained, the sheer weight and dimensions of larger power plant units can present particular challenges.

"Transformers are very heavy and dense. You have to be very aware of the central gravity point of the machinery involved and the lifting points," commented Lesley Cripps, sales manager cargo for Chapman Freeborn, the UK-based worldwide air charter company which recently flew three 64 tonne transformers form Delhi, India, to Kabul, Afghanistan, using an An124 freighter.

Similar points were made by Michael Goodisman, business development manager for Ruslan International, a joint venture company which manages and markets the An124 freighter fleets of its owners Antonov Airlines and Volga Dnepr Airlines.

"We can carry single pieces on the An124 of up to around 100 tonnes. Those units can be quite dense so you always try to spread it over the ribs underneath the cargo cabin floor."

To help achieve that load spread, continued Goodisman, purpose-designed skids have to be built. In that context, the height of the transformer can be an issue. "Sometimes you have to design the frame so the transformer can actually hang slightly between the rails that we use to run the units into the aircraft in order to get it as close to the cabin floor as possible."

Moisture problems

Weight and density are not the only issues associated with moving large power plant equipment by air. Goodisman explained that in the case of transformers, one of the challenges is preventing moisture getting into the units during transportation. There are two options, he said.

"You can leave the transformer's own oil inside during the transportation, or fill it up with an inert gas and connect it to some sort of high pressure cylinder. If you go down the high pressure cylinder route, you have to be aware of pressure changes in the aircraft cabin and keep an eye on pressure differences inside and outside the transformer during the flight."

Chapman Freeborn's Cripps pointed out that air cargo operators also have to make sure all such movements are in line with International Air Transport Association (IATA) regulations covering the transport of dangerous goods. "So obviously we make sure our clients are aware of what is required when they are bringing the equipment to us," she added. HLPFI

Chapman Freeborn moved three 64 tonne transformers from Delhi to Kabul by An124. One of the transformers is seen here.