

EXECUTIVE ROUNDTABLE

BY MIKE RHODES



Editor's Note: *Diesel & Gas Turbine Worldwide* invited top executives from large-horsepower, prime-mover OEMs to give their views on what the future holds for their companies and the industries they serve. It is our goal for this feature to provide a macro view of the challenges and opportunities facing the marketplace today. *Diesel & Gas Turbine Worldwide* expresses its sincere thanks to the following participating executives for their time and insights:

Dr. Roland Fischer, CEO, Fossil Power Generation Division, Siemens Energy

Robert Hallengren, product director, Caterpillar Marine Power Systems

Dr. Thomas S. Knudsen, senior vice president and head of Low-Speed Business Unit, MAN Diesel & Turbo

Bart Myers, product director, Caterpillar Global Petroleum
Willy Schumacher, CEO, MWM GmbH

➤ **What key factors — positive and negative — influence your growth potential, business prospects and relationships in the following geographic areas?**

South America

Myers: South America is an incredibly strong region for both our oil and gas and marine divisions and will continue to be a key area of focus. Brazil has been of particular interest with the rapid growth of their offshore sector and represents a market where we leverage the synergies between our marine and oil and gas divisions. While it represents a significant growth opportunity, Brazil also offers challenges. With the local content requirements, the total supply chain can take longer than in other global locations. For the oil

and gas division, other bright spots in South America include Argentina and Colombia in terms of shale plays and future growth.

Knudsen: For our type of business, opportunities within all sorts of transport needs arise everywhere and we pursue them where they emerge. South America certainly presents opportunities for the offshore oil and gas sector.

Fischer: South America has emerging countries with steady and dynamic development and tremendous power needs for their developing industries and people's welfare. From an OEM point of view, it is essential to be present in the markets, close to the customers and to understand their specific needs. And, last but not least, you must have the right portfolio in place.

Hallengren: Complex and specialty ships for marine and offshore applications will continue to be built in quantity globally. We will see a long-term focus on shipbuilding in Brazil to meet the needs of the offshore industry there. Continued pressure on vessel prices will keep the focus on general shipbuilding to lower cost countries.

Schumacher: We see potential in many areas of the world; the world is hungry for power. Latin America has a huge potential in our opinion, as well as some parts of Asia.

China And Asia

Fischer: Overall, Asia's growing energy demand is putting a strain on already limited resources. The region is experiencing strong sustained growth in exports and an increas-

ing domestic demand as well — the growth in domestic production has increased power demand by approximately 6 to 7%. They will be able to generate new capacity to meet existing and future demands, and technological advancements have made it possible to produce more energy from existing resources through harnessing residual thermal energy.

South Korea is one of the biggest importers of expensive LNG and one of the most active gas power plant markets. This will continue for the next few years. Other markets in Southeast Asia have similar requirements and gas is becoming more and more important as a clean and flexible fuel. These countries with high gas prices are looking for the most efficient technology.

Hallengren: China and Korea will



continue to be the world leaders in shipbuilding, although both will be adjusted in size as they reduce their capacity to be more in line with future demands, especially around cargo vessels. General shipbuilding will increase in India and Vietnam.

Knudsen: China is a growth machine for all parts of our business and products. Southeast Asia, with large populations and a rapidly in-

creasing standard of living, offers opportunities in every sector.

Myers: China is an exciting oil and gas market because the region has begun to apply drilling technology and hydraulic fracturing to tap into its extensive shale resources. With its unexplored resources, Russia is an area where we are experiencing strong growth. The potential in well service is significant and there is a great demand for land drilling, production and gas compression products. Challenges in that region include the temperature variances, managing the sheer size of the land, ample competition and brand recognition in that emerging market. There is also a steep learning curve in regards to culture, language and business relationships.

Africa And Australia

Knudson: Africa's large population and improving standard of living set the scene for an expected growth of opportunities there, which may come even sooner than expected. Australia is also important as a source for raw materials, although its relatively small population does not invite huge import and export growth in sea transporting of finished products.

Europe

Fischer: Energy systems in all regions are being transformed and diversified, and the power market is undergoing major changes driven by different regional needs: strong demand growth, availability, cost of fuel and environmental issues. Like North America, Europe has a strong need to replace the old power plants with newer, more efficient ones. These markets need environmentally friendly power plant solutions, and at the same time are subject to stiff competition not only between the utilities and IPP themselves, but also between the OEMs. Germany's energy transition is an example of how quickly the system must adapt to new challenges, leading to requirements for different technical and commercial solutions.

North America

Schumacher: The U.S. has great potential for cogeneration, but the market still has to be convinced of it. Even areas that have a mature market have a potential for our business.

Myers: North America is successfully leveraging shale gas reservoirs on a large scale. The industry has



been able to apply new technology to deliver huge amounts of new energy resources, signalling a paradigm shift from previous notions that North America would never fill its energy needs. We are driving new drilling opportunities, new hydraulic fracturing opportunities and gas compression equipment. The challenges in North America revolve around changing product lines to help customers lower owning and operating costs and environmental footprint by utilizing low cost gas-based fuel.

Knudsen: In North America, we see everything pertaining to the use of gas growing rapidly. Much of the regulatory environment leading to stricter emissions control has its origin there. This presents opportunities for us for gas engines.

What are the biggest challenges facing the large-horsepower,

prime-mover industry and what is your company doing to address these challenges?

Hallengren: The major challenge for the vessel power systems industry remains complying with global emissions regulations. Marine regulations regarding allowed exhaust emissions are now catching up with other industries. We are currently in a bit of a perfect storm in terms of emissions regulations. We cover a wide range of engine products and are currently seeing record investments to meet the numerous marine regulatory requirements being implemented. We are finishing a very extensive EPA Tier 3 product lineup while starting on EPA Tier 4 interim compliant products and are investing record levels in marine R&D.

While IMO Tier 3 legislation — a mandate in 2016 — and EPA Tier 4



do share similarities, the differences are significant and require attention to ensure compliance. The upcoming Tier 4 and IMO Tier 3 will significantly impact marine vessels as exhaust aftertreatment is required to meet these emissions levels.

Fischer: The markets are becoming more diversified and driven by

different customer/regional requirements: flexibility, efficiency, CAPEX, plant fit, OPEX, ROI, reliability, products and solutions.

There are more and more EPC players from emerging countries, leading to increased competition and price erosion of more than 20% in the last three years. We are answering this challenge by continuous cost-reduction measures, further productivity improvements and procurement savings, without jeopardizing quality. We benefit from the cost position from our selected partners in emerging countries. Also, continuous and sustainable investment in R&D leads to innovative technology and secures our future competitiveness. New products across all frames extend the installed base, which provides additional service business.

Schumacher: Repowering of older power plants and concerns over carbon emissions have increased focus on energy-efficient technologies. Utilities and end users are increasingly aware of this development and they demand the replacement of inefficient systems with newer environment-friendly power generation systems. The global emphasis on reducing pollutants and greenhouse gas emissions and improving fuel conversion efficiency has moved cogeneration into a strong position.

Knudsen: The biggest challenge is the environmental control limitations, which we all agree are needed and which encourage compliant product development. We are comfortable with our Tier 3 NO_x control technology, and the high thermal efficiency of our large diesels secures low fuel consumptions and thereby low CO₂ emissions.

Myers: Global regulations will always be a challenge as they increase in stringency and complexity. Taking EPA Tier 4, 3B in Europe, China and even IMO Tier 3 for offshore applications into account, the wide-ranging compliance demands will undoubtedly impact product design

and development. Because of changing regulations, the demands on R&D resources are greater, requiring a significant short-term investment that will take longer to pay off long-term.

How have customer needs and expectations changed in the last five years and how has your company responded?

Fischer: Utilities all over the world are optimizing their balance sheet and rating considerations, leading to increasing IPP structure and partnering with other investors. This development leads to a higher number of financing parties, individual ticket sizes and increasing financing complexity. We have developed finance concepts to reduce complexity by offering advisory and structuring, debt and equity participation for the whole life cycle of a power plant (financing, project execution, service). Customers benefit from easier access to financing and better financing conditions.

Schumacher: Cogeneration is cost-effective and well suited to a



variety of distributed generation applications. The technology and skill required for setting up a CHP project is commercially available.

End users of utilities and participants in the industrial segment are moving towards greater use of CHP. Production facilities require a quality, reliable power source; cogeneration could be the answer to meeting that demand in the short-term. Advancements in technology and R&D lead to the availability of smaller plants with reduced costs, reduced emissions and greater customizations. Tri-generation — the conversion of fuel into electricity, steam or hot water and chilled water — is gradually gaining focus. Improving energy efficiency is an attractive option, especially as low-carbon natural gas is the typical fuel of use across most industries.

Hallengren: Customers are much more global in their operations and expect the same consistent product support and service for their vessels regardless of how remote the location. To meet these requirements, Cat has implemented highly focused programs to certify our global dealer network's service levels, and increased corporate training and support offerings to our dealers and technicians, providing them with the tools to continuously improve.

We implemented a warranty extension on Cat parts for marine applications, created a Marine Resource Center to provide customers access to engine performance optimization resources, and now offer value-based solutions such as bundled repair solutions.

Knudsen: They expect and continue to get very high reliability, increased efficiency, reliable and available service, and regulatory compliance with our products at reasonable investment costs. One thing that has changed is slow steaming, so we have developed a wide variety of retrofit products to assist ship owners. Turbocharger cutoff has been very popular in reducing fuel consumption. Auto-Tuning and Alpha Lubricators are offered as a way to cut the fuel and lube bill of existing ships. Also, they now consider retrofitting to LNG or LPG.

Myers: One of the biggest changes has been the trend and transformation from diesel to gas engines, which incurs increased short-term costs. Customers now expect a bigger, faster payback and one of the ways to accomplish that is through lower cost fuel. We have adapted by introducing our dynamic gas blending kits that adjust to changes in incoming fuel quality and pressure, allowing engines to run on a wide variety of fuels, from associated gas to vaporized LNG, with no loss of performance integrity.

What do you consider to be key market indicators/emerging trends and how are you mobilizing your own business to address them?

Knudsen: We get inspired by key market indicators and predictions made by others as well as our own. As our products are manufactured by licensees in different parts of the world



Dr. Thomas S. Knudsen
senior vice president and head of
Low-Speed Business Unit
MAN Diesel & Turbo

where the economic development is not always the same, we are basically always mobilized. For the same reason, we can never hold back the development side and must remain at the forefront to make it possible for licensees to grasp opportunities when and where they arise.

Hallengren: The major trend we

see is the desire to move to burning of gaseous fuels and LNG in marine applications, which will grow as the availability of LNG fuels to ships increases. The lower fuel costs of LNG, the requirement to move to higher-cost, low-sulfur diesel fuels, and the ability to eliminate the need for exhaust aftertreatment all make LNG a fuel source for the future. We are introducing a full line of medium-speed, dual-fuel engines, and investing significantly to provide industry leading engine efficiency and technology, including a full line of spark ignited engines now available for marine use.

Schumacher: The long-term electric power business perspective is very good, and gas-powered power generation is in an especially beneficial position.

Short-term, there are a lot of uncertainties related to global markets and the world's financial scenario as a whole, which make any predictions very difficult.

We have a long-term growth plan that we will carry out with all eventual necessary adjustments.

Fischer: Gas is the fuel of choice for power generation in the 21st century. The world gas reserves are growing substantially due to new unconventional gas reserves and discoveries in the U.S. and around the world, consequently leading to moderate price development within the next decades. Combining this with its other advantages — low carbon footprint, high flexibility, low CAPEX, etc. — makes gas the fuel of choice. Our business model and product portfolio are perfectly in line to meet these requirements, ranging from products to full turnkey, open-cycle to combined-cycle solutions, and pure power generation to combined heat and power solutions.

Industry-wide, what recent developments — technological, economic, regulatory or other — do you think will have the greatest impact on business in the next year or two?

Myers: From a technology perspective, the ability to apply hydraulic fracturing to shale gas and oil applications outside North America will inevitably impact the industry in the near future. Everyone will also be paying attention to potential legislative changes in regards to hydraulic fracturing in Eastern Europe, which could significantly shape the global market. If China or Eastern Europe fully embraces fracking, we could have another North America phenomenon on our hands.

Schumacher: Of the various developments, I'd emphasize one in particular: the price and availability of natural gas. The overall natural gas resource base is already very large and is increasingly widely distributed; unconventional gas resources, including coal bed methane and shale

gas, are now about equal to conventional natural gas resources. Global gas trade is increasing rapidly, both in new continental pipelines and LNG. The impact of this is that prices will increasingly converge. Another key trend is the increased use of gas engines in place of diesel engines due to heightened environmental concerns and the lower costs.

Fischer: Abundant gas resources will lead to moderate price development within the next decades. The gas power generation business is a great business for Siemens Energy with a great market with solid growth opportunities. We have a unique and sustainable business model, the technology leadership and the right product portfolio in hand.

Hallengen: The move to LNG will be one of the largest transformations

the marine industry has ever seen. This has a significant impact on ever-changing vessel design and safety as new methods arise for managing and bunkering LNG on board vessels. There will be major investments into the infrastructure to provide the fuel. The speed with which the industry can put this in place will be the largest factor in when and how many future vessels will be fueled by LNG, for both new builds and retrofits when technically possible.

Knudsen: Emissions control and regulation is simply the main driver of development. A shift towards wider use of gas at the expense of oil will happen, but it is anybody's guess how fast it will happen. Tier 3 is less than 1000 days away and this will in the short-term have the biggest impact on how ships will be built and operated. 🍷