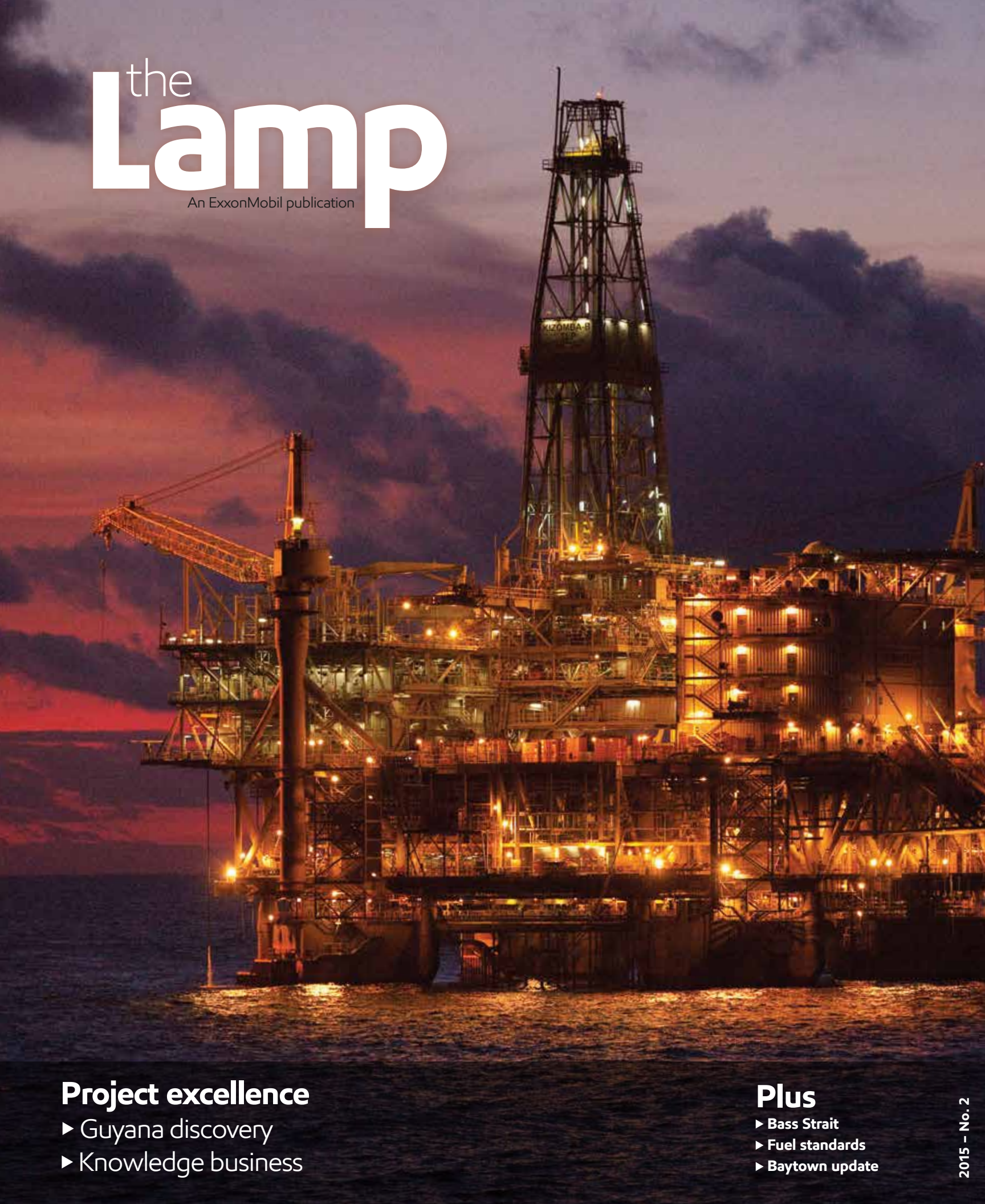


the Lamp

An ExxonMobil publication



Project excellence

- Guyana discovery
- Knowledge business

Plus

- Bass Strait
- Fuel standards
- Baytown update

The mosquitoes are losing.

With operations around the world, the fight against malaria is our fight, too. That's why ExxonMobil provides organizations with the resources to fight the disease, having reached more than 100 million people worldwide and helped with a global effort that has reduced the number of deaths by nearly 50% since 2000. We're committed to helping our partners make a difference — until the battle is won.

ExxonMobil

Energy lives here™





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excellence**

Photo by Robert Seale



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**the
Lamp**

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► **Upfront**

In May of this year, an ExxonMobil team of explorers and drillers successfully brought in the Liza 1 well 120 miles off the coast of the South American nation of Guyana. Liza is a true frontier wildcat well – a significant discovery, and the first drilled on a block spanning 6.6 million acres. The story of how technology, talent and experience brought about a great outcome begins on page 15.

Continuing this issue's focus on the challenges of exploration, on page 9 is an in-depth interview with Steve Greenlee, president of ExxonMobil Exploration Company. Greenlee discusses, among other topics, the company's integrated approach to adding high-quality

resources, and how we derive maximum value from them.

Beginning on page 5, our cover story features an interview with Jim Flood and John Plugge, vice presidents with ExxonMobil Development Company. In the article, they describe how ExxonMobil safely and consistently completes complex oil and gas projects faster and at a lower cost than its competitors.

Most drivers know that the gasoline and diesel fuel that we put in our vehicles contains ethanol. But what many don't know is that the Environmental Protection Agency has raised the ethanol portion of motor fuel above the current 10 percent

standard. The new rules could create significant problems, and a story on page 13 provides details.

A profile of the work specialized ExxonMobil procurement, real estate, information technology and other teams conduct to support our operations in remote areas starts on page 21. Plus, Delivering information (page 25), Bass Strait update (page 29) and Mobil 1 in Singapore (page 34).

We hope you enjoy this issue of *The Lamp*.

Bob Davis
Editor

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Bipartisan efforts at just the right time

By Rex W. Tillerson
Chairman and CEO of Exxon Mobil Corporation

► Evidence continues to show that the U.S. economy is struggling. And economists from across the ideological spectrum have rightly observed that by historic standards, this is one of the weakest U.S. recoveries on record.

But even in the midst of anemic growth and falling labor-force participation rates, one sector continues to power forward: America's chemical industry.

The reason for the resurgence is well known: Vast new supplies of natural gas flowing from U.S. shale deposits have given American chemical manufacturers a global advantage.

The response from the industry is a flurry of activity that could reap benefits for decades to come. Chemical manufacturers

have announced approximately \$150 billion in investments.

The chemical industry is building new plants – and retrofitting others to leverage U.S. natural gas. The data on nominal construction spending shows construction spending by the chemical industry increased nearly 140 percent from June 2014 to June 2015, with the growth rate exceeding 150 percent in the first half of this year alone.

Investments and jobs

If all of the industry's investments move forward, they will create nearly \$300 billion in new economic output and lead to more than 400,000 new jobs. The investments would also lead to \$21 billion in permanent

new federal, state and local tax revenues by 2023.

But the future successes of the shale revolution and America's manufacturing renaissance are not forgone conclusions.

We need policies equal to this historic opportunity.

The good news is that the chemical sector may be getting some timely assistance from a rare instance of Washington bipartisanship.

Democrats and Republicans in Congress have come together in an effort to modernize the Toxic Substances Controls Act (TSCA), the outdated regulations affecting the chemical industry. The proposed reforms will help bring 1970s legislation into the 21st century.

It's taken years of bipartisan work and negotiation, but these changes are just the comprehensive overhaul we need.

Just as important, these bipartisan efforts appear to have an excellent chance of succeeding. The reform is drawing impressive support from the industry, building trade unions and organizations including the Environmental Defense Fund, National Wildlife Federation, March of Dimes and U.S. Humane Society.

Modernization

By modernizing the regulations governing the chemical industry, we can strengthen and clarify the role of government in overseeing and protecting public health. The proposed reforms would provide



a better system for the Environmental Protection Agency to evaluate risks of both new and existing chemicals using the best available science. This will give the public confidence in the safety of the chemical products used every day.

Regulatory modernization will also help strengthen and sustain America's role as a leading innovator for chemical products – an area that drives 25 percent of the U.S. economy.

To borrow a phrase from Daniel Yergin, plastics and chemical products are “the bricks and mortar of contemporary civilization.” They are found in 96 percent of manufactured goods – from lifesaving medical devices and personal technologies, to

food packaging and storage, to building materials. Chemicals are vital to making the world safer and healthier. They are also critical to using energy more efficiently, as well as helping us minimize mankind's impact on the environment.

But over the decades, the regulatory landscape for the U.S. chemical sector has been mired in complexity and uncertainties because of anachronistic Washington rules.

Broken system

The TSCA has made it difficult to greenlight innovations or effectively calculate the costs of various policy options. Because the federal legislation is so out of date, this system is not working. In the face of this dysfunction and ambiguity

in Washington, a patchwork of state and local laws now exists – further complicating interstate commerce and the industry's investment decisions.

Thanks to the efforts of leaders from both parties in Washington, we can look forward to clearing away that clutter and enacting reforms that bring clarity, certainty and consistency to America's dynamic and vital chemical industry. With these reforms, parents in every state can be confident that their children are adequately protected from any risks, while manufacturers from New Jersey to California will have the regulatory certainty they need to continue to innovate and create jobs.

TSCA modernization passed the House this summer with over-

whelming bipartisan support. And in the Senate, a coalition of both Democrats and Republicans are pushing similar legislation across the finish line in the hopes of sending a final bill to the president's desk.

Those in Congress who are working together to modernize TSCA regulations deserve credit. They are acting in the best interests of our economy and our environment. They are also setting an example for modern Washington – building bridges across parties to act with wisdom and common sense.

It is a moment for which we can all give thanks – and which should guide the efforts of our elected leaders and policymakers in the future. [theLamp](#)

A reputation for excellence

John Plugge, vice president of project management and execution; and Jim Flood, vice president of arctic and eastern Canada, discuss how ExxonMobil Development Company leads the industry in project execution.

► **ExxonMobil has become recognized for completing oil and gas development projects faster and at a lower cost than its competition. Why is that?**

Plugge: The underlying reason dates back to Exxon's decision before the merger with Mobil to establish one upstream company that was all about project management. That move reflected the corporation's anticipation of significant growth in the number and size of development projects around the world, including many in higher-cost environments. Rather than the traditional model of carrying out development through affiliates, Exxon foresaw the efficiencies of having one organization consistently and flexibly deploying its expertise wherever needed.

How has the company advanced its reputation for project execution since the merger?

Plugge: First, ExxonMobil Development Company (EMDC) has had the benefit of working with the industry's largest and most diverse portfolio of projects. Our portfolio contains more than 120 projects to develop 24 billion

oil-equivalent barrels representing conventional and unconventional oil and gas, heavy oil, and liquefied natural gas (LNG) around the globe. This diversity has allowed us to be selective in pursuing the right projects at the right time. In addition, we have developed a structured project management system that has enabled not only performance consistency but a means for continuous improvement. Most importantly, in completing more than 100 projects over the past 15 years, we have developed a highly experienced workforce with a depth of technical and management expertise that is unmatched by our competitors.

Flood: Let me add that our project management structure focuses accountability for project execution at a regional level with the backing of one global organization that provides the people, processes and tools for those projects. Our global organization "sees the world," so to speak, and within 24 hours we can apply lessons learned from one region to another when issues occur, regardless of whether they're positive or negative. We have the ability to fly in project

experts to provide solutions to any issues. We know of no other international oil company with that capability.

What factors must you consider in early project planning?

Plugge: Among the more critical steps is selecting a leadership team that understands the technical side of the work and has the right management skills. This decision evolves out of a process by which we decide if a project will be routine, meaning that it is something we have done before, or nonroutine. Nonroutine projects tend to be bigger, more complex and require many years to complete. By distinguishing routine versus nonroutine early on, we can select the leaders and teams best suited for the project.

Flood: Based on EMDC's 15-plus years of proven, demonstrated project experience, we understand that it's critical to lock down the development concept as soon as possible. The key then is to manage each of the critical transitions, from front-end engineering to detailed design to the beginning of the construction phase so that we can resolve all major

Photo by Robert Seale



ExxonMobil's Jim Flood (left)
and John Plugge.



Photo by Richard Dellman

Execution excellence allowed ExxonMobil to start up the Papua New Guinea liquefied natural gas project ahead of schedule in 2014.

project issues before moving from one phase to the next. We have seen major projects in the industry get derailed due to a constant recycling of poor decisions, resulting in the delay of critical engineering deliverables. This can have a significant negative impact, including driving up costs and delaying project completion. We must eliminate uncertainty as early as possible to ensure that you enhance project predictability for both cost and schedule performance.

How else do you achieve better predictability?

Plugge: It's critical that we select contractors with the core competency for the work we want done. EMDC has built a global network of contractors to whom we return time and time

again for engineering, procuring equipment, fabricating facilities, hooking up modules, building ship hulls, performing pre-commissioning and other work. In particular, their learning curve has grown tremendously, especially with their participation in our design-one, build-multiple approach. This has helped us increase overall project predictability, lower costs and achieve faster project completion.

When did ExxonMobil have its first big success with the design-one, build-multiple approach?

Flood: It started with the Kizomba A and B deepwater developments in Angola. We completed Kizomba A in 2004, including installation and startup

of a floating production, storage and offloading vessel and a tension-leg drilling platform in an industry-record 34 months. We then adopted the design-one, build-multiple concept when we essentially replicated Kizomba A for Kizomba B and delivered the same scope of work in an industry-record 31 months. We have since used the approach many times, including at Sakhalin-1 in Russia and both the initial and expansion heavy-oil projects at Kearl in western Canada, as well as at our joint venture in Qatar with RasGas and Qatargas to build multiple LNG trains. We also plan to use it with the future SAGD oil sands project in western Canada and the potential Liza deepwater development in Guyana.

How does ExxonMobil's project execution benefit from new technology?

Plugge: New technology, which mainly comes from ExxonMobil Upstream Research, improves project economics and is critically important amid today's lower oil and gas prices. A good example is in Canada, where we could use solvent-assisted steam to produce more bitumen from our Aspen development. This new technology, along with other capital-efficiency initiatives, has significantly reduced costs.

What other competitive advantages does ExxonMobil have in project execution?

Flood: First is our disciplined ExxonMobil Capital Project Sys-



Structured project management provides efficiencies at Sakhalin-1 in Russia and other major projects worldwide.



Photo by Robert Seale

A design-one, build-multiple approach cut costs and streamlined schedules at the Kizomba developments offshore Angola.

tems (EMCAPS), that standardize our processes across all projects. Second is our structured gate process to assure that we finish work before moving onto the next phase. This approach also allows us to confirm that project risks are properly addressed and to test the economics to assure the project is well founded and meets our stakeholders' requirements for implementation. In addition, EMCAPS is our execution framework for managing the corporation's Operations Integrity Management System, through which we not only design and construct facilities with safe execution in mind but focus on their ongoing integrity and safe operation for the long term.

A third advantage is the integrated approach we take across all of our upstream companies.

Whether it's Exploration, Production, or Gas and Power Marketing, we act as an integrated upstream company and work to meet the general interest of the corporation. A great example is how we integrate production personnel into the project team before front-end engineering to provide an operational perspective all the way through the commissioning and startup phase. This one-team approach is more efficient and timely compared to industry norms, and is being extended to the concept execution phase as part of our upstream synergies effort.

Please comment on how project execution excellence supports improved safety.

Flood: Safety has been a relentless journey, with consistent

improvement since the establishment of EMDC. But people are still getting hurt. We know we need to continue to drive the value of caring about the safety of each and every person at our work sites so that we can achieve our objective of "Nobody Gets Hurt." A great example of our safety progress is Sakhalin-1 in Russia. When we started almost 15 years ago, we didn't know a lot about the safety culture in Russia. With continuous projects over this time and the application of our safety values and principles, we have seen Sakhalin become one of the corporation's safest places to work. The Exxon Neftegas Limited project and ExxonMobil Drilling teams have won a combined 13 ExxonMobil Development Company President's

Safety Awards since the awards started in 2007.

Plugge: Our safety success also comes down to the strong relationships we have established with our contractors, which have never been better. We have excellent alignment about safety and what it means for the business. Our practice of having ExxonMobil teams work alongside contractor teams in the contractors' fabrication yards and design shops has helped us achieve a leading safety performance.

theLamp



Steve Greenlee, president of
ExxonMobil Exploration Company.

A great time to be in exploration

The Lamp profiles Steve Greenlee, ExxonMobil Exploration Company president, and how the corporation is competing for the world's best oil and gas opportunities.

► When did you first develop an interest in geoscience?

Actually, my passion was to become an oceanographer. My dad, a dentist, loved getting outdoors for fishing, surfing and skiing, so we spent a lot of time on the Jersey Shore. Early on, I enjoyed reading books on just about anything that had to do with the ocean, and if you had asked me a question about coral reefs or ocean currents, I probably could have talked for hours. In planning for college, I discovered the best way to follow my passion was through geology. After obtaining a bachelor's degree in geology from Duke University, I pursued a master's in oceanography at the University of Rhode Island.

What led you to ExxonMobil?

I was writing my master's thesis on the science of seismic stratigraphy. The details of that science were invented at Exxon Production Research (EPR) under the leadership of a fascinating

geologist named Peter Vail. I met him at a conference on sea-level changes and got to see his North Sea research. I subsequently decided Exxon was the place for me.

I started at EPR in Houston in 1981, planning to eventually return to graduate school for a Ph.D. and work in academia. But we were conducting seismic stratigraphy workshops all over the world and developing lots of new concepts. It was so much fun that I couldn't believe I was getting paid to do it. I remained at EPR for 12 years.

What assignments followed?

My first full-time move out of research was a dramatic one. In 1993, the new Exxon Ventures (CIS) Inc. assigned me as a supervisor in western Siberia. I next worked in Kazakhstan before moving to New Orleans as a manager for Exxon's Gulf of Mexico production unit. After the merger with Mobil, assignments followed in Brazil, Saudi Arabia,

Texas and Asia-Pacific before I returned to research as president of ExxonMobil Upstream Research in Houston. In 2010, I became president of ExxonMobil Exploration Company.

How would you summarize Exploration's function?

Our job is to discover new sources of oil and gas that are better than what is already in ExxonMobil's industry-leading resource base, now estimated at 92 billion oil-equivalent barrels. By better, I mean they have the potential to generate a higher economic return over the life of the resource for all stakeholders. We're not just in the business of replacing what has been produced. We are after high-value opportunities.

How well is ExxonMobil positioned to carry this out?

We are better positioned than ever to identify and pursue the greatest-value opportunities. This

is partly due to how the company's resource-acquisition effort is structured today. Exploration is focused primarily on discovering new fields rather than its traditional responsibility for adding all resources to the corporation's portfolio. ExxonMobil Upstream Ventures focuses on securing interests in discovered but undeveloped oil and gas resources. The corporation's XTO Energy affiliate specializes in North American unconventional resources mainly in shale plays.

How does this provide benefit?

From a corporate standpoint, it benefits us by allowing each business line to focus on a specialized area or role. Our competitors might be good explorers, or good at negotiating acquisitions, or experts in unconventional plays. But we can pursue all three at the same time. With our three organizations working together while focused on our individual specialized roles, we are in a

stronger position to look for the most attractive opportunities.

Exploration is not a stand-alone business line. We don't drill a discovery and then sell it to someone else to develop and produce. We can apply the full breadth of ExxonMobil's industry-leading upstream organization from exploration and development through production and gas marketing, all supported by a research company that provides the latest technology. Plus we have world-class downstream and chemical businesses. This allows us to generate maximum value through the full life cycle of an energy development. This is ExxonMobil's prime differentiator, and it is a strength that is particularly attractive to host governments.

Where has the corporation had success with a full life cycle model?

A recent example is the Papua New Guinea (PNG) liquefied natural gas (LNG) project that started up in 2014. It has the potential to produce some 9 trillion cubic feet of natural gas for export to Asian markets as LNG for decades to come. ExxonMobil brought all of its upstream strengths to bear in an extremely challenging environment with minimal pre-existing infrastructure. But we have put in place the ingredients needed for a successful long-term project and a strong relationship with the government and the people of PNG. Best yet, we are still exploring for new resource opportunities.

Of course, we have established long-term relationships all over the world.

In July, we announced a significant oil discovery on a 6.6 million-acre block – about 10,000 square miles – offshore Guyana in South America (see story, page 15). We're optimistic about establishing a long-term presence in Guyana to help the nation build the infrastructure to support development of its oil and gas resources.

Switching topics a bit, how does Exploration develop its geoscience talent?

We focus on having employees experience the full breadth of petroleum geoscience, from the initial exploration concept all the way through the last barrel produced. The best geologist is the one who has worked in teams with the engineers, commercial people, gas marketers and others to learn



ExxonMobil Exploration by the numbers

- ▶ Employs about 1,000, including 650 geoscientists.
- ▶ Explores in more than 30 countries.
- ▶ Explores on 116 million acres.
- ▶ Our exploration drilling program added 2.7 billion oil-equivalent barrels in 2014, with additions from multiple resource types around the world.
- ▶ Additions from exploration drilling averaged approximately 2 billion oil-equivalent barrels per year over the last decade.

A major ExxonMobil strength is generating maximum value through the full life cycle of a development.



From left: ExxonMobil Exploration Company's Kim Begay-Jackson, Steve Greenlee, Norm Allegar and Paul Lee discuss the results of a 2015 seismic program conducted at the Sakhalin-1 project.

how to develop a superior project. Those who become technical and business leaders within the corporation will have a complete understanding of what is required to create the most value for shareholders. These opportunities are not necessarily available within many other companies.

How are lower crude oil and natural gas prices affecting exploration?

Some might think we would be significantly pulling back, as many in the industry have. While our capital expenditures are down from last year, we are well posi-

tioned to continue competing for the most attractive opportunities. We are organically growing exploration in new areas, and searching for more opportunities in established areas.

Further, we are seeing a lot more exploration prospects coming on the market. Some of these involve situations where financially constrained companies are offering attractive deals in which we can acquire an interest and help them explore their quality properties. This is particularly true in the international and deepwater sectors.

How is ExxonMobil's technology leadership keeping it more competitive?

We have capabilities to see things others can't. For example, our new full wavefield inversion technology allows us to model subsurface geology in much more detail than the industry could achieve before. And this is just one of a number of seismic-imaging technologies made possible by our industry-leading use of super-fast, high-performance computing.

ExxonMobil's technology advantage also spans the upstream to include drilling, engineering and facilities design – all


paving the way for exploration, development and production in ultradeep water.

While some of our competitors, for instance, are focusing exclusively on U.S. shale plays, our exploration opportunities span the globe, and we continue to progress into increasingly challenging areas as our technology advances.

Without a doubt, it's a great time to be in exploration. **theLamp**

Repeal the U.S. biofuels mandate

ExxonMobil supports environmental protection and policies based on sound science. But rules requiring ever-higher biofuel blends will only make a difficult situation worse.

A woman with short, wavy brown hair, wearing a black blazer over a grey dress, stands with her hand on her hip. She is positioned in the foreground on the right side of the frame. The background is a long, multi-lane highway at night, filled with cars whose headlights and taillights create a streak of light. In the distance, industrial structures like smokestacks are visible against the dark sky.

Elisabeth Vrahopoulou,
ExxonMobil senior fuels advisor.

► For nearly 10 years, the U.S. Environmental Protection Agency (EPA) has required refiners to blend biofuels into gasoline and diesel sold in the U.S. The EPA recently finalized rules that effectively raise the ethanol portion of gasoline above the current 10 percent level. Such rules will likely create serious problems for motorists, fuel retailers and refiners, with no benefits for the environment.

The EPA's biofuels regulations are part of a renewable fuel standard (RFS) first legislated by Congress in 2005 and amended in 2007. The RFS was primarily intended to improve energy security based on two key assumptions: that annual U.S. fuel consumption would continue rising indefinitely and that domestic oil supplies would be insufficient to meet that rising demand.

Both assumptions are false. Gasoline demand actually decreased since lawmakers enacted the legislation, driven by the 2007 recession and reduced consumption brought about by the replacement of older, less fuel-efficient vehicles with newer ones. In addition, domestic oil and gas production is up dramatically due to technological advances. The United States is now the world's leading energy producer.

E10 blend

Nearly all gasoline sold today in this country contains up to 10 percent corn-based ethanol. This blend, known as E10, is not harmful to vehicle engines. How-

ever, that's not true for higher-percentage blends. Ethanol is corrosive and attracts water. Testing such as that conducted by the Coordinated Research Council has shown that damage to engine seals, hoses, fuel systems and exhaust systems can occur when ethanol content in fuel rises above 10 percent. This applies to cars, trucks, motorcycles, boat engines, lawn mowers, snowmobiles and other gasoline-fueled engines.

"The majority of vehicles on the road today are designed and warranted for fuels up to E10," says Elisabeth Vrahopoulou, senior fuels advisor for ExxonMobil Refining and Supply Company. "It is estimated that less than 15 percent of the cars and light-duty trucks are designed and warranted for blends containing more than 10 percent ethanol. In fact, auto manufacturers have unanimously advised consumers not to use higher ethanol blends like E15 in vehicles unless the owner's manual specifies such fuels. The use of fuels with higher than 10 percent ethanol can void vehicle warranties."

Over the years, some manufacturers have offered "flex fuel vehicles" (FFVs) that can safely use higher ethanol blends, including E85, which contains as much as 83 percent ethanol. But ethanol has lower energy density than gasoline and yields fewer miles per gallon. The market availability of E85 is limited because any retailer offering it must install expensive storage and handling

ExxonMobil clean fuels research

Our Corporate Strategic Research laboratory and ExxonMobil Research and Engineering Company conduct an array of programs designed to study future transportation fuels and engines. Biofuels research includes collaborating with Iowa State University on using heat to convert biomass into intermediates, which can then be upgraded into fuel, and research involving advanced biofuels from algae.

Other important programs include the study of advanced technologies for increasing fuel economy by separating fuel into high- and low-octane streams, which the engine can use to optimize fuel economy during driving.

systems to keep E85 separate from other fuels. According to the Petroleum Marketers Association of America, "... FFV owners are choosing to fill up with gasoline due to its 27 percent higher energy content and superior fuel economy. Given the slim margins on retail fuel sales, retailers are forced to convert slow-moving E85 tanks back to gasoline in order to increase volume and maintain profitability. Consumer choice is the real reason E85 pumps are on the decline."

Flawed policy

Given the trend of decreasing domestic gasoline demand, it follows that U.S. refiners won't need more ethanol in the future to produce E10 fuels. Nevertheless, the EPA requires refiners to increase the amounts of ethanol they blend into their motor fuels each year. This not only increases the percentage of ethanol in motor fuel, but it ultimately exceeds the operational design standards of most automobiles.

While the EPA's biofuels man-

date for 2015 is about 17 billion gallons, that number more than doubles to 36 billion gallons by 2022. Non-food-based biofuels that could be used in place of higher ethanol blends – which the RFS envisioned – are available commercially, but in very limited quantities due to significant technological and economic hurdles.

In short, the RFS requires fuels that are incompatible with today's manufacturing technologies and vehicle fleet.

"The RFS should be scrapped, or at the very least reformed," says Ken Cohen, Exxon Mobil Corporation Public and Government Affairs vice president. "The EPA should limit its ethanol mandates to no more than 9.7 percent of total U.S. gasoline demand. That would ensure that the gasoline sold at service stations across America does not pose any threat to the tens of millions of automobile engines not warranted by car manufacturers to handle gasoline with more than 10 percent ethanol." *theLamp*

A man with a mustache, wearing a dark brown suit jacket over a light-colored shirt, stands in a tropical field. In the background, several tall palm trees are silhouetted against a cloudy sky at dusk or dawn. The overall mood is professional yet serene.

A testament to technology and vision

Company completes successful
Liza 1 well offshore Guyana.

Jeff Simons heads the company's venture
office in Georgetown, Guyana.

► The data from the well logs looked promising, and a restrained optimism began to build among small groups of specialists at the company's north Houston campus, at its Georgetown venture office, and aboard the drill-ship *Deepwater Champion* 120 miles off the coast of the South American nation of Guyana.

Kerry Moreland and a team of other ExxonMobil geoscientists had been tracking the progress

of the Liza 1 well since crews started drilling in March.

"A small team worked more than a year designing and executing a plan that had now brought us to the brink of what could be a major discovery," says Moreland, who began her career with the company in 2005 after graduating from the University of Oklahoma with a master's degree in geophysics. "The suspense and excitement continued

to grow by the hour as the drill bit approached the top of the predicted reservoir section."

While the team in Houston prepared to analyze the real-time results soon to come, Moreland boarded a flight to Guyana early the morning of Monday, May 4, to be at the well site the moment the first results came in.

"When I finally arrived in Georgetown, the drillers had just entered the reservoir section some



Photo by Robert Seale



11,000 feet beneath the seabed," Moreland says. "I was too excited to sleep, even for a few hours, and was at our helicopter base at dawn. By 9 a.m., I was aboard the ship."

By this time the Exploration and Drilling teams in Houston, as well as those on the third floor of the small Guyana venture office, felt they could be witnessing something big, as the well logs showed the intermittent presence of hydrocarbons within the target.

"We didn't know at that point what we had, since we were drilling in and out of several sands," says Jeff Simons, country manager, who transferred to Guyana in late 2014 from an assignment in Europe. "Drilling continued through the night, and on the morning of May 6, it became clear we'd found a column of hydrocarbons extending more than 295 feet. That's big, really big."

On board the *Deepwater*

Champion, Moreland and the wellsite geologists had the benefit of something else that supported the significance of the find: the drill cuttings from the reservoir itself.

"We analyzed the rock fragments in a small lab on board the ship, both for rock type and for what we call 'shows,'" Moreland says. "That analysis, along with the well logs acquired while drilling, suggested the potential for a significant volume of high-quality oil."

The Liza 1 discovery well is 120 miles offshore Guyana in 5,700 feet of water.



Photo Getty Images Inc.

Guyana at a glance

Population: 800,000, concentrated along the country's coast.

Government: Multiparty democratic republic.

Area: 83,000 square miles, about the size of Idaho.

Economy: Agriculture, timber, fishing and mining.

Languages: English (official), Creole, Hindi, Urdu, Chinese, Amerindian dialects.

Climate: Tropical, with an average temperature of 81.5 degrees Fahrenheit

Flora: Approximately 80 percent of Guyana is tropical rainforest, much of it untouched.

Biodiversity: The country has 225 species of mammals, more than 300 species of reptiles and amphibians, 815 (and counting) species of birds, and more than 6,500 types of plants.

Photo Getty Images Inc.

A longshot

The odds were against it. The Stabroek block that ExxonMobil acquired rights to explore from the Republic of Guyana is 6.6 million acres. Water depth at the site exceeds a mile. There had never been a well drilled anywhere on the block. The 22 wells drilled by other companies since the 1970s on the coastal shelf outside the southern boundaries of the block had all proved noncommercial.

"Geologically, the well was quite risky," Moreland says, "with a low probability that it would turn out to be successful. It was a true frontier wildcat well."

But she goes on to explain that the location of the Liza 1 well held particular interest for the explorers, since initial seismic data and geologic analysis of the region "suggested the presence of sediment fairways transporting sandstone reservoirs into the ba-

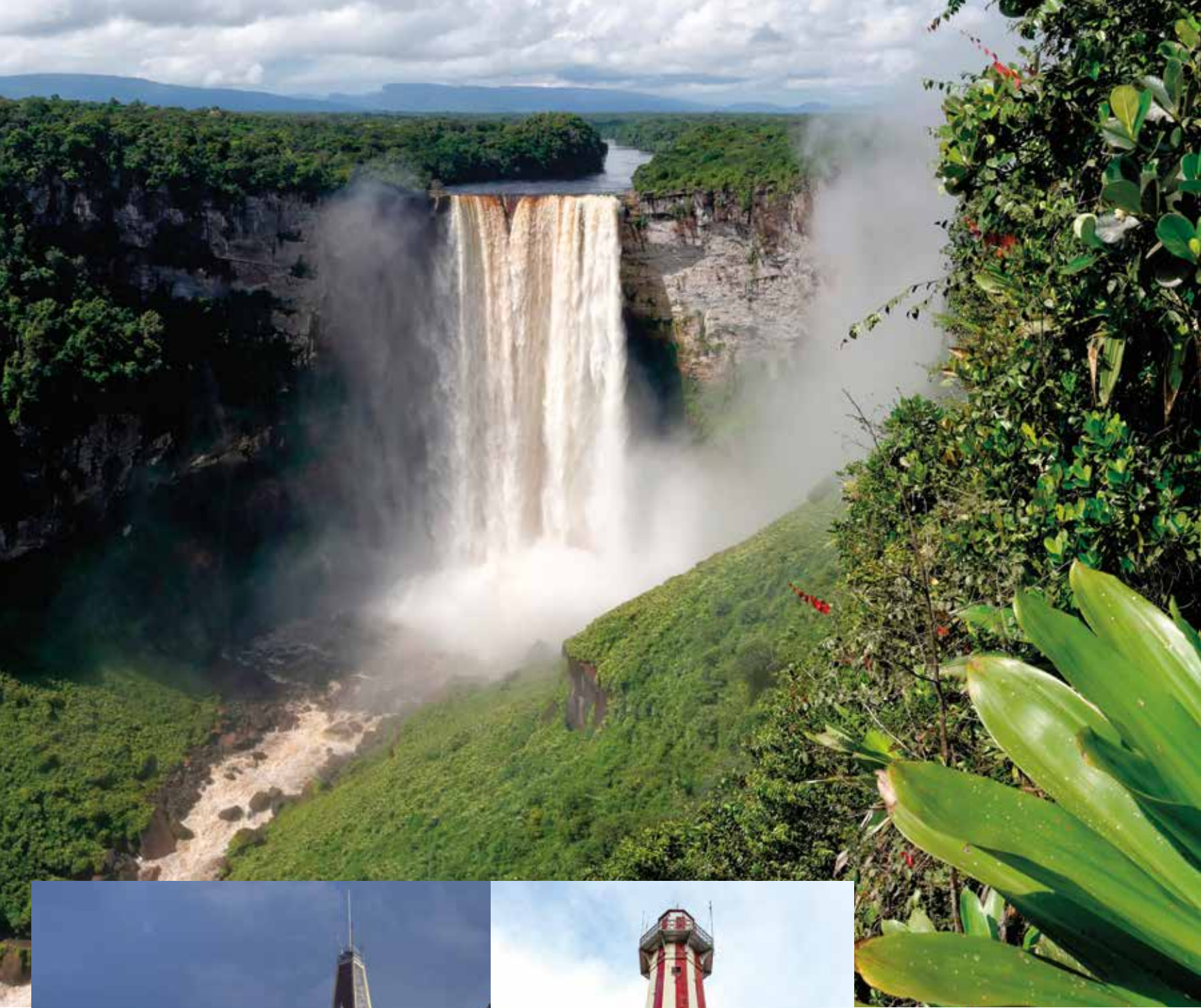
sin. In addition, oil and gas shows in previously drilled wells closer to the coast indicated a working hydrocarbon system potentially extending farther offshore into the Liza area."

Next steps

While ExxonMobil technical experts in the Exploration, Development and Upstream Research companies continue to analyze the well data and plan for

potential future appraisal drilling, the largest 3-D seismic survey in the company's history is now underway on the Stabroek block.

Two seismic vessels are acquiring data over approximately 6,500 square miles, an area comparable to the land mass of the Hawaiian Islands. The program includes two support ships that make sure that there's no interference from other vessels in the area, as well as two supply boats making regular trips



Above: Kaieteur Falls in Guyana's interior rainforest is among the highest and most powerful waterfalls in the world.

Above left: There are more than 800 species of birds in the country, including macaws and other parrots.

Left: Located at the mouth of Guyana's Demerara River, this old red and white striped lighthouse guided many ships into Port Georgetown.

Far left: City Hall, with its Disney-like spires, houses the offices of Georgetown's mayor and city council.

Photo by Robert Seale

from Georgetown and Trinidad to bring food, equipment and supplies to crews.

With support from the Guyanese government, company teams mobilized this seismic program in about six weeks after the discovery, an extraordinary achievement. The *Deepwater Champion* finished drilling and moved off location June 20, and by mid-July all permits were in place and the seismic vessels began acquiring data.

In Georgetown, the capital of Guyana, there's excitement and anticipation for what the discovery could ultimately mean for the country's future. Guyana's Minister for Governance and Spokesman for Natural Resources Raphael Trotman says that he and the other leaders of

The Liza 1 team

- ▶ Kerry Moreland, Guyana basin project manager.
- ▶ Scott Dyksterhuis, lead Liza geoscientist.
- ▶ Randy Perkey, lead block geoscientist.
- ▶ Lisa Roehl, project manager during Liza's drilling.
- ▶ Brooke Harris, commercial advisor.
- ▶ Linda Price, regional geoscientist.

Liza 1 overview

- ▶ Discovery is in a challenging frontier, unproven basin.
- ▶ Stabroek block is 6.6 million acres.
- ▶ Water depth at the Liza 1 well is 5,719 feet.
- ▶ Total well depth is 17,825 feet.
- ▶ Reservoir found in sandstone is from the Upper Cretaceous period (~70 million years old).

Scott Dyksterhuis (left), Kerry Moreland and Randy Perkey recap the drilling of the Liza 1 discovery well.



Photo by Robert Seale

Guyana Minister for Governance and Spokesman for Natural Resources Raphael Trotman says the Liza 1 discovery has brought a new spirit of hope and pride to his country.

his nation view Liza as more than simply a discovery of oil.

"For many generations, we have always believed in the potential for the discovery of oil off our shores, and in our sovereign right to produce that oil," he says. "By the same token, the Liza discovery has coincided with the election of a new government in Guyana and the upcoming 50-year anniversary of our country's independence. So we are viewing this in more than simply economic terms: it has imbued a sense of responsibility, and a new spirit of hope and pride in our nation."

Trotman goes on to say that

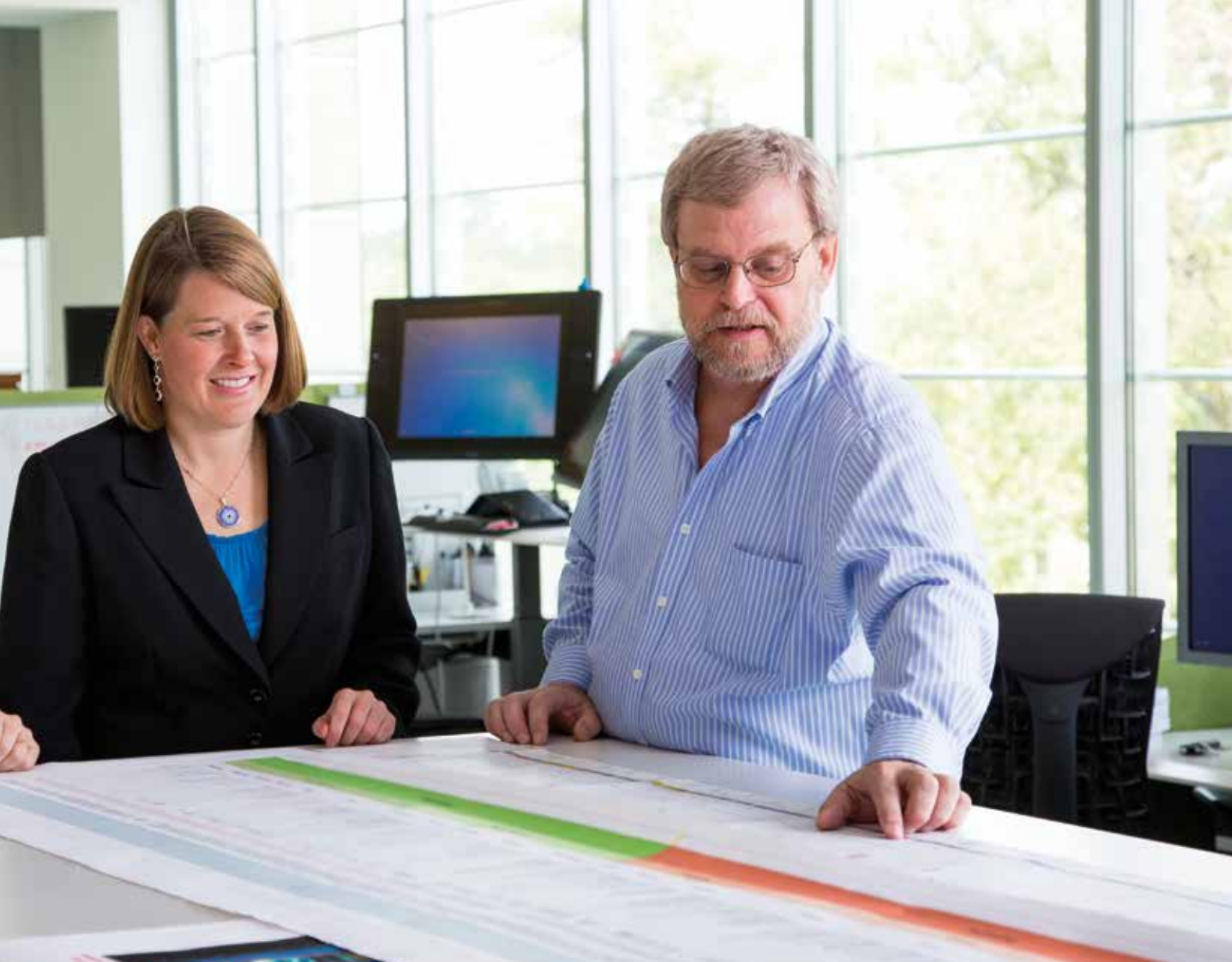


Photo by Robert Seale

if development were to occur, he views the relationship with ExxonMobil as similar to the forging of a long-term partnership. "ExxonMobil for us is more than just a company; it's more like a trusted partner who is adding value to our association ... a partner with whom we can share our vision."

Office evolution

Jeff Simons remembers when the company started gearing up in earnest a few years ago for its commitment to drill the Liza 1 well.

"The first team on the ground set up desks and phones in a

suite that Queen Elizabeth had once used during her visit to the country in 1994," Simons recalls. "Their equipment was basically a copy machine and a computer connection to Houston. Soon after I arrived, staffing grew to four employees, and we set up a transition office in a small space in an apartment building outside of town."

By November 2014, with the start of Liza drilling drawing near, the core team and several additional employees moved to larger quarters on New Market Street in the center of the city, close to various government offices and

a new hotel. More specialists in drilling; geology; computer and telecommunications support; safety, health and environment; procurement; public and government affairs and other functions have since joined the staff, which now numbers about 20 employees and contractors.

"But even as the office has grown, we operate as a close-knit team, where everyone looks out for each other and helps get things done," Simons says.

Technology and talent

Steve Greenlee, president of ExxonMobil Exploration Com-

pany, believes the success of the Liza 1 well is a fine example of ExxonMobil technology, experience and talent at work.


"We applied advanced seismic imaging and analysis; our global experience; and an integrated, well-planned approach by talented teams in Guyana and Houston to successfully overcome the uncertainties of a truly frontier well that will add valuable resources to ExxonMobil's portfolio and create great value for the nation of Guyana," he says. [theLamp](#)

Frontier support key to business success

Global Services Company provides safe,
secure offices and operations worldwide.



Jeff Marsh and Kellie Canaday are among hundreds of ExxonMobil specialists providing procurement, real estate and facilities, information technology and other essential services to remote company operations.



► When ExxonMobil announced a significant oil discovery offshore Guyana this year, behind the scenes of the successful exploration effort was a team of real estate, information technology and procurement experts.

From setting up office space, to securing equipment and contracts for operations, to building residential housing for expatriate employees in remote locales, ExxonMobil Global Services Company (GSC) provides critical support to exploration, development and production activities in frontier locations worldwide.

"We help the business focus on its core job of finding and producing oil," says Peter Sturla, Global Real Estate and Facilities (GREF) Angola project manager. "Above all, we want employees to be safe. As such, we strive to provide them with secure and comfortable office and living quarters so that they can concentrate on the jobs at hand."

Sturla is currently overseeing construction of a new 60-unit housing complex in Angola for expatriates supporting the company's upstream operations. In the past five years, he has helped build offices in Dubai and housing in Saudi Arabia and Egypt.

A team effort

Three key GSC organizations help get operations up and running, and provide safe offices and housing for employees when ExxonMobil enters a frontier

location. GREF leases or builds and manages office space and housing facilities for expatriates. ExxonMobil Information Technology (EMIT) professionals provide computing, network and telecommunications capabilities, and Global Procurement secures the goods and services to run the operations – everything from drilling equipment to pens and pencils.

Often, new exploration and production areas are in remote locations in underdeveloped countries. Office space may be limited or unavailable. Telecommunications links are nonexistent. Even roads and airports needed to get essential supplies into these areas can be limited.

"For our permanent facilities compound to support LNG operations in Papua New Guinea, the company started by putting in roads to get to our site, building power generation and water treatment plants and installing telecommunications," says Scott Clare, manager of Asia-Pacific real estate and projects for GREF.

Now that LNG production has begun, GREF has also completed construction of a state-of-the-art facility to support ExxonMobil's workforce.

The ExxonMobil Haus in Papua New Guinea (PNG) now accommodates more than 300 employees and features many of the same amenities as the new Houston campus, including adjustable workstations in an open, collaborative environment outfit-

ted with high-definition wireless projectors, 55-inch light-emitting diode displays and ClickShare presentation technology. The 72-acre site includes a recreation center for employees.

"We accomplished this in a country that has few examples of this type of advanced construction and with a workforce made up mostly of local workers," says Dave Baker, senior project manager.

First on the ground

The GSC team's involvement starts at the beginning of a project. "We're integrated with the business to understand its long-term strategy and to deliver solutions to get operations up and running," Clare says.

Today, ExxonMobil has 18 venture offices throughout the world.

The company often establishes new offices in frontier locations in a hotel, as it did in Guyana (see story, page 15).

"As ExxonMobil enters a new country and works with the government to set up production-sharing agreements, the advance team needs support and equipment from the very first day," says Jeff Marsh, who oversees procurement for drilling and exploration projects around the world.

GREF, EMIT and Procurement work together to set up offices, communications networks and living arrangements for personnel. They also work closely with ExxonMobil Security and Medicine and Occupational Health to



This 60-unit housing complex in Luanda, Angola, is nearing completion and consolidates three previous locations into one.

ensure that working and living arrangements are safe.

"Proximity to our office and a local airport is critical in selecting a housing location," Sturla says. "In developed locales, we look for housing that's already built. Here in Angola, we're consolidating current housing into a new compound of three-bedroom houses."

While GREF handles work and living arrangements, the Procurement team develops contracts and secures suppliers. "Often, there are limited suppliers to choose from and logistics challenges. We also have to understand the rules and

regulations in the specific country and develop the right agreements," Marsh says.

There is continual planning to make sure that resources and services are available in remote locations. "When you're drilling 120 miles offshore South America and something breaks, you can't pick up the phone and get a replacement part delivered immediately," Marsh says. "One of the first contracts we put in place for drilling campaigns is a shore base for materials and equipment. An idle rig waiting for equipment can cost hundreds

of thousands of dollars a day."

Providing infrastructure for information technology can also be challenging. "We may be operating in an environment with harsh conditions, such as the North Slope of Alaska, where below-freezing temperatures and polar bears are a threat, or in politically unsettled locations like Basra, Iraq," says Kellie Canaday, whose team sets up IT infrastructure and communications for upstream locations worldwide.

"Security issues and logistics can make getting people and equipment into a location very chal-



“We help the business focus on its core job of finding and producing oil.”

Peter Sturla
Global Real Estate and Facilities
Angola project manager



In Papua New Guinea, more than 360 employees will work in the ExxonMobil Haus, which features an open, collaborative work environment.

lenging, she adds. “Often, the sites lack basic infrastructure, and when there are no existing networks we can tie into, we deploy satellite and microwave services to provide network capabilities. As projects evolve, we work to develop more permanent communication solutions, such as fiber optic cable.”

Lasting impact

GSC’s support provides a lasting positive effect on the local population, including job creation, skills development, and economic impact through local leasing and purchasing.

When offices become operational, the company hires local workers to oversee office management and to provide procurement, contracting services, IT and other support.

“ExxonMobil develops the national workforce, optimizing skills and bringing our global knowledge and expertise to train local engineers, human resources folks, procurement specialists, real estate professionals and security personnel so that they can operate our sites consistently anywhere in the world,” Sturla notes.

Concentrating on people

But the underlying impact of GSC’s involvement at frontier sites is its capability to provide safer, more secure, productive and cost-effective offices and housing for employees. Along with that goes the installation of computer and telecommunications systems and the purchase and delivery of needed equipment and supplies.

“You want explorers to explore, developers to develop and producers to produce,” Clare says. “Our team’s business is to give ExxonMobil employ-

ees quality office space, secure residential facilities, and other technical tools and equipment so they can produce oil and gas.”

“Partnership is key to our success,” Canaday adds. “We work closely with the business, and understand the direct impact their work has and the value it provides. From bringing up a site on day one with IT services to experiencing the startup of production operations, there’s tremendous satisfaction in seeing these projects come to fruition.” **theLamp**

Knowledge is their business

ExxonMobil centers provide information when and where it's needed.

► During his 46-year career with ExxonMobil, research chemist Mike Siskin has authored more than 130 company reports, contributed to over 100 issued U.S. patents, and written more than 100 technical publications.

When the senior scientific advisor for ExxonMobil Research and Engineering Company (EMRE) starts a new project, his first stop is the ExxonMobil Downstream Technical Information Center.

Located at EMRE's facility in Clinton, New Jersey, the Downstream Technical Information Center is one of four that make up the ExxonMobil Library Information Network. Staffed by experts with advanced technical or information science degrees, the centers provide timely, cost-effective and quality information for the company's toughest information challenges.

"For the last 46 years, they have been the go-to department for me," says Siskin, whose downstream research has led to breakthroughs in delayed coking processes, development of next-generation absorbents and greater refining efficiencies.

Siskin begins each new project with a request to the center for abstracts and articles. "You really need to understand what's been looked at before and where the gaps are so as not to reinvent the

wheel," he says. "You learn from what's been done, what should have been done ... and it helps you take the idea from there."

Focus areas

Each information center specializes in a specific area of research:

- The Chemical Information Center in Baytown, Texas, provides technical information and intellectual property support in the areas of basic chemicals, intermediates and polymers for chemical research and technology centers worldwide.
- The Corporate Headquarters Information Center in Irving, Texas, focuses on business research, including financial, company, economic, industry, market, government, geopolitical and biographical information.
- The Downstream Technical Information Center in Clinton shares science and engineering information and intellectual property support.
- The Upstream Technical Information Center at the company's Houston campus specializes in geoscience, engineering and commercial technical information, as well as intellectual property support for Upstream Research, Exploration, Development, Production, Gas and Power Marketing, and XTO Energy.



Photo by Robert Seale



Gathering before a meeting at the Upstream Technical Information Center in Houston are (from left): Tim Nedwed, senior technical professional advisor; Gina Williamson, librarian; Chris Laursen, information specialist; and Jay Dias, chief scientist.

Together, these centers form a network of information resources that employees use to do their jobs better, faster and with greater confidence.

Specializing in answers

"What is the grain size of sand in the air in the Eastern desert of Saudi Arabia during a dust storm?" "What are the salaries of Norwegian helicopter pilots?" "Can you provide demand, capacity, past growth and future growth to 2030 for this list of 20 chemicals?" "What is the stress

point for steel on rigs in the Arctic?" These are just a sampling of questions posed to the 15 information specialists who staff the information centers.

While the ExxonMobil information network features historical documents and data – including company publications and technical reports from heritage companies as far back as the 1890s – it has evolved with technology services to meet current business needs.

Kristin Sandefur, supervisor with the Corporate Headquarters

Information Center, says the centers go beyond the stereotypical image of a library with shelves of books. "While we treasure our history and maintain historical print materials for research, we look at market resources and trends to provide information sources that give the most value to the company," she says.

Sandefur and her team are instrumental in providing research for the yearly ExxonMobil *Outlook for Energy* report. Every day brings new requests for business or financial information.

At right: Brian Lawless, manager of global pipeline integrity, and Dana Higgins, information specialist, collaborate regularly on a number of projects.

Below: Research Chemist Mike Siskin begins most of his research activities by calling Marie Latino, information management associate, who provides detailed studies and reports.



Photo by Janice Rubin



Photo by Robert Seale

"Someone in Procurement may request pricing information in a certain market, or Public and Government Affairs may need to know about political and social issues in a particular country where we operate," she says.

In-depth searches

In this day of Google and other search engines that provide instant links to information, the centers help employees sort through the clutter and zero in on quality information.

"As the Internet grows, it can be difficult to find precisely what you're looking for," says Rebecca Rucker, section head at the Downstream Technical Information Center. "We have the tools and expertise to sort

through myriad information to find what's relevant and accurate for employees to do their jobs."

That includes information for project teams, searches for technical data and patents, management of proprietary information, and answers to copyright questions.

"While today's workers are very adept at searching for information," says James McLennan, supervisor of the Upstream Technical Information Center, "the difference is that we have proprietary internal ExxonMobil documents and reports that aren't available in external databases."

Besides providing access to leading industry books, journals and periodicals, the centers subscribe to databases that pro-

vide quality industry, technical, patent and intellectual property information.

"If an engineer wants to calculate a formula for a pressure vessel, we subscribe to a service that allows them to use interactive formulas," says Dean Gronostaj, Chemical Information Center supervisor. "We also provide access to a search tool that allows a chemist to draw a molecule and conduct a search on it, resulting in the display of patents and journal articles containing chemical reactions and synthesis for that molecule."

The centers produce daily, weekly and monthly news alerts for senior managers, industry news for business and technical teams, competitor information, and technology updates for company analysts and engineers – all designed to provide insights into current industry developments.

"We help the company anticipate industry trends, which aids decision-making," Rucker says.

Coordinating resources

While each information center is specialized, they work together to coordinate resources to provide the most effective access to knowledge. For example, staff from the centers recently participated in a benchmarking survey of worldwide pipelines.

"The company's cross-functional information specialists provided us comprehensive, globally sourced data to help our engineers develop approaches for mitigating pipeline risks," says

Brian Lawless, ExxonMobil's manager of global pipeline integrity.

Fast and accurate

The staff prides itself on quick turnarounds. "The advice one of our information centers gives – 'If you can't find it in 15 minutes, contact us' – really applies to us all," says Information Specialist Dana Higgins. "We want our clients to get the best information in the timeliest manner so they can make the best decisions."

Jay Dias, chief scientist with ExxonMobil Chemical, says that rapid input is critical for discovery. "A day in the library can save you a year in the laboratory," Dias notes. "The information centers provide the foundation for research. Their input forms the basis for new projects and also provides quick access to evolving trends in science, technology and business."

For Tim Nedwed, senior technical professional advisor with ExxonMobil's Upstream Research Company, speed of information is powerful. "It allows my group to cycle through ideas quickly," he says, "making the research and development process much more efficient and enabling us to stay on top of technology."

And that's the real value the network brings. "We're here to accelerate development and support innovation," McLennan adds. "We're about enhancing the agility of our various businesses, vetting information to make sure that it's accurate, reliable and timely." **theLamp**

Bass Strait at 50

Australian venture marks the 50th anniversary of the country's first major offshore discovery well.

► The historic Gippsland Basin joint venture completed its first discovery well 50 years ago, in February 1965. That well and the offshore facilities that followed have supported production of some 4 billion barrels of oil and 8 trillion cubic feet of gas.

In the half century since the first discovery, investments of around \$20 billion have funded 17 platforms, associated subsea production systems and other offshore installations feeding a network of about 370 miles of pipelines.

Esso Australia operates the venture, in which Esso and BHP Billiton Petroleum (Bass Strait) Pty. Ltd. each have a 50 percent interest.

Onshore, investments include the Longford complex, comprising three gas plants and a crude-oil stabilization plant in the state of Victoria that serves as the onshore receiving point for the venture's Bass Strait production. Longford has supplied most of Victoria's gas requirements since 1969. It also supplies gas to New South Wales, Tasmania and other locations.

Additional facilities

About 115 miles west of Longford, the Long Island Point complex includes a fractionation plant for separating gas liquids processed at Longford into

separate ethane, propane and butane product streams. Long Island Point also stores crude oil before distribution to refineries in Australia and overseas. A jetty extending about 2,000 feet offshore is equipped to load gas liquids and oil onto ships.

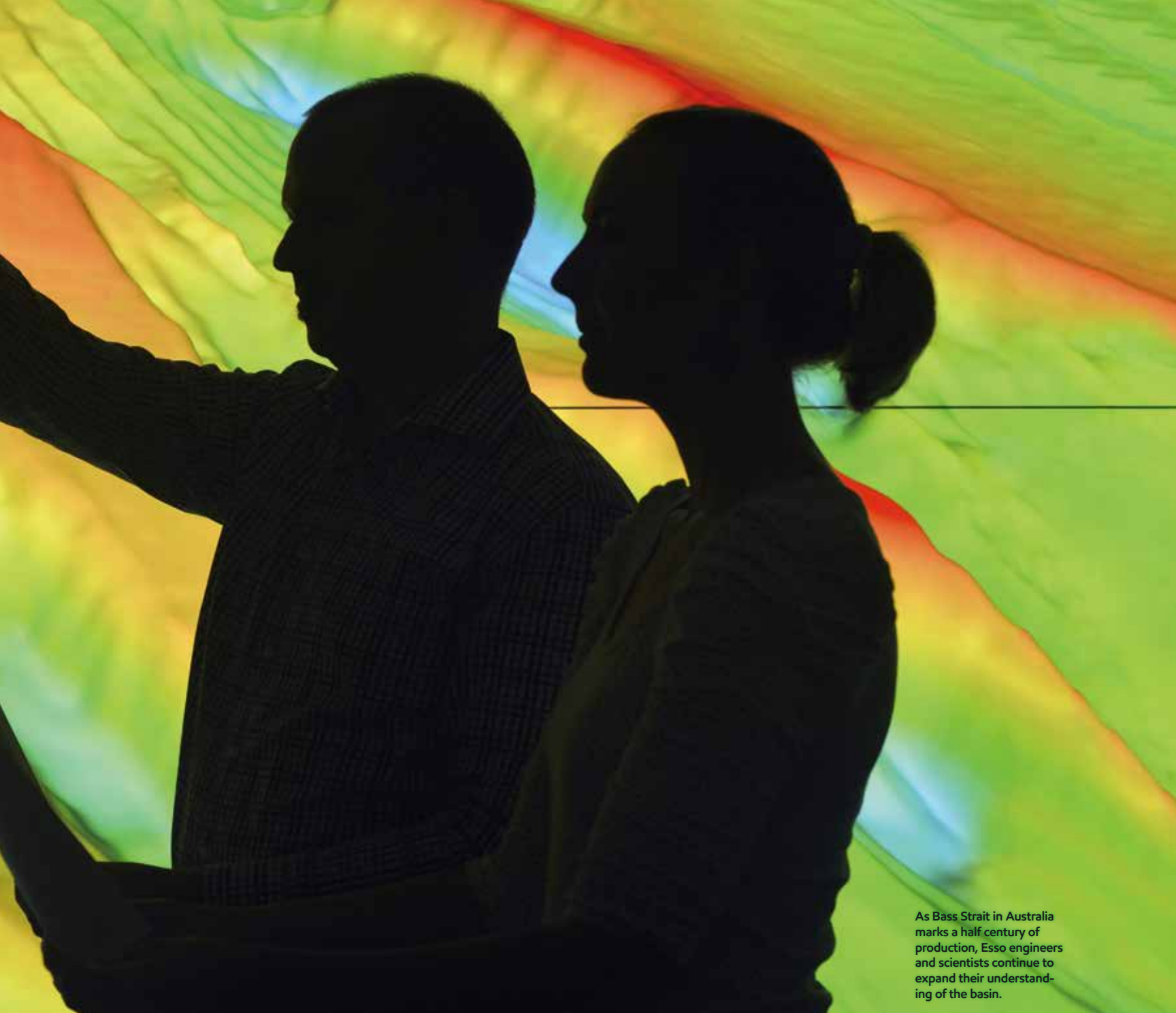
The joint venture's marine-support base is the Barry Beach Marine Terminal about 60 miles southwest of Longford. Its

1,300-foot wharf accommodates a pedestal crane with a 110-ton lifting capacity. Cargo shipments from Barry Beach to the offshore platforms average about 70,000 tons per year.

Richard Owen, Esso Australia chairman, describes the Gippsland Basin joint venture as one of the most enduring partnerships in Australia's corporate history.

"The story of oil and gas





As Bass Strait in Australia marks a half century of production, Esso engineers and scientists continue to expand their understanding of the basin.

in Australia will always hinge on Bass Strait," he says. "Our investments have been a critical building block underpinning the economic growth of this nation.

"At the peak of oil production in the early 1980s, the venture was delivering 10 percent of total federal revenue. Today, it meets nearly 40 percent of Australia's East Coast gas demand."

Maximizing value

Recent activity in the basin includes the Kipper Tuna Turrum (KTT) project, encompassing three fields in Bass Strait that hold an estimated 1.6 trillion cubic feet of gas, plus 110 million barrels of oil and gas liquids.

The KTT project reflects the company's focus on extracting maximum value from the investment and Gippsland Basin field

infrastructure. For example, oil facilities on the West Tuna platform, installed in 1996, have been converted to produce additional gas from the Tuna field, which has produced oil for more than 40 years.

In the Turrum field (the project's largest), the nearby 47-year-old Marlin A platform has been connected to the new Marlin B platform by bridge. The combination of platform facilities, including

compression capacity on Marlin B, enables greater production efficiencies along with increased volumes of oil and gas. Turrum gas, which contains higher levels of carbon dioxide (CO₂) than other Bass Strait fields, will continue to be reinjected back into the reservoir until a gas-conditioning plant comes online at Longford in 2016. Four more gas wells and an oil well were drilled this year.



The new Marlin B platform (right) has allowed the efficient production of the deep Turrum field, part of a three-field project holding an estimated 1.6 trillion cubic feet of gas and 110 million barrels of oil and natural-gas liquids.

Kipper

The Kipper field, discovered in 1986, is a joint venture between Esso Australia (operator, 32.5 percent), BHP Billiton (32.5 percent) and Santos Ltd. (35 percent). Gas and gas liquids will be produced through subsea wells tied to the West Tuna platform. Installed close to West Tuna, a smaller, unstaffed satellite platform called the Riser Access Tower links to West Tuna via bridge and connects the Kipper pipelines to West Tuna.

Owen notes that rising gas prices in southeastern Australia and supportive government

energy and regulatory policies helped make the KTT project economically feasible.

"Credit must also go, however, to the decades-long efforts of Esso and joint-venture scientists and engineers to expand their geoscientific understanding of the Gippsland Basin as well as their ongoing development and application of new technology," he says.

Turrum's time

A case in point is the Turrum field.

"Turrum was literally in the shadow of the Marlin field since its discovery in 1966," says David

Standfield, Gippsland projects manager. "The largest gas field in southeastern Australia, Marlin sits atop Turrum, which is more than a mile below the seafloor. Marlin is also typical of the more attractive early Gippsland Basin fields, with its large reserves of cleaner gas, high-pressure reservoirs and geology dominated by thick marine sands.

"Turrum, however, was always going to require significant capital investment. In addition to its higher levels of CO₂, Turrum's geology is much more complex. And unlike the shallower fields, its low reservoir pressure would

require offshore compression to produce, which meant the installation of another platform."

Things began to look up for Turrum after the Bass Strait's largest 3-D seismic survey in 2001.

"The survey allowed us to get a better picture of the reservoirs," Standfield says. "We later combined this information with data from an early-phase drilling program in which we drilled three oil wells and produced them back to the Marlin A platform. This oil production provided valuable data on the reservoir's performance and characteristics, and helped us develop some of the most sophis-

ticated reservoir modeling ever attempted in the Gippsland Basin. Based on what we learned about the field, and with the value of gas increasing in Australia's East Coast market, the venture moved forward with a gas-development plan for Turrum."

Safety excellence

While Esso Australia, on behalf of its venture partners, has reliably supplied energy to the country for almost half a century, Owen notes that their success has been underscored by an excellent safety record.

"We are an industry safety leader in Australia," he says. "In fact, Esso Australia won the Australian Petroleum Production and Exploration Association Safety Excellence Award in 2013 and 2014 for best oil and gas industry safety performance. For our Bass Strait operations in particular, we went more than 12 months during those two years without a recordable injury onshore or offshore."

Over that time, the workforce, including both employees and contractors, produced approximately 200 billion cubic feet of gas, 15 million barrels of oil and 14 million barrels of gas liquids. Achieving this involved:

- ▶ Moving 2,250 tons of rig equipment between platforms.
- ▶ Cooking and serving 300,000 meals to offshore workers.
- ▶ Delivering 74,000 tons of supplies and equipment.

Owen adds that it all comes down to one thing: "Our staff and contractors working together to put safety at the center of everything we do." **theLamp**

120 years of history

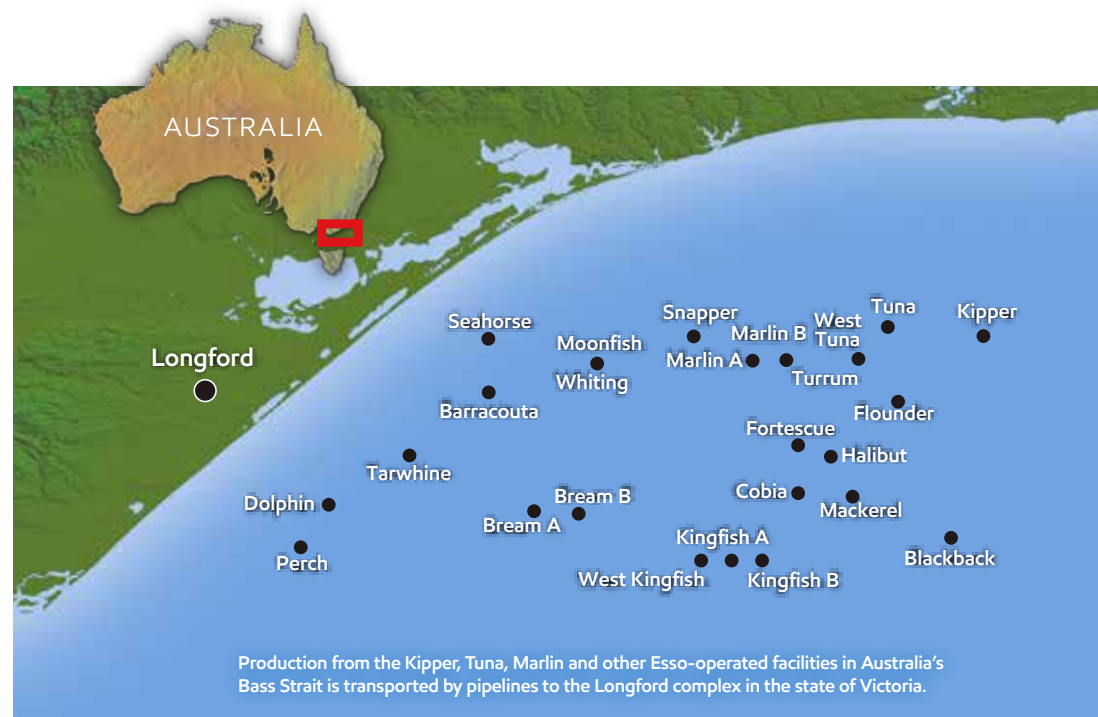
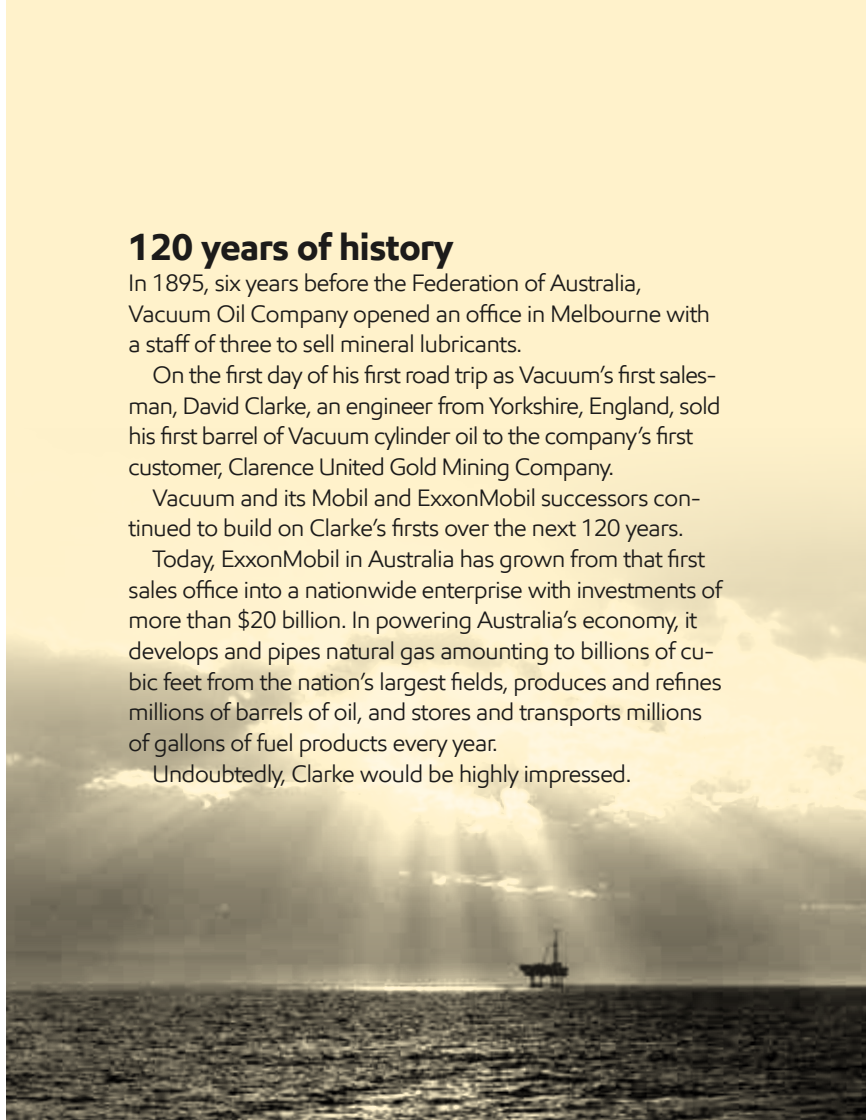
In 1895, six years before the Federation of Australia, Vacuum Oil Company opened an office in Melbourne with a staff of three to sell mineral lubricants.

On the first day of his first road trip as Vacuum's first salesman, David Clarke, an engineer from Yorkshire, England, sold his first barrel of Vacuum cylinder oil to the company's first customer, Clarence United Gold Mining Company.

Vacuum and its Mobil and ExxonMobil successors continued to build on Clarke's firsts over the next 120 years.

Today, ExxonMobil in Australia has grown from that first sales office into a nationwide enterprise with investments of more than \$20 billion. In powering Australia's economy, it develops and pipes natural gas amounting to billions of cubic feet from the nation's largest fields, produces and refines millions of barrels of oil, and stores and transports millions of gallons of fuel products every year.

Undoubtedly, Clarke would be highly impressed.



- ▶ Moving more than 20,000 workers to and from offshore platforms on 4,000 helicopter flights.



In Baytown, Texas, ExxonMobil Chemical is constructing new facilities to expand the capacity to make the building blocks for plastics. John Cummings (left), construction safety advisor, and Guadalupe Varela, carpenter, review safety procedures in the construction area where furnaces will soon be installed.

Photo by Robert Seale



The Rotterdam hydrocracker will be expanded to upgrade heavier byproducts into cleaner, higher-value finished products.

Rotterdam hydrocracker expansion

ExxonMobil will expand the hydrocracker unit at its Rotterdam refinery to upgrade heavier byproducts into cleaner, higher-value products, including base stocks and ultralow sulfur diesel, to meet growing global market demand.

Construction on the project is scheduled to begin next year, with unit startup anticipated in 2018.

"This investment demonstrates ExxonMobil's long-term view and disciplined investment approach," says Jerry Wascom, president of ExxonMobil Refining and Supply Company.

The base stocks to be produced at Rotterdam are a part of ExxonMobil's EHC product line, and are designed to help lubricant blenders achieve greater formulation flexibility and simplify global qualification testing. They also enable customers to cost-effectively blend a range of lubricants to meet evolving industry requirements.

The refinery, operated by Esso Nederland BV, is one of the most energy-efficient in Europe, and plays a key role in the region and the marketplace as a manufacturer of low-sulfur petroleum products and chemical feedstocks.



Commitment to climate change research

Exxon Mobil Corporation believes that climate change is a serious issue requiring research for solutions and effective policies that balance society's need for energy and environmental protection. As such, company scientists have been studying climate science for more than three decades.

Over the years, much of this research to improve the understanding of climate science has been done in conjunction with government bodies and leading research universities, and publicly available for several decades.

Our scientists have contributed climate research and related policy analysis to more than 50 papers in peer-reviewed publications. They've participated in the United Nations Intergovernmental Panel on Climate Change since its inception in 1988, and were involved in the National Academy of Sciences review of the third U.S. National Climate Assessment Report.

ExxonMobil advocates policy options that ensure a uniform and predictable cost of carbon; allow market prices to drive solutions; maximize transparency; reduce administrative complexity; promote global participation; and are easily adjusted to future developments in climate science and policy impacts. Since 2009, ExxonMobil has supported a revenue-neutral carbon tax as the most efficient and effective way for policymakers to put a price on carbon emissions.

Singapore investment

ExxonMobil is expanding its operations in Jurong, Singapore, to produce synthetic lubricants, including *Mobil 1*, the company's flagship synthetic engine oil. The expansion further strengthens the company's manufacturing capabilities and ability to meet the growing demand for ExxonMobil synthetic products in the Asia-Pacific region.

When completed in the second half of 2017, the facility will be one of six locations worldwide producing *Mobil 1*.

"*Mobil 1* is ExxonMobil's most advanced synthetic engine oil," says Bennett Hansen, ExxonMobil's Asia-Pacific lubricant sales director. "Adding Singapore to our network of *Mobil 1* manufacturing facilities will ensure that customers' needs are met well into the future."



The additional capacity in Singapore will support growing demand from automotive manufacturers and motorists.

Photo by Jeff Cheng



Research partner

A new \$1 million relationship between ExxonMobil and Michigan State University will expand research into the basic science required to advance algae-based fuels. The partnership seeks to improve the efficiency of photosynthesis in microalgae to produce biofuels and bio-products.

"We know certain types of algae produce bio-oils," said Vijay Swarup, vice president of ExxonMobil Research and Engineering Company. "The challenge is to find and develop algae that can produce bio-oils at scale on a cost-efficient basis."

The goal will be to ultimately process algae bio-oils in ExxonMobil refineries to supplement crude oil as the raw material to manufacture gasoline, diesel, aviation fuels and marine fuels. The company is also researching potential applications in chemicals and lubricants.

the Lamp

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