



# Deep Thinking

It's crunch time as Chevron strategists probe new depths in the U.S. Gulf of Mexico

**PLUS: 'Bridging the Gulf'**  
Spotlight on our dedicated aviation service in the region.

## April 2007 Issue

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## Deep Thinking

*It's crunch time as Chevron strategists probe new depths in the U.S. Gulf of Mexico.*

**I**t's been hard to miss. From the *Financial Times* and *The Wall Street Journal* to American prime-time television and global cable news, the mainstream media machine has kicked into high gear over Chevron's achievements in the deepwater U.S. Gulf of Mexico.

Written off years ago as picked over and picked clean, the Gulf has transformed itself into one of today's hottest places for deepwater exploration. For Chevron, it's become a place to set drilling records, push industry boundaries and capture the world's attention.

That attention comes from financial analysts, among others, watching our reputation grow. Deutsche Bank's Paul Sankey observes: "Nobody fully understands why two relatively poor Gulf of Mexico explorers should come together and form one absolutely outstanding one, but clearly the combination of Chevron and Texaco has worked to improve prospects and results right to the top of the class."

Why all the attention now? The answer lies both in front of the camera and behind.

As the world has been craving stable sources of oil, we made front page news by opening up a seemingly abundant frontier in the U.S. Gulf of Mexico's Lower Tertiary Wilcox Trend.

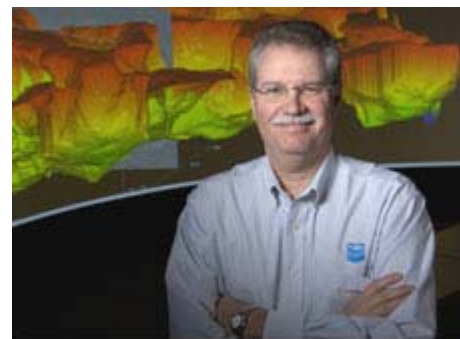
This trend is a 300-mile-long (483-km), salt-laced bed of rocks that are generally older, deeper and tighter than any strata ever produced in the deepwater Gulf.

Our 5-mile-deep (8-km) well test at Jack last year turned heads, not only for the half-dozen mechanical records we set but also for the large volume of oil we proved could flow at commercial rates from Wilcox - a trend the industry had eyed longingly for years.

### Excitement is 'What's Ahead'

Yet the real excitement is "what's ahead," vice president of Global Exploration, Bobby Ryan, told a packed financial analysts meeting in New York. Chevron holds six discoveries on Wilcox and has identified some 30 prospects to further review from our industry-leading 400-plus leases in the trend.

With estimates of Wilcox containing up to 15 billion barrels of oil, Bobby's eyes get a distant glimmer



"This lease turnover is going to dictate the 10-year future of several companies in the deepwater Gulf of Mexico," says James Cearley, general manager of deepwater exploration prospects for the Gulf.

when he considers “the drillable portfolio our review will likely yield.”

In fact, the eyes of many in our Deepwater Gulf business unit have that same distant glimmer. Because while Jack is the business unit’s latest success, it won’t likely be the last. Just behind the white-hot glare of the media, the business unit is employing a rigorous strategy at a pivotal time in Gulf history.

### Deepwater Food Fight

The strategy is called, in signature Chevron fashion, the “strategic framework for portfolio corridor development and prospect maturation,” or simply the Corridor Strategy.

Its time is ripe. Over the next two years, thousands of the industry’s 10-year leases that launched the mad dash into Gulf of Mexico deep water in 1996, ‘97 and ‘98 will expire. Chevron alone holds hundreds of these expiring parcels.

The vast majority of industry’s leases are expiring undrilled. Some are in 10,000-foot (3,050-m) waters that, until recently, were too deep for drillships to penetrate. Some lie beneath salt canopies once invisible to seismic analysis. Some went undrilled simply because rigs were unavailable in this supercharged market where day rates go for \$500,000 and more.

Whatever the reason, by 2009, they’ll all be back on the market and the food fight will begin again. Only this time, technological advances and Jack’s proof of a commercial flow will have further whetted the appetites of industry’s big, hungry players.

“This lease turnover is going to dictate the 10-year future of several companies in the deepwater Gulf of Mexico,” observes James Cearley, general manager of deepwater exploration prospects for the Gulf. “For us, it’s an opportunity to pick up more leases.” Bobby Ryan emphasized at the analysts meeting: “Rest assured that we’re not letting any prospects go that would damage our portfolio in any way.”

### Enter the Corridor Strategy

Here’s how the Corridor Strategy works. Earth scientists rank each prospect, or undrilled opportunity, by two things: its potential volume of hydrocarbons and its probability of flowing at commercial rates. Top prospects from that screening are plotted on a map using two or more criteria: their proximity to existing discoveries and their potential to contribute enough hydrocarbons to a given area to justify commercial development.

The goal is to cluster prospects and discoveries within 20-mile-radius (32-km) circles, or hubs. Twenty miles is the accepted distance for piping or “tying back” production from any one field to a processing unit or local host within the circle.

(Today, if oil or gas has to be piped more than 20 miles, flow assurance becomes problematic. However, Chevron and the industry are working on emerging technology that may one day yield 200-mile-long [322-km] tiebacks.)

Viewed on maps, these hubs fall into potential infrastructure corridors. Like pearls on a string, the hubs overlie nearly contiguous hydrocarbon deposits.



Blind Faith hull construction at Aker Kaverner fabrication yard in Norway.

## Getting the Right Volume

Inside any given hub, Chevron must accumulate working interest in enough prospects - or secure enough barrels - to justify the cost of infrastructure, notably the processing host. That threshold volume will be greater in a frontier corridor with difficult geology and no infrastructure, such as Jack's location in the Wilcox Trend's tight Eocene-age rocks, than it is in Tahiti's Green Canyon area, where some industry infrastructure exists and oil flows through younger and more permeable Miocene-age rocks.



Our Jack production test last year set more than a half-dozen records and turned lots of heads.

"This means we can go after smaller prospects in Green Canyon," says James. "But it also means that once any hub has enough barrels to justify infrastructure, tying in satellite prospects becomes very economic."

Case in point: We plan to tie production from our Wilcox discoveries, Great White, Tobago and Silvertip, to a central processing facility inside the hub called Perdido Regional Host. Chevron has a 37.5 percent interest in the Perdido host, which will be the deepest spar production facility in the world, moored in about 8,000 feet (2,438 m) of water.

## Risk and the Drill Queue

By identifying a queue of high-priority prospects and drilling the top one, "we'll get critical information about the prospectivity of other opportunities within that 20-mile radius," says James. "It directly influences our perception of risk and opportunity in other prospects, not just within the tieback-hub radius but along the whole corridor."

Whether a well hits pay dirt or not, it provides critical geologic data that "allows us to consider either abandoning a trend or, if successful, move the prospect up for early appraisal," adds James.

(Appraisal drilling further defines the field limits and reservoir properties. The faster discoveries are appraised, the faster a sequence of follow-up prospects can be planned and drilled, and the faster a conceptual hub can become an oil-producing development.)

## Nod From Analysts

Industry observers seem to like our strategy. With conventional exploration success rates "around 20 percent," says leading financial firm Sanford Bernstein, "Chevron's focus on a small number of key basins and concepts, thereby maximizing basin knowledge, has resulted in the company's exploration success rate reaching an average of 45 percent over the last five years."

Kudos aside, come next year, the Deepwater Gulf team will take a long, hard look in the mirror. Will they have rebuilt enough of their portfolio to support their corridor strategy and their position among Exploration's four focus areas (the others are Western Africa deep water, the Gulf of Thailand and offshore northwest Australia)?

Time, and the Corridor Strategy, will tell. Last year we replenished about one-third of the total Gulf of Mexico deepwater portfolio volume that we had at the beginning of 2006. But portfolio size alone won't determine the region's future. "We'll also have to answer whether the Lower Tertiary played out," observes James. "Did we have the rig slots to deliver our plan? Did technology evolve to lower the risk and check our costs?"



## **A Pony With Many Tricks**

Whatever the ultimate answers are, says James, asking these questions is the best way to build a batting order of high-potential prospects and ensure our long-term future.

Confident we're not the "one-trick pony" of the Lower Tertiary, industry watchers are banking on that future. Says Sanford Bernstein: Chevron's exploration portfolio "extends well beyond the company's recent successes in the Gulf of Mexico, and this, we believe, will support the production into the next decade."

## **Well Positioned in the U.S. Deep Gulf**

Since taking out its first lease in the U.S. Gulf of Mexico deepwater in the early 1980s, Chevron has earned a reputation as one of the region's top producers and explorers.

In addition to being one of the top leaseholders in the deepwater Gulf, we were the first company to drill in water depths greater than 10,000 feet (3,048 m). And in 2005, we drilled the Gulf's deepest well - a total depth of nearly 6.5 miles (10.5 km) - at Green Canyon's Knotty Head.

Chevron employs about 2,000 people in the entire Gulf of Mexico and operates more than 600 platforms, with the vast majority in shallow waters.

In 2006, our deepwater Gulf production averaged a net daily 41,500 barrels of oil-equivalent and came from Chevron-operated Genesis, Petronius and Perseus, and from nonoperated K-2 and Mad Dog fields. With five sanctioned major deepwater Gulf fields still in development, substantial production growth lies ahead.

That growth will come from:

- Tahiti - Prior to last year's Jack well test, this field was home to the deepest successful production test in Gulf history.
- Blind Faith - First oil is expected from this field and Tahiti in 2008.
- Great White, Silvertip and Tobago - Production from these fields through the Perdido Regional Host is expected to begin around the turn of the decade.

Tomorrow's production growth will also come from today's discoveries. Our recent Gulf exploratory successes include Big Foot, Knotty Head, St. Malo, Puma, Tubular Bells, Tonga and Jack. With a production test that set more than a half-dozen records for test-equipment pressure, depth and duration in deepwater, Jack opened the doors for development of the frontier Lower Tertiary Wilcox Trend, said to contain between 3 billion and 15 billion barrels of oil.

# Bridging the Gulf

*Chevron's increasing push for new energy resources in the U.S. Gulf of Mexico relies on a dedicated aviation service.*

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**F**or more than 60 years, company aircraft have flown the U.S. Gulf of Mexico, transporting people and cargo to offshore platforms.

Today, as the search for energy intensifies, that effort continues to grow. What began as a single airplane has become 30 Chevron-owned and operated helicopters, one fixed-wing aircraft, and several contract helicopters.

This fleet is located at four aviation field bases, with facilities in Venice, Louisiana, newly rebuilt following Hurricane Katrina; Intracoastal City, following Hurricane Rita; and Leeville, after both storms. Each of the facilities is elevated for greater storm protection and will support all of Chevron's offshore activities in the U.S. Gulf of Mexico.

In 2006, this fleet logged more than 26,000 hours of air time, made over 151,000 trips, and flew approximately 300,000 passengers to and from offshore platforms and other structures. That's a level of activity rivaling some airlines, and it is more flights per day than many of the world's busiest airports.

To sustain this level of activity requires 68 company pilots, many of them decorated military veterans, and about 100 skilled mechanics and technical specialists. Now, as oil and gas exploration in the U.S. Gulf of Mexico pushes farther from shore, these pilots are flying greater distances, traveling up to 140 miles each way to ferry people on and off platforms like Petronius and rigs and drillships like the *Discoverer Deep Seas*.

## Heights of Safety

That means ever more attention to operational excellence. U.S. Gulf of Mexico Aircraft Operations has worked approximately three and a half years without a lost workday. Since 1989, those operations have earned nine Chairman's Excellence in Safety Awards. And they have won important outside honors, including the U.S. Federal Aviation Authority's (FAA) 2006 Diamond Award, which recognizes maintenance programs and employees who have achieved high levels of certified training.

"We have higher operational standards than any helicopter transportation company in the world," says Ken Kersker, manager of Aircraft Operations for the U.S. Gulf of Mexico business unit. "Our pilots and maintenance personnel are among the best in the business – well-trained and experienced professionals fully committed to supporting all U.S. Gulf of Mexico operations by providing the industry's most reliable air service."



Pilot Bill Schroeder, training coordinator for the "Blue Crew," at the controls of one of Chevron's 30 helicopters that fly U.S. Gulf of Mexico workers on- and offshore.

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He adds that their FAA-certified mechanics provide a full range of services, from routine maintenance checks to complete aircraft overhauls and upkeep of critical communication equipment such as global positioning systems and radar. Chevron operates its aviation maintenance facility in Picayune, Mississippi, to support the entire fleet.

### Hurricane Ready

While routine transportation is important, it is only part of the story. When a hurricane or other major storm enters the U.S. Gulf of Mexico, the mission changes to quickly and safely evacuating the people working on Chevron's oil and gas platforms. Having a dedicated aviation team enables this process to be well planned and efficient, as flight crews repeatedly demonstrated during the 2005 storm season.



A Chevron helicopter lands on the drillship *Discover Deep Seas*. In the distance, The *Thialf* pipe-laying barge is providing services to the Tahiti project.

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Christmas day at Leeville shore base, one of Chevron's four aviation bases serving the U.S. Gulf of Mexico business unit.

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"That year, hurricanes like Katrina and Rita disrupted lives and devastated facilities, requiring evacuations from Chevron platforms an extraordinary seven times," says Melody Meyer, vice president for the U.S. Gulf of Mexico. "Approximately 10,000 offshore personnel had to be transported to shore and returned to their platforms once the storm had passed. Thanks largely to Aircraft Operations, these evacuations were conducted safely and without any injuries."



## Easing the Route to ‘Global Mobile’

*How we leverage existing experience to help employees reach across cultural divides.*

“ You can standardize an engineering process, but you can’t standardize culture,” says Tawatchai Siripatrachai, an engineer from Thailand working at Chevron’s San Ramon headquarters. Siripatrachai speaks from experience.



Employees Panji Reko (left) and Nong Nguanprasert from Thailand took part in a multicultural orientation workshop in Houston, Texas.

With help from Chevron’s Intercultural Development Group (IDG), he has developed the cultural fluency needed to excel in his new environment.

As a company which conducts business in some 180 countries, Chevron relies on having employees who can adapt quickly and sensitively to working in a global environment, either as members of multicultural teams or on far-flung assignments. IDG’s multicultural specialists are in charge of easing the process of adaptation for both employees and their families.

This is particularly important in the current highly competitive business environment in which the company is working aggressively to retain and recruit talent. Building the “global

mobile” workforce - encouraging and helping those who are prepared to work in a foreign country - will help achieve those goals.

The IDG specialists, who work in Global Expatriate Administration, part of Corporate Human Resources, play an important role in the process. They have developed a sophisticated, flexible orientation program that helps expatriate employees and their families appreciate cultural differences and foster closer business and personal relationships.

During 2006 alone, some 830 expatriate employees and their families participated in the IDG program, which includes orientation sessions, workshops, seminars and one-to-one interactions. Individual programs are tailored to particular needs.

*‘Cultural adaptation covers many aspects of behavior, including what is considered respectful in a given society.’*



"We focus on helping employees understand what an international assignment looks like," explains IDG adviser Ron Mortensen, "and we're giving them some of the tools to help them succeed in their new environment."

To guide expatriates through their new environments, the program enlists employees from the host country as well as employees and spouses who have returned from an international assignment.

"Often we bring in employees and spouses who can narrate their experience with a particular culture and location," says Ron. "By virtually putting the expatriates into their new environment, we help them better manage the uncertainty they may be feeling."

Ron explains, "We try to match up people as closely as possible, including job type and family status - whether single, empty nesters or those with children still at home. This commonality helps them build a framework to better understand the expatriate experience."

When employee Kevin Burningham was being transferred to the Tengiz Field, Kazakhstan, he and his wife, Marian, attended an IDG orientation. "A time like this can create a great deal of anxiety because so much is unknown," says Marian. "The knowledge, experience and insights that were shared with us have given us a sense of comfort that would otherwise be lacking."

The process of cultural adaptation covers many aspects of behavior, including what is considered respectful in a given society, how to become a better listener, and such nuances as how different people value privacy versus closeness, individuality versus group orientation, and task focus versus strong personal relationships.

The IDG group also works with multicultural teams. Ron says studies have shown that such teams come up with more ideas and potential solutions than do single-culture teams. "However, this can only happen," he says, "when the team recognizes when to leverage and when to de-emphasize its diversity and how to balance creativity and agreement."

The need for such cross-cultural awareness grows as the company expands globally. The program gained additional impetus in 2005 when Chevron acquired Unocal, a company with a major presence in the Asia-Pacific and Caspian regions and the U.S. Gulf Coast. As more than 6,000 Unocal employees joined the Chevron workforce, new opportunities arose for multicultural interaction.

Chevron management is acutely aware of the importance of communicating well across cultures. In fact, says Ron, "The business is driving our programs." IDG began by working with Global Upstream units and is now increasingly involved with Downstream as well. "The program is building momentum because individual businesses understand that cultural adaptation is critical to their success," Ron continues.

IDG has worked with the Downstream's Project Olympic, which involves schooling the nearly 300 multicultural employees working on this major systems-standardization drive in the importance of working as a team. IDG also has conducted a program in cultural adaptation for employees from 11 countries who are being mentored by the Chevron Fellows (a group of distinguished company technologists).



Billy Leal, his wife, Nancy (left), and their daughter, Leah, share a laugh during their Korean cultural orientation session in 2004. The family attended a seminar to help them become more culturally fluent in readiness for Billy's work assignment in Okpo, South Korea.

The business impact of the multicultural programs has been confirmed by the Global Employee Survey. "The data from the Asia South business unit indicates that the programs help employees better identify certain issues and define interventions," says Ron.

At a time when Chevron is moving more employees from a wider range of countries and cultures than at any time in its past, IDG's services are vital - and in increasing demand.



## Inside the Coral Triangle

*Supporting biodiversity and sustaining livelihoods in Indonesia.*

**H**ow do you protect nature in a place where the average income is less than \$5 a day and giant sea-turtle eggs plucked off a beach fetch upwards of \$17? How do you promote conservation where a pair of fins bound for shark-fin soup pays a multiple of the average villager's monthly earnings?

And should a company like Chevron even intervene when principles of conservation collide headlong with local economic realities?

These are some of the challenges that a partnership between Chevron and The Nature Conservancy (TNC) is tackling in Indonesia's East Kalimantan on the island of Borneo.



Eastern Indonesian seas are at the heart of the Coral Triangle. They host nearly a quarter of the world's fish species and provide breeding grounds for diverse marine mammals and coral larvae.

Indonesia – a nation of nearly 18,000 islands – is unique in the diversity and richness of its marine fisheries. The island archipelago could sustainably support not just subsistence livelihoods, but also marine tourism (scuba diving is a huge draw in some areas) and lucrative commercial fisheries, if overexploitation and habitat

destruction can be abated.

That's where Chevron's partnership comes in. Called "Ridges to Reefs," our five-year effort has focused on environmental awareness, marine research, conservation and sustainable livelihoods.

The Ridges to Reefs project is located on the Derawan Islands between our IndoAsia business unit operations in Indonesia. Those operations include oil and gas production facilities in the Kutei Basin between Kalimantan and Sulawesi Islands; a cogeneration plant and oil fields on the island of Sumatra, including the world's largest steamflood in Duri; and two geothermal plants on the island of Java.

In East Kalimantan, the Chevron-TNC partnership established the Derawan Islands Marine Biodiversity and Coastal Livelihoods Project. Its achievements have been diverse: The project partnered with other NGOs and the government to champion the area for special protection designation.

The project also tested reef restoration structures, inventoried species, and researched rarities such as the giant manta ray, the pygmy seahorse, and the hawksbill and green giant sea turtles, which may become regionally endangered if egg poaching doesn't stop (it takes 50 to 80 years for an adult female to mature to egg-bearing age - more than a lifetime for the average fisherman).

But the project's greatest challenge - and achievement - has been in convincing the local community that conservation and sustainable livelihoods aren't mutually exclusive.

The economic challenges are real. On East Kalimantan, the international market for giant sea-turtle eggs brings a princely sum. Furthermore, many local residents have feared that conservation will threaten their livelihoods.

Yet Chevron and TNC have made progress. In meetings with community members in more than 25 coastal villages, fisherman said they agreed with the need to sustainably manage marine resources and welcomed the initiative to establish protected marine areas.

The partnership also engaged local fisherman, students, village leaders and government officials in raising awareness in fishing communities about the devastating effects that harvesting shark fins for soup has had on shark populations.

"We do not pretend to have all the answers" says Robert Bearden, senior vice president of Kalimantan operations. "But deliberate efforts to engage communities are vitally important and help ensure long-term success."

During the more than 80 years that Chevron has been active in Indonesia, we have recorded many environmental successes, including reforesting mangroves in coastal communities, replanting trees in tropical forests, and protecting endangered elephants and orangutans.

"This project is a testament to the value of partnerships," says Chris Prattini, managing director of the IndoAsia business unit. "By working together with communities, governments and nonprofit organizations, we can develop viable sustainable solutions to environmental challenges."



## HOW IT WORKS

### Building Leader Ships

*Drillship The Discoverer Clear Leader will be able to drill deeper wells and through deeper water than ever before.*

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When it comes to deepwater drilling, Chevron holds the records.

We hold the record for drilling in the deepest water depth (10,011 feet [3,051 m]). We hold the record for drilling the deepest U.S. Gulf of Mexico well (nearly 6.5 miles [10.5 km] total depth).

And a new drillship under contract with Chevron, the *Discoverer Clear Leader*, will be able to drill deeper than our previous record-setting wells.

When completed in 2009, the \$650 million vessel will be one of the few drillships capable of lifting 40,000 feet [12,200 m] of metal pipe, pumping fluids that distance and back, drilling in more than 2 miles (3.2 km) of water and boring nearly 8 miles (13 km) below sea level. Its identical sister ship, the *Discoverer Inspiration*, will be ready 14 months later.

The two vessels are being built by Transocean, the Houston-based builder of the last-generation, record-setting drillships *Discoverer Deep Seas* and *Discoverer Spirit*, which set our records for deepest water depth and deepest Gulf of Mexico well.

*Discoverer Clear Leader* and *Discoverer Inspiration* will operate under contract to Chevron for up to five years in the U.S. Gulf of Mexico. Because of this agreement, we'll be paying day rates through 2014 that have already been surpassed on today's spot market.

Transocean designed *Discoverer Clear Leader* and *Discoverer Inspiration* for the long queue of challenging deepwater wells we will drill in the coming years. To reduce downtime and increase the drillships' flexibility to evade bad weather, the team built in extra power and redundancy. Nearly three football fields long and carrying up to 200 crew members, these drillships will nonetheless be among the most maneuverable vessels in the world. Attributes include:

- **Thrusters:** Six thrusters beneath the hull keep the ship stationary. They can rotate 360 degrees, and each has 7,000 horsepower.
- **Dynamic Positioning:** The vessel interprets positioning data from land, the seabed and space, as well as wind and ocean motion, and adjusts the thrusters accordingly to stay within a few feet of the well thousands of feet below.
- **Top Drive:** A 1,250-ton top drive can turn the drill bit at 40,000 feet and help lift 1,250 tons of drill pipe – two-thirds more hoisting and rotating power than *Discoverer Deep Seas*.
- **Blow-Out Preventer (BOP):** The new ships will be the first Chevron-leased drillships to have two BOPs, which are critical to crew safety and protecting the environment. BOPs are large valves on the seafloor that can be activated to seal off the hole, preventing it from blowing out.



- **Crude Storage Capacity:** New drillships will be able to store up to 125,000 barrels of oil, enabling extended well testing and storage of produced fluids.
- **Shale Shakers:** With 10 instead of eight shale shakers – vibrating sieves that remove cuttings from the drill mud – mud can be processed and big holes can be drilled faster.
- **Mud Pumps:** Five mud pumps will more than double the new rigs' capacity for circulating drilling mud, compared with last-generation drillships.



## OUR COMMUNITIES

# Pembroke Refinery – Wildlife Haven

*Industry and nature thrive together in Wales.*

Located in an isolated rural area next to the only coastal national park in the United Kingdom and surrounded by thriving wetlands, Chevron's Pembroke Refinery had long been a wildlife haven.

In 1997, Pembroke took a step toward making that official. The refinery in southwest Wales joined a University of Ulster study of the potential for large industrial sites to serve as "biosanctuaries."

"We had a rich environmental resource that we wanted to share," says David Heath, who represented Chevron on the study team. The study was the first action in a chain of events that led Chevron, with strong support from the U.K.'s Prince's Trust charity and the Countryside Council for Wales (a nongovernmental organization), to open an environmental center on refinery property last year.

### PROJECT PHOTO GALLERY



#### From Church to Laboratory

St. Mary's church was erected in the 14th century by the parish priest, Radulph Beneger. Chevron completed refurbishing the church as an environmental studies center in 2004. Today Father Beneger's effigy still can be seen in a recess in the church wall.

### Building Boardwalks, Skills and Self-Esteem

Volunteers from the Prince's Trust, which aids young people in realizing their potential, helped transform an abandoned, deconsecrated 14th-century church into the Pwllcrochan Environmental and Community Centre.

“Working at Pwllcrochan gives disadvantaged youth a unique opportunity,” says Lynne Chattoe, rural development officer for the Prince’s Trust. “Participants build practical skills and self-esteem, while taking in nature’s beauty.”

Chevron spent more than £100,000 (\$200,000) on the church renovation, creating a well-equipped biology laboratory and conference center. In addition, the company contributes nearly £5,000 (\$10,000) to approximately £10,000 (\$20,000) annually to operate the center, which hosts local students and community members free of charge.

“Hundreds of young people from the Prince’s Trust have worked exceptionally hard to enhance the marsh, digging out dried-up ponds, building boardwalks and observation platforms, and installing public art along pathways,” says Alison Kavanagh, a Pembroke Refinery public affairs assistant.

Walkways extend through a fragile reed marsh to oak woodlands and the ruins of a medieval manor house. Following wetlands boardwalks, visitors encounter a variety of wildlife, including skylarks, otters, newts and tadpoles. Walkers on the Pembrokeshire Coast footpath pass by the center and through the adjacent Pembrokeshire Coast National Park.

### **Pwllcrochan Gets Rave Reviews**

Already, interest in Pwllcrochan, which has been designated a site of special scientific interest, has exceeded expectations. Since the center opened last spring, more than 1,400 students and community residents have visited. The project has generated considerable media attention and broad support from public and private donors, including Biffaward, a U.K. Landfill Communities Fund distributor; the U.K.’s Big Lottery Fund Enfys grant program; and the Welsh Development Agency.

Visitor response has been equally enthusiastic. Guest register comments are filled with superlatives: “A super day,” “Just great,” “Very impressive,” “Superb facility,” “Fantastic setting,” “An excellent resource.”

Educational activities complement local schools’ science curriculum. At pond dipping stations, students use nets to capture aquatic samples to study in the center laboratory. Creatures are handled carefully and returned safely to ponds.

Students from Pembroke Dock Community School are “absolutely, totally captivated” by the experience, says Anthea Finn, assistant head teacher. “Pwllcrochan is an excellent place to enrich our science studies and develop student awareness of the outdoors.”

Retired refinery employees host primary school visits, and retired local teacher Ann Morris directs student field studies. Staff from the UK’s Field Studies Council, an environmental education organization, volunteer as subject matter experts.

### **Building Bonds With the Community**

“No other company in west Wales has been as forward-thinking and supportive of such a large community-based project as Chevron,” says Lynne. “The project has exceeded our expectations, and the center is highly regarded by Trust staff and local residents.”

Future plans include extending boardwalks, improving access to an ancient woodland on the property and providing renewable energy demonstration facilities.

“The center has reinforced the excellent relationship Pembroke Refinery historically has had with local residents,” says refinery general manager Morgan Clark. “Now we are seen not only as a desirable employer but also as a valuable community resource.”



## VOICES

# What can people do in their daily lives to help save energy resources?

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**Carlos Espinal**

***Intern – Health, Environment and Safety,  
Chevron International Exploration and Production  
Puerto la Cruz, Venezuela***



**“There’s no need for huge investments of time and**

money to make big changes in the way we use energy. We just need to make a few adjustments in our daily lives. Use as much natural lighting as you can; it’s healthier and won’t use any power. Turn on only the light you need; use a desk lamp to read instead of lighting the whole room. Bicycle, instead of driving. Don’t use leaf blowers; sweeping is more energy efficient and good exercise. Air conditioning uses LOTS of power; in summer, wear light clothes and open windows for breezes. Only run the washing machine when full.”



**Nancy J. Frazee**

***Legal Assistant, Negotiations and Legal,  
Chevron International Exploration and Production  
San Ramon, California, United States***

**“As a North American driver, the first thought that**

comes to my mind is ... SLOW DOWN! It takes more gas to drive faster and is unsafe. Next, learn about energy resources. There is a lot of “hoo-ha” floating around. Be a bearer of correct information. Also, take a long-range view: how does what I do today affect tomorrow’s resources? Lastly, recycle. So simple, so reasonable! Reuse or repair – don’t replace.”

**Sebastian Hamberger**

***Project Engineer, Burnaby Refinery,  
Chevron Canada Ltd.  
Burnaby, British Columbia, Canada***



**“I designed and built a solar hot water heater for my**

home in Delta, British Columbia, to reduce the natural gas needed to heat my hot water tank. I got interested in solar systems after hearing about relatives in Germany installing them to offset water heating costs. The system cuts my water heating bill by CAN\$100 to \$150 [U.S. \$90 – \$130]

annually and reduces carbon dioxide emissions from my home. Given recent rises in energy costs, solar hot water heaters are gaining popularity in North America. Email me at [sebh@chevron.com](mailto:sebh@chevron.com) if you'd like an article with a description and pictures of my system."



**Dries De Kock**  
**Operations Supervisor,**  
**Chevron South Africa (Pty) Ltd.**  
**Cape Town, South Africa**

**“In 2006, we had electrical outages in Cape Town, and**

the shortage of power for lights and hot water in our house was a real eye-opener.

Traffic lights, garage door openers, alarm clocks, PCs, coffee pots and microwaves wouldn't operate. To save energy, we showered instead of taking baths and unplugged all electrical appliances so equipment would not default to standby." [Cape Town suffered rolling blackouts last year due to power grid failures that created home, business and municipal problems throughout the city – Editor.]

**Christopher Ndivyo**

**Business Consultant,**  
**Chevron Tanzania Ltd.**  
**Dar es Salaam, Tanzania**



**“Your car emits as much carbon dioxide as your entire**

house. That's the bad news. The good news is that anything you do to improve your car's fuel efficiency will have an enormous impact on climate change. Paying attention to auto fuel efficiency may be the single biggest thing you can do to prevent global warming. Replacing your gas-guzzling car with a fuel-efficient one (like a hybrid) is wonderful.”



**Joseph Raj Puthotta**  
**Senior Manager, Operations – Lubricants Plant,**  
**Chevron Global Lubricants**  
**Chennai, India**

**“Keep your house not too hot, not too cold! Half of**

household energy cost goes toward heating and cooling. Small changes can make dramatic improvements in household fuel efficiency. Older heating and cooling systems are one-third less efficient than newer systems. If replacement isn't practical, tuning up your heating system can cut heating costs by 10 percent annually. Clean vents, close unused vents and change air filters. Buy a programmable thermostat and use it. Seal all windows and doors.”

## Readers' Top Energy Saving Tips

Readers clearly have a lot of "human energy" for the topic of energy efficiency, judging by the huge response we received to this question. Here we summarize some of your best energy-saving ideas.



- Make saving energy a habit, and challenge all actions that waste energy. Conserve gasoline, water, natural gas and electricity.  
*–Sambamoorthy Subramanian and Parinaz Sigamora, India; Kennedy Onuora, Nigeria.*
- Hang clothes in the sun to dry. Wash dishes by hand. Switch off electrical appliances and equipment when not in use. Turn off unneeded lights.  
*–Moafiqul Alam, Bangladesh; Nkem Agwuibe, Lynn Ejimonyeabala and Anthony Salami, Nigeria; Nicolette Alexander, South Africa; Antonio Garibay and Ernest Gibson, United States.*
- Live closer to work and support high-density housing. Walk as much as possible. Instead of watching television, go out with friends; drive cars with smaller engines.  
*–Francis Adeboye, Nigeria; Syed Umar, Pakistan; Richard Wilson, United States.*
- Change filters for heating and cooling units regularly. Don't set hot water heaters on high. Use low wattage light bulbs. Keep auto tires properly inflated. Maintain car engines and workplace equipment. Carpool or take public transport.  
*–Antonio Mateus, Angola; Ahmed Sharif, Bangladesh; Joe McGee and Dilip Mody, United States.*
- Close or tilt blinds to cool rooms during the day and reduce heat loss at night. Use compact fluorescent lamps. Install low-flow showerheads and aerators on sink spouts. Use solar lights outside. Let food cool to room temperature before refrigerating.  
*–S.R. Fernandez, India; Naila Malick, Pakistan.*
- We can make a difference by doing simple things! Print on both sides of each page. Turn off computers when not in use. Recycle plastic and glass. Don't use aerosol sprays. Help preserve open space.  
*–Agustina Parwitosari, Indonesia; Tammy Verner-Dunstan, United States.*
- Use Caltex with Techron fuel in your car. Avoid "jack rabbit" starts, and coast towards stop lights. Park at the first available spot.  
*–Ben Krueger, Indonesia; Khalid Syed, Pakistan; Daryl Wilson, United States.*
- Be aware of how much energy you use. Remember that oil and gas are finite resources. Support the use of renewable biofuel, solar and geothermal energy. Work to stop illegal activities that impede energy production.  
*–Sujauddin Nizami, Bangladesh; Rizwan Juhara and Tig Yulianto, Indonesia; Nkechi Odebiyi, Nigeria; Richard Vinas, Philippines; Chanaka Samarasinghe, Sri Lanka.*



Our photo contest has been a hit with many readers and it was among topics that drew letters of praise for our February issue.

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### **Loved the Photos!**

I enjoyed the photos from around the world and had trouble choosing only five. Would it be possible to issue a screen saver with these photos repeating in a loop or at least produce a Chevron calendar? It would be a nice way to share and enjoy these lovely photos throughout the year.

**Terri Romanoff, Bakersfield, California, United States**

Unbelievable collection of photos from our employees. You should create a nice calendar or screen saver set from these and sell them as a fundraiser for the "Week of Caring" activity.

**Bob Murphy, San Ramon, California, United States**

I think you should give 10 cameras and let us vote for 10 pictures. The last five I cut from my list were just as good and emotional and depicted where the photographer lived as the five I kept.

**Antonio Quiros, Houston, Texas, United States**

*Editor's comment: Thank you for all your compliments about the many fine photos submitted and for your suggestions for further uses of the pictures, some of which we will follow up on. We are now looking forward to seeing more of your great photos – watch for the announcement of a new photo contest in the next issue of Line Rider!*

### **Bringing New Meaning to 'Waste'**

The general meaning of 'waste' is 'useless.' But in Chevron's dictionary it has a different meaning. Yes, waste means energy. This article ["Putting Waste To Work," February issue] had bundles of useful information on how wastewater treatment can bring electricity. Really wonderful!

**Subramanian Sambamoorthy, Madurai, India**

After reading "Putting Waste to Work" and noting that up to 3,000 gallons of grease are consumed in the process of generating 175 kw of electricity, it made me wonder if using that grease to make biodiesel would not be at least as efficient when used as a fuel to drive an electrical generator. In addition, there is still the methane from the wastewater that could be used to drive the microturbine. Would the net result be more electricity?

**Jeff Chadima, Houston, Texas, United States**

*Editor's comment: We obtained this response from Stephan Rank, lead project engineer at Chevron Energy Solutions (CES):*

*Thank you for your question. Our CES project for the city of Millbrae involves collecting, from restaurant grease traps, a greasy liquid that is actually about 80 percent water and mixing this directly with digester sludge to generate methane to fuel the cogenerator. The project did not explore the feasibility and relative efficiency of developing a separate process to create a nonaqueous liquid from the grease (i.e., something similar to cooking oil, a common biodiesel source) that might then be used to produce biodiesel to fuel an onsite cogenerator. Even if such a process were feasible from a technical perspective, it would not have been feasible from an economic standpoint as a second system operating in parallel with the current new system. Also, it would not have met the city's project requirements. More specifically, having two systems in parallel would have necessitated two smaller, separate cogenerators – which would involve more costly permitting and maintenance issues than a single larger cogenerator and would not have enabled the city to operate the system independently from the local utility grid if necessary.*

### **Business Backers**

The article on Jay Pryor's group [the Chevron Business Development group in "Elephant Hunters," February issue] was beautifully written – very exciting to read. Kudos to Jim Hendon for a great article.

**Heidi Pervin, San Ramon, California, United States**

Excellent article. It is truly an exciting business. Thank you for making this content available for your contractors to read.

**Michael Guardia, Cabinda, Angola**

### **Ideas for *Line Rider***

I think you guys are doing great! I know that the big stories are important for everyone, but what about the small sites and small stories? Could we include a section of *Line Rider* where local, small sites can write in and talk about what is going on in their area? The smallest pats on back make a huge difference in the confidence of local-area employees. Another idea is to start a Chevron Web page where people can submit comments or local-area announcements about people retiring, production increases, etc. Have a section where you recognize employees who go above and beyond the job scope to boost production or help their community.

**David Hodges, Deberry, Texas, United States**

***Editor's comment:** Thanks for these good suggestions. I hope we have been moving in this general direction, at least in some aspects. A few months back, we launched "Our Communities," which recognizes the good work Chevron does in its local communities, often involving employee volunteers. Our photo contest, "Where I Live," helped promote that and gave readers a chance to offer us a glimpse of what it is like to live in their part of the world.*

*We have always welcomed story suggestions about any individual or business unit achievements – so please tell us your news! While not all stories can fit in the corporate magazine, we can usually recommend the right Chevron communications vehicle for readers' ideas and help get them published.*

*As for providing a page for your comments, look out for the "Voices Message Board," starting next issue. This will enable to employees to freely express their views on many topics, starting with the one on safety publicized in this issue.*