



Line Rider

Global Employee eMagazine

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Safe Journey

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Left: An overloaded motorbike in Nigeria.



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A Global Issue

The shocking statistics, which directly affect our employees, their families and their communities, led Chevron to create the Arrive Alive program in 2004. Aimed at finding ways to help eliminate deaths and injuries among Chevron employees and contractors as well as the general public in the areas in which we operate, Arrive Alive works with partners to identify and help implement sustainable projects to improve road safety.

Chevron has operations in many countries where inferior road conditions and inadequate infrastructure contribute to a high rate of fatalities and injuries. While we make the safety of our workforce and operational excellence our highest priority wherever we do business, operations in many countries have yet to move forward with an Arrive Alive program.

The following pages show solid achievements in five countries where we've successfully launched the program. With our record of success and continued commitment to Arrive Alive, other Chevron countries of operation can establish programs by drawing on our experience and using the tools we have developed.



El Salvador: Extreme Makeover

Children are especially vulnerable in a nation such as El Salvador, in which road fatalities are on the rise. The dangers include unsafe and damaged roads, poorly maintained vehicles, inadequate street lighting, faulty traffic signals, and reckless and negligent drivers.

To help protect children from these risks, Chevron has teamed with Glasswing International to conduct an extreme school makeover program that airs monthly on national television. As part of the program, volunteers go into the schools and train students in road safety and other topics.

The charity also has donated 15,000 ruler/bookmarks, which include pedestrian safety tips. The children are invited to create murals and other drawings that depict safe and unsafe road conditions (this child's poster, left, says "Never run around or play on the street").

They're also given quizzes to assess their road safety awareness. Their test scores demonstrate that the program is working: children who took the quizzes increased their safety awareness by anywhere from 20 to 49 percentage points.



Guatemala: A Bridge to Life

Driving while intoxicated, speeding and jaywalking are among the primary road safety concerns in Guatemala City and the surrounding areas. Arrive Alive tackled these problems by partnering with ConPreve, the Guatemala Rotary Club's nonprofit organization that is gaining a national reputation for its leadership in road safety.

Working with the local transit police, the partners identified nine crash-prone locations around Guatemala City. They installed rumble strips to reduce speeds and made other safety improvements that caused crashes to decline by 95 percent.

Erecting a median barrier prevented pedestrians from jaywalking and forced them to use the pedestrian bridge (pictured). Studies show that 100 percent of pedestrians now use the bridge.

The partners also donated breathalyzers and speed radar equipment to the transit police and trained them in using the equipment.

Other cost-effective initiatives included organizing defensive driving courses for college and high school students and pedestrian workshops for children.



Nigeria: Getting Into Gear

On the roads outside the Nigerian capital of Abuja, okada (motorcycle) riders weave in and out of congested lanes, dodging overloaded vehicles and pedestrians walking in the road.

The scene is typical of Nigerian road conditions. In 2006 (the latest data available), there were 4,944 deaths and 17,390 injuries. Since 2006, Chevron has been working to improve safety in Nigeria as part of a private/public coalition with the World Bank, Nigeria Federal Road Safety Commission, the Nigerian government and other corporations.

The coalition is helping to create a safer corridor outside Abuja by promoting road infrastructure improvements, an education and awareness campaign, and increased enforcement of safety laws for drivers and pedestrians alike.

To stem the risk caused by reckless okada drivers, the coalition has worked with the government to introduce regulations that limit the vehicles to specific routes and operating hours, mandate helmets and other safety apparel, and allow one passenger per motorcycle.



South Africa: The Message Comes Alive

Pedestrians account for 40 percent of the more than 12,000 lives lost each year on South Africa's roadways.

The R300 is a key corridor connecting two major freeways in the Western Cape. It divides two residential areas, and many pedestrians have to cross the road to get to and from schools and work.

Chevron is sponsoring two programs to address the problem of pedestrian fatalities along the R300 by educating the most vulnerable users – the children.

One provides road safety education to youngsters from 10 high schools located along the road using the medium of theatre performance (pictured). Students develop performances which can incorporate music, dance and humor to convey a safety challenge and solution. Younger students, from the 22 primary schools on the route, participate in poster competitions.



Uganda: Enforcing the Law

Driving in Uganda is perilous, and traffic-induced fatalities are on the rise.

Chevron Uganda catalyzed the efforts for the foundation and growth of the nonprofit coalition, Arrive Alive Uganda (AAU). With Chevron's decision to pull its operations out of Uganda, the Arrive Alive model is being fully recognized for creating a sustainable nonprofit organization that can continue to flourish without Chevron in the leadership role.

The AAU coalition is pressing for more effective enforcement of existing traffic and road safety laws. In 2008, AAU facilitated the signing of a 10-point resolution with government and the police to address road safety. The following year, the coalition held a strategy workshop with government officials and police to develop specific actions for each of the 10 points identified in the resolution.

AAU also has partnered with the British High Commission to promote motorcycle helmet distribution and partnered with the Uganda Red Cross to train 7,550 students in eight schools.

Left: A symbolic display of shoes at a Ugandan remembrance event was a reminder of the human toll.



Positive Results, but A Way To Go

In the countries in which we have introduced Arrive Alive, our initiatives are yielding positive results at relatively modest outlays, but Chevron's not stopping there. While road traffic death rates in many higher-income countries have stabilized or declined in recent years, road deaths continue to increase in most regions of the world.

We now plan to build on our initial success with Arrive Alive by expanding the program to other countries where we have operations.

"As populations grow and prosper, more people fill the roads," says Jim Taylor, Arrive Alive global manager. "But in many developing countries, authorities are struggling to cope, overwhelmed by the horrifying rate of crashes.

"Chevron will continue its own journey to make these places safer. If we have saved just one life, it will have been worth it."



Gorgon's Greenhouse Gas Stays Down Under

How we will keep Gorgon's carbon dioxide safely locked away, deep underground.

Chevron's Gorgon Project will be the largest single investment ever undertaken in Australia. It also will make history by incorporating the world's largest greenhouse gas reduction project. Some 120 million tonnes of carbon dioxide will be injected underground instead of being released into the atmosphere.

This is an interactive feature and therefore unavailable in PDF format. The interactivity is available on the Chevron intranet (<http://linerider.chevron.com>) or you may email for more information (linerider@chevron.com).



Biofuels: Boiling Down the Options

Nature offers thousands of possibilities, but only a handful will make the right biofuels feedstock.

Michelle Long stops in the middle of a central Texas jatropha field, leans down, plucks a few pods off a plant and looks closely at them in her hand. "The fruit is too green. The seeds will not have reached maturation for oil content," she says.

These days, Long, manager of feedstock supply for the biofuels business unit of Chevron Technology Ventures (CTV), is as comfortable examining jatropha seeds as she used to be exploring ways to efficiently manufacture products from long-chain hydrocarbons. But that wasn't always the case.

A quick glance at Long's background, education and professional career shows her to be an unlikely expert in germination, fermentation and a host of other terms straight from botany textbooks. A chemist by education and training, she has spent 15 of her 23 years in the industry in refining and lubricants operations.

Long's fast ascent up the biofuels learning curve mirrors Chevron's experience to date.

That education began in 2006 when CTV – the "on-ramp" for emerging technologies coming into Chevron – was charged with launching and building Chevron's biofuels business unit. Its task was to help Downstream plan and execute its biofuels strategy based on increasing volume mandates and the need to supplement traditional petroleum-based fuels to meet increased energy demands.

"Our first task was to find out what we knew and didn't know about biofuels," recalls Jeffrey Jacobs, vice president of biofuels and hydrogen for CTV. He explains there are three major components of the biofuels value chain: feedstock, conversion and product.

"We knew a lot about conversion and product because we've been using advanced engineering and manufacturing techniques to turn raw materials into high-quality transportation fuels for more than 100 years. But our knowledge about biomass – the raw materials for biofuels – was minimal. We had to get up the learning curve quickly."

How does an oil company rapidly build organizational capability and institutional knowledge about biomass? One option – a very expensive one – would have been to staff up with botanists, agronomists and foresters and conduct all of our research in-house. But that's not the way Chevron employs technology.

"Chevron's technology strategy calls on us to focus on what we do best and collaborate with the best and brightest at universities and national laboratories to augment the areas where we need additional expertise," says Long.

CTV has formed research alliances with the Georgia Institute of Technology, University of California – Davis, Texas A&M University, as well as a cooperative research and development agreement with the National Renewable Energy Laboratory. These give Chevron access to high-powered minds and top-notch research facilities. The alliances are focused on enhancing Chevron competencies in areas such as biomass identification, characterization, cultivation and harvest.

Additionally, Chevron formed a 50-50 commercial joint venture, Catchlight Energy, with Weyerhaeuser Company, one of the world's largest forest products companies.

Before Long and her feedstock team could begin hands-on field trials of potential feedstocks, they first had to tackle the not-so-small problem of the sheer number of choices.

Mother Nature provides plenty of options: about 300,000 known plant species in total. Add to that a huge number of potential non-plant feedstocks such as algae, animal products and waste streams, and it's difficult to know where to start.

"We used a multi-year, phased approach to zero-in on the handful of feedstocks we believe hold the greatest potential to produce biomass at scale in a manner that is both environmentally and economically sustainable," explains Long. "In 2007, we evaluated 110 potential feedstocks. We eliminated all but 24 based on characteristics such as environmental impacts and sustainability of supply."

Long's team then applied more rigorous selection criteria to those 24 feedstocks. The four major criteria for passing this phase were:

Volume potential: Given the scale of our business, tens of millions of tons of biomass will be needed annually to move the needle for Chevron. The Catchlight joint venture is one avenue for Chevron to gain advantaged access to feedstock at scale.

Risk Assessment: A feedstock must be deliverable at scale on a sustainable basis – without materially affecting food or feed supplies.

Feedstock Characteristics: The feedstock must feature the right physical and chemical properties to refine into a biofuel.

Delivered Economics: Reducing biomass costs is imperative because, as with petroleum-based fuels, feedstock constitutes 50 to 80 percent of the price of biofuel product.

By the end of 2008, CTV had prioritized 11 feedstocks in two broad categories – lignocelluloses and lipids. Included in the first category are forest residues, agricultural residues and purpose-grown energy crops such as switchgrass and miscanthus. Examples of lipid-based feedstocks include algae and oilseeds such as jatropha. Some of these feedstocks are the focus of CTV's internal R&D, while others are the focus of Catchlight.

CTV is now learning where they grow most effectively in large quantities, and how to harvest and transport them cost-effectively. Of particular interest are those that thrive on "marginal" land that would not otherwise be used for food or feed crops.

"We've come a long way in three years," says Jacobs. "We've acquired a tremendous amount of institutional knowledge. From an almost infinite number of feedstock-to-product pathways, we are now able to concentrate on less than 10 that we believe can give Chevron a competitive advantage in terms of access, cost and sustainability."