Tar-sands field, Alberta: Only about 20 percent of the deposits are within seventy-five meters of the surface, so the extraction process utterly transforms the landscape. Here, the massive tailings pond is in the foreground, with the upgrader facilities of Syncrude and Suncor in the background.

KEYSTONE

WHETHER TO BUILD THE INTERNATIONAL PIPELINE, DESIGNED TO CONVEY THE TAR-SANDS OIL FROM THE MASSIVE DEPOSITS IN WESTERN CANADA TO THE TEXAS GULF COAST FOR REFINING, HAS NOT ONLY BECOME AN EXPLOSIVE ISSUE IN THIS YEAR'S PRESIDENTIAL ELECTION, IT HAS BECOME CENTRAL TO THE DEBATE OVER THE FUTURE HABITABILITY OF PLANET EARTH. A SPECIAL REPORT.

BY JOHN H. RICHARDSON

PHOTOGRAPH BY EDWARD BURTYNSKY, COURTESY OF NICHOLAS METIVIER, TORONTO, AND HOWARD GREENBERG AND BRYCE WOLKOWITZ, NEW YORK

When you arrive at night in Fort McMurray, the little Canadian town that might just destroy the world, the tiny airport looks smaller because of the snow and all the Explorers and Rangers and four-wheel drives in the parking lot. An ambitious ramp enters a highway so wide the shoulders must be in different time zones, and trucks the size of dinosaurs roar by belching clouds of steam and snow. The smaller trucks have buggy whips that hoist flags high above them so the giant trucks will notice their insignificant speck existence and avoid running over them. The giants are so large they need little pilot trucks to guide them, one ahead and one behind. Largest of all are the hauler trucks that pull hoppers piled with tons of black sand, the prize of all this furious enterprise. They look like props from *Star Wars*—you expect a turret to swivel and shoot out death rays. But what they actually do might turn out to be more deadly. Here, they gouge and siphon that black sand from deep in the earth and through an awesome alchemical process turn it into something resembling crude oil. A triumph of science and engineering. And nearby lie the beginnings of a nineteen-hundred-mile international pipeline—the Keystone XL, it's called—that will carry a million barrels of the stuff every day, down through the breadbasket of America to the Gulf Coast of Texas, where it will be refined and shipped to the emerging economic powers of the world.

Already this little burg is the greatest source of imported oil into the United States, and now it also finds itself central to the fight over global warming and the future habitability of planet Earth, which has been sending scientists all over the world into a state of increasing alarm. Recently, National Snow and Ice Data Center director Mark Serreze said arctic ice is in a death spiral and "is not going to recover." Lonnie Thompson, the world's greatest glaciologist, says, "Virtually all of us are now convinced that global warming poses a clear and present danger to civilization." As the battle over the Keystone pipeline heated up last year, the world's most distinguished climate scientists wrote a letter to Barack Obama raising a specific alarm about Canada's tar sands: "Adding this on top of conventional fossil fuels will leave our children and grandchildren a climate system with consequences that are out of their control." The signatories included James Hansen, the NASA climatologist who raised the first alarms about global warming back in the 1980s, as well as leading scientists like James McCarthy of Harvard; Michael Oppenheimer of Princeton; Raymond T. Pierrehumbert of the University of Chicago; Donald Kennedy of Stanford; Richard Somerville, research professor at Scripps Institution of Oceanography; Ray J. Weymann, director emeritus at Carnegie Observatories; and George M. Woodwell, senior scientist at Woods Hole Research Center. "I'm a scientist who really thinks that climate change is going to be bad news all over the place, so I think it is time to bite the bullet and go off to the renewables in a big way," says Richard A. Houghton of Woods Hole. "I'm not spending my life on this because it's an interesting curiosity," says Princeton's Oppenheimer. "I think this problem is among a very small handful of problems that need to be solved, and if not solved correctly will head the human endeavor in the wrong direction."

But the giant trucks keep rolling, more and more every day. So you slip your little sedan into their wake like the humblest of pilot fish, happy to suck their exhaust pipes in exchange for protection. Windshield wipers flap away the snow until you eject at your hotel, which has a parking lot filled with slush and snow but a tropical jungle in the lobby with a stream that curves around the chairs. The stream is stocked with ornamental carp, golden advertisements for the good life, every last one imported from a soft and temperate place very far away.

Are they grace notes in a harsh frontier or a sign of the impending apocalypse? You must choose one. You cannot choose both. This is the challenge of Fort McMurray, the secret engine of the modern world. Can it be fixed? Must it be stopped? Can it be stopped?

Over the next twenty-five years, Fort McMurray is projected to pump $1.7 trillion into Canada's economy. Its enormous resources will radiate wealth across the world, first to America, then to China and Europe, literally trillions of dollars more—Canada estimates $45 billion a year in the U.S. alone and half a million jobs by the year 2035. The amount of human suffering this will reduce—and human joy enable—is incalculable. Liberals and environmentalists who scoff at the ten thousand or twenty thousand short-term construction jobs required to build the pipeline itself seem to have failed Capitalism 101.

George W. Bush was right—the world is addicted to oil. We consume thirty billion barrels of it every year. And the tar sands of Alberta are now central to any discussions of future supply. Yet threats against the tar sands are gathering everywhere. In Europe, a blunt and forceful Danish politician named Connie Hedegaard has been pushing the European Union to label the stuff "dirty oil," subject to penalties as a threat to the climate. In the United States, environmentalists began organizing global campaigns that climaxed in the summer of 2011 with ten thousand people surrounding the White House. When President Obama responded with an order to delay the pipeline and requested a new environmental study, the dispute exploded into an epic election-year fight over capitalism itself—Speaker of the House John Boehner accused Obama of lobbying for China, Newt Gingrich promised to get gas down to $2.50 a gallon, Mitt Romney accused Obama of not caring about American jobs and said, "I will build that pipeline if I have to myself." Even some of Obama's labor allies rebelled. The United Association of plumbers and pipe fitters broke from the labor movement with a pro-pipeline campaign, on and on in an ugly spiral.

In Canada, the fight is even uglier. In 2008, the death of sixteen hundred ducks in a toxic "tailings pond" led to federal and provincial charges of environmental crimes against a major Canadian tar-sands player, Syncrude, which paid a $3 million fine. Environmental groups and the media milked this relentlessly, and leaders of the First Nations—Canada's Indians—in the west have vowed to stop the Northern Gateway pipeline at all costs. There was even a spate of bombings along one of the western pipelines. On the far right, there's a virulent campaign to compare Canada's "ethical oil" with terrorist oil produced by Arabs while powerful right-wing politicians conduct a formal parliamentary inquiry into foreign-financed "radical environmentalists." One senator fumed about Canadian environmentalists accepting support from suspect groups like Greenpeace and the Sierra Club: "Would they take money from Al Qaeda, the Hamas, or the Taliban?"

With so much at stake, the Canadian government sends one official after another to sit among the palm trees and gliding carp and make its case. Randall Barrett of the Alberta government's Ministry of Environment brings a slide show about water permits and air permits, Canada's Sustainable Resource Development plan, and the Energy Resources Conservation Board. Kevin Percy, Ph.D., comes to describe a rigorous air-monitoring program with fifteen ground-level air stations and eighty-four state-of-the-art air analyzers. Many of these are a result of Directive 074, a set of stringent new environmental regulations passed in the wake of the dead ducks. The president of Shell Canada calls just to say hi. All have the same basic message, a plea for simple realism.

By 2050, the global population will grow from seven billion to nine billion. Energy demand will double or triple. "Easy oil" is running out, leaving no alternative to the tar sands. Canada is a stable, civilized country that's doing tremendous things on conservation. And Canada is going to sell this stuff one way or another no matter what—if the U.S. stops the XL pipeline, Canada will just ship it out in tankers. Imagine the greenhouse gases that will cause!

Barrett flips to a chart. "People hate it when I bring this out," he says.

Wastewater pours into a tailings pond at the Syncrude open-pit tar-sands mine in Fort McMurray, Alberta, Canada. Because the tar sands are a solid and can't be pumped like oil, the process of extraction takes a heavier toll on the environment.

It shows CO_2 emissions worldwide. All of Canada produces just 2 percent of the world's emissions. The oil sands produce just 0.15 percent.

Point one five? Really?

Yes, Barrett says. Point one five! Almost nothing!

No wonder the residents of Fort McMurray feel so frustrated and misunderstood. Over at the Suncor Community Leisure Centre, just to give them a chance to vent, a Canadian radio and TV personality named Rex Murphy sets up his microphones next to an enormous indoor water park. "Do you ever get the idea that all the bad publicity is an attempt to make the town a symbol?" he asks.

Oh, yes, says Mayor Melissa Blake. "We take it personally."

Like what, for example?

She mentions all the do-gooders with their glossy images of devastation as far as the eye can see.

"Would you rape the earth and despoil traditional lands and say That's great, I'm getting a paycheck?"

"Certainly not!"

For two solid hours, indignant residents take turns at the microphone. Michael says he recycles and drives a diesel and feels like he can do more good for the environment inside the industry than outside. Howard says that these self-appointed environmentalists are no better than tabloid journalists. Mark says that people here are focusing on solutions, not standing on the sidelines complaining—in the last few years Suncor has planted more than five million trees and reclaimed a tailings pond, which environmentalists said was impossible. They're Canadian, for God's sake. Everybody knows this is the most highly regulated place in the world, where a company can't survive if it doesn't earn its "social capital." And unlike certain countries to the south, Alberta actually has a carbon tax. The nerve of some of this finger-pointing!

Despite all that, Brenda was afraid to tell her friends she was moving here—people just hate the place.

"Are you a villain?" Murphy asks.

"I'm not," Brenda says. "We provide an essential commodity. . . . Canadians should be proud of what we do here."

Murphy says to Blake: "You have family, you have children?"

"The air we all breathe, the water we all drink, is important here as anyplace in Canada," the mayor says in a soothing voice.

To the critics of the oil sands, all of this is naked boosterism and bad science. Bus drivers here make more than $100,000, they point out. Heavy-haul truck drivers make $200,000. One local high school has a $3 million science facility donated by oil companies. Another shares the 350-seat Suncor performing arts theater, which has cutting-edge acoustics and a $60,000 set of curtains. And thanks to capitalism, local health care is a marvel of socialism—just show your provincial card and the copay is zero. The bill that comes to your house is zero, too. Of course all these people are going to praise the oil. Of course the government and the oil companies jump through hoops to make sure their immediate environment is clean. Did they mention that Percy's air studies are designed not to measure gases that cause global warming? Did they mention the cancer clusters in Fort Chipewyan?

If you really want to see the true face of the tar sands, the critics tell you, that's where you have to go. In that remote outpost where the toxins flow, you can see the future of the world.

The winter road is melting early this year, so the safest way to get to Fort Chip is by plane. This one is tiny, just four seats.

This tiny plane also happens to be the best way to see the tar sands, which are spread out over a vast area the size of Florida. Up ahead is Albian, Shell's giant open-pit mine site. Over to the right is another huge mine called Firebag. The ground below is all black and crawling with giant machines, just like Earth in the opening minutes of *Terminator 2*.

A hundred million years ago, this was an ocean. Fifteen thousand years ago, glaciers covered it. Then the earth warmed, the oceans rose, and now the mine goes down in ridges hundreds of feet deep, the setbacks carved with giant shovels to keep the slopes from collapsing. Black roads branch into capillaries that end in square parking lots. Enormous round tanks dot the landscape.

From above, in the snow, it looks like a giant electronic circuit.

There's the giant tailings pond, which is actually the largest dam in the world. Built right against the river, it looks like a giant triangular rice paddy.

In the distance, a steaming factory rises up out of the endless forest. That's the Syncrude upgrader, the pilot says.

"I hate flying over these things," says a passenger in the back, an environmentalist named Eriel Deranger. "It's like living in a war zone."

Deranger's family is from Fort Chip and she now works with a group called the Indigenous Environmental Network. She says the government did water studies in the fall and winter, not when the spring melt releases the accumulated contaminants, but there's a devastating new study by David Schindler of the University of Alberta that finds every spring melt is the equivalent of an oil spill. Not that anyone had to tell the people of Fort Chip—all you have to do is look at all the deformed fish, which have tumors the size of eggs.

Forty minutes later, the oil sands fall behind and the plane begins to cross a shimmery trail of streams and bogs that gleam like mercury in the sunlight. The river curls back on itself, coil after silver coil shimmering off into the horizon as far as the eye can see.

This is oil sands, too, slated for destruction.

The Indians do a healing walk at Fort Mac every year, Deranger says. Last year, everybody got sick.

Clockwise from above: In a series of protests against the pipeline at the White House last year, a thousand people were arrested, including NASA climatologist James Hansen; wildlife trapped in Syncrude's tailings pond; the Republican leadership has framed the fight over Keystone as a fight over capitalism itself.

The plane lands in a desolate field. The terminal is smaller than many gas stations. There is no hotel, just a pair of bed-and-breakfasts and a burger joint run by an ancient Chinese woman named Mah, the descendant of two brothers named Mah. You head over to the community center to meet another local environmental activist, a guy named Mike Mercredi, but the suspicious old lady at the door says that you're not welcome here. You can come in, but you can't talk to anybody.

When Mercredi shows up, the old lady throws him out, too. "I don't know what the hell her problem was," Mercredi says, driving away in his truck.

Turns out the community center was booked for a healing ceremony for natives who were taken from their families and sent to government schools. Frustrated, Mike pulls his truck into the town's only gas station.

He can't talk anymore, he says.

A moment later, he pulls away.

Hours pass. Finally, a skinny guy named Lionel Lepine shows up. Ever since their chief filed a lawsuit against Shell Oil, Lepine explains, the town has been torn between people who work in the tar sands and people who hate the tar sands. "Everybody's scared to talk," he says.

His house is just a couple of blocks away. Inside, a couple of toddlers watch a big flat-panel TV. Lepine sits down at the dinner table. The oil companies come to town all the time, he says. They're here today giving a presentation at the high school, telling the kids all they need is their degree and they can make a hundred grand driving a truck. They never say, "Come get a Ph.D. and design a truck." And if you go against them, he insists, they keep track. You won't get hired again. Maybe your cousin won't get hired. That's how they control people. For years, Lepine drove a heavy hauler for Suncor, living the boomtown life in Fort McMurray. His turning point came when his family doctor, John O'Connor, became alarmed about a surge in cancer and talked about it on the radio. The government threatened to pull O'Connor's license and brought charges against him for causing "undue alarm." Lepine quit his job and joined the campaign against Shell and BP. He appears in a new Canadian documentary called *Tipping Point: The End of Oil,* which focuses on Dr. O'Connor and the fight over his license and the subsequent discovery of rapidly increasing levels of thirteen toxic chemicals in the river—arsenic and lead up fourfold near oil-sands development, mercury up eightfold downstream of tailings ponds, etc. At first, the government said those chemicals must be naturally occurring, since the Athabasca River flows right through the tar sands. Then doctors from the University of Alberta found leukemia and lymphoma at rates four times the average and bile-duct cancer six times higher. A 2009 study done by the Alberta health department concluded that Fort Chipewyan has a cancer rate 30 percent higher than the rest of Alberta. Out of twelve hundred citizens, according to locals, Fort Chip has lost more than a hundred people to cancer and rare autoimmune deficiencies. Canada has given itself a few years to come up with an official response while continuing to green-light more production.

"We're surrounded by these people that only see one thing here, which is money," Lepine says. "They don't see the beauty, they don't see the tradition we're trying to protect, they don't see the fresh snow on the ground. As far as they're concerned, this is all just the jackpot that they hit. Because every single resource that's considered precious to the white man is located right here in northern Alberta. You've got uranium, you've got gold, you've got diamonds, iron, oil—you name it, we've got it. We're sitting right on top of everything. And they want it all. They want every ounce of it today, right now."

Later that afternoon, Lepine gets a visit from the chief of the Chipewyan Dene tribe, Allan Adam. A solid guy of forty-six with a gray ponytail, a scar on his cheek, and a worried expression, Adam also did a stint working for Syncrude. Like Lepine and Mercredi, he came away with zero confidence in the good intentions of the oil industry. "I stated this publicly," he says. "There's an act of genocide being done to my people when it comes to poisoning our water system and poisoning our air. It's corporate genocide, that's what it really boils down to." The tribe has sued Shell, but frankly the problem seems overwhelming—the animals forage the land, toxins concentrate in their flesh, people eat the animals. "When you look at the whole scope and everything, what do you do? Initiate court challenges? Put pressure on the government? Put pressure on industry to change their ways?"

The fact is, they'll never get back to hunting and fishing in the traditional way. All of that is over. "The majority of the people who say it's good, they're profiting from it," he says. "But we live it and see it and breathe it."

The chief offers a ride to the airport. When he pulls into the parking lot, he lights a cigarette and says nothing for a few minutes, then he sighs. Another member of his tribe comes to the window. "You know what he's going to write in the magazine? 'Chief was idling his truck.'"

"And smoking a cigarette," the chief adds with a wry smile, tapping his ashes into the wind.

Should Los Angeles not take water from the Owens Valley? Should all the world's gold have stayed in the ground? *The world needs this oil,* the realists say. Progress always causes pain to someone. In the struggle to extend the benefits of the modern world to the hungry billions in India and China, maybe Fort Chipewyan represents little more than the lament of the losers.

The answer begins at Shell's great Albian mine. Three inches of snow has snarled all the traffic in and out of Fort McMurray, surprising no one because there's only one road. A Shell PR lady says they're finally twinning the darn thing all the way from Edmonton, 435 kilometers, and they can't do it fast enough.

On the outskirts of town, our little sedan crawls past big mine-service companies with names like MinePro and Tyco, past the lot for the Diversified buses that ferry workers to the camps. The area looks like an airport feeding zone, scaled larger than regular human size. Then the buildings fall behind and you're driving through the jack pines, the trembling aspen, birch, and low brushy patches of black spruce.

By the way, the PR lady says, the stunted look of that spruce has nothing to do with pollution. Like everything that lives, this forest has made its own trade-off between its energy resources and its energy needs, the endless ratio of leaf and root.

Below, the Syncrude upgrader, where the tar sands are turned into synthetic crude. The government of Alberta notes that only 0.15 percent of the world's CO_2 is created in the process, ignoring the fact that 80 percent of the resulting fuel's total CO_2 comes from burning it rather than producing it.

A coyote darts across the road.

To the left is Fort McKay, the tribal reserve where some visionary First Nation leaders decided to work with the industry way back in the late sixties when squeezing oil out of tar sand was experimental and Suncor was shipping out barely twelve thousand barrels a day. But they grew with the industry and now their group of companies earns more than $100 million a year—a great example of the good things that can happen if you choose to work with the oil companies instead of fight them.

McKay falls behind. Next is the Firebag mine, then Husky Sunrise, and finally Albian, a vast tract that includes the Muskeg River Mine and the Jackpine Mine. We turn right onto a wide dirt road. The trees are clear-cut for miles, bulldozed to dirt and stumps.

In Shell's corporate scenarios, the rise in global population and the modernizing people of India and China will double the world energy demand if we practice conservation. If we keep using energy at the same rate as today, they expect demand to triple. Shell's job is to meet that demand and this is how it plans to do it. Here, for example, is one of the largest private airports in Canada. Shell Global Aviation runs it. When the shift changes on Wednesday a lot of people fly in and out, twenty-two hundred employees and four thousand contractors in all, average age forty, 11 percent women and 4 percent aboriginals—but they'd really like to get that number up.

There's the camp, which looks like a nice public school. It has a Tim Hortons and a gym. In the parking lot, every parking space has wiring for a heater to keep the engine block from freezing. All the cars park nose out and signs indicate the nearest mustering point for evacuations.

They're sniffy about safety here. No hands in pockets, hold the rails, goggles and gloves, collision-avoidance mirrors in the halls. Honk before exiting your parking space.

There's a Ford service center on the lot—they have five hundred light trucks in operation at any one time.

And here's a garage tall enough to park an ocean liner, spotless as an operating theater. This is where they service the giant dump trucks. One sits in the dock with its bin splayed open, three guys in coveralls climbing around its silver hoist cylinders with giant-dump-truck toothbrushes.

Everybody loves the dump trucks. Something in those immense tires renders every man twelve again—the sheer power, the noise, the energy, and the perpetual explosions that drive those giant cylinders. The poet William Blake wrote, "Energy is eternal delight," and drew luminous paintings of radiating Jesus rays. Shell hands out its press materials on a memory stick shaped like a giant truck.

How big is it? A regular highway dump truck carries 12 to 15 yards. This thing carries 350 yards. The tires stand twice the height of a man and weigh twelve thousand pounds each. One set costs $1 million.

Climb the ladder to the cab and the controls look beat-up in a steampunk way, a set for a video game. An old green screen displays the feed from a side-view camera and a backup camera, a vehicle-information monitor that looks like it came from a B-2 bomber. The hatch is open, exposing engines the size of killer whales—double 12-cylinders that pump 3,500 horses each. The exhaust system is the size of a public sewer. Each shovel lifts a hundred tons. *Hail mankind and all its wonders,* you think.

3.3 MILLION BARRELS A DAY. The projected threshold of Canadian oil-sands production at which there's only a fifty-fifty chance of keeping CO_2 in the atmosphere from reaching a level most scientists believe would dangerously warm the earth in this century.

5 MILLION BARRELS A DAY. Projected level of production at the tar sands, including new projects announced or in application, over the next two decades.

But these are only pieces of the whole. The mine itself is closed to the public. Even if you could float with the birds to look down on electric shovels, which stand seven stories high, you'd have to follow the dump trucks to the giant rock crushers and watch them grind those huge mouthfuls of rock down into sixteen-inch chunks, then follow the chunks down one of the largest conveyor belts in the world—it plods on for a full mile—to the next step in the process.

The great tailings pond is closed to the press, too. The best you can get is a sense of scale. After a guard checks everyone's badges—she's a punky young person with a nose ring, which is more common up here than you might expect—the little car passes miles and miles of the giant truck tires stacked two tires high, then an artificial hill made of piled-up overburden that stretches as far as the eye can see, then a power plant big enough to run a city. They use huge amounts of natural gas to extract the oil, which is one of their largest sources

THE KEYSTONE XL PIPELINE

THE ANSWER TO ALL OUR ENERGY NEEDS, OR "GAME OVER" FOR THE EARTH'S CLIMATE?

The Canadians have spent the past century figuring out how to turn the tar sands into oil, but it wasn't until the price spikes of the twenty-first century that Canada's oil industry exploded almost overnight into the largest industrial project in the world. With reserves estimated at 170 billion barrels, the sands now generate more than 456,000 jobs in Canada and—at 1.6 million barrels a day (with plans to increase to 5 million)—already represent the largest source of imported oil for the United States. Unlike drilled oil, the tar sands are much more difficult to get out of the ground, and the resulting oil burns much dirtier than even the heaviest crude. That's where the controversy comes in.

EXISTING PIPELINE

PROPOSED PIPELINE

MAP BY BRYAN CHRISTIE DESIGN

FORT McMURRAY
ALBERTA, CANADA

With deposits covering a forested area (shaded) the size of Florida, Alberta is the Saudi Arabia of tar sands. The Canadian oil company, TransCanada, has been pushing for the completion of the pipeline to the Texas Gulf Coast to facilitate refining and shipping to the rest of the world. Most of the pipeline has already been completed, with President Obama recently approving construction of the remaining southern section, from Cushing, Oklahoma, to Port Arthur, Texas, a move that greatly upset environmentalists.

ALBERTA–NEBRASKA

This section is what the current fight is about. After objections from ranchers, Indians, and environmentalists, President Obama withheld his approval, ordering further environmental-impact studies.

OGALLALA AQUIFER

Covering parts of eight states, the source of drinking water for millions of midwesterners, and a major source of opposition to the pipeline from ranchers and environmentalists.

CUSHING, OKLAHOMA

The current terminus of the pipeline, resulting in a significant glut of oil in the region. Good for local consumers, as it keeps prices lower, but bad for the oil companies.

CUSHING–PORT ARTHUR

In March of this year, President Obama announced his approval for the 435-mile southern section of the pipeline, confounding Republican efforts to paint Obama as anti-pipeline.

PORT ARTHUR
TEXAS

Together with the Houston-area refineries, this is the oil-refining capital of America. A working-class town, Port Arthur is experiencing a boom in anticipation of completion of the pipeline, with a $10 billion expansion to the Motiva refinery and more than $3 billion in improvements to the Valero and BASF Fina plants. Oilmen will tell you that tar sands are only 5 to 15 percent more polluting than crude, but some scientists put that number as high as three times as dirty.

of global-warming gases.

Why is it all so spread out? Because each grain of the black sand is covered with a film of water and then the precious oily substance called bitumen, a young scientist named Nicolette Stanley explains. The challenge is separating the sand and water from the bitumen. Shell uses a series of rotaries, filters, flocculants, and froth treatments that each seems to require a separate industrial installation of its own. That enormous refinery over there, she says, does nothing but solvent recovery. Shell is especially proud of its cutting-edge "hydrogen-addition method," a complex chemical process that renders 103 barrels from 100 barrels of bitumen compared with 80 barrels from the old coking method most companies use. After all that, the stuff still has to go to another huge facility called an upgrader to "de-asphalt" it into something close to crude oil.

Stanley stops the car at a new tailings pit, which looks exactly like an empty mine except for a spout the size of a culvert that gushes a thick column of black water. A hundred fifty feet below, the black water pools into a dismal gray puddle. "In the media," Stanley says, "you always see the pipe and think it's being released into the natural environment. But there's no release into the natural environment."

These tailings ponds have bentonite clay walls that stop seepage, she explains. And if any toxins do get through, they have elaborate monitoring that catches them and pumps them right back into the pond. And eventually this pit will be filled in and contoured into hills and valleys—it won't be the same as it once was, they practice reclamation not restoration, but they're not just thoughtless pigs ravaging the land.

Stanley has a sweet, sincere manner and a big head of curly girlish hair, and it turns out her parents were big hippies who make their living as potters. Water quality is her passion, she says. "I call it a litmus test."

The way she figures global warming, Shell's hydrogen-addition method puts it at the low end of emissions already. Also, it has proposed a carbon-capture-and-storage operation that will bring its carbon down to the level of normal oil—expected to start in 2015. And it recycles 98 percent of its waste. It even has a full-time wildlife technician. Even if it weren't committed to doing the best job it can, which it is, it's regulated closely by government regulators who are sincere about protecting the environment.

In Nigeria, though, Shell supported a government that killed indigenous protesters. Sometimes the soldiers wore Shell logos on their uniforms. Can you really trust a company like that?

Stanley thinks for a moment. She admits she can't know all the things a company as large as Shell might have done. "Ultimately," she says, "I'm responsible for my own behavior."

But the great open-pit mines of Albian amount to a colorful side issue, because only 20 percent of the tar sands are near the surface. The future belongs to an astonishing process with the dullest possible name: "in situ."

In its natural form, bitumen is hard as a hockey puck. It sticks to sand, it sticks to clothes, it sticks to boots, but it does not flow. That's why they called it "tar sand" until the industry launched a rebranding campaign to name it "oil sand." So the problem facing Fort McMurray's pioneers was how to suck a billion hockey pucks through the solid earth.

They came up with an audacious process they called "huff and puff." Basically, that meant driving a pipe hundreds of feet into the ground and pumping superheated steam through the earth for a few months, then reversing the pumps and sucking the softened bitumen up like malted milk through a straw.

Now picture doing that when the temperature is 50 below.

The latest and greatest in situ site is owned by Statoil, Norway's state oil company. Built to replace Norway's dwindling resources in the North Sea, it lies an hour south of Fort Mac at the end of a wide and splendidly maintained dirt road that tracks the progress of three large pipelines up and down the hills and valleys, arriving miles later at a small flat work building surrounded by a parking lot and a high fence. It's as bland and ordinary as an office park.

A handful of executives and engineers suit up in hard hats and thick blue winter coveralls with fluorescent safety stripes, then drive along the silver pipelines to a clearing in the forest. A row of five pumps, each about the size of a large man, sits in front of some support structures that seem to be mostly pipes.

Each pump has two robotic arms that drive steam into a pipe, not much bigger around than a coffee can, that disappears deep into the ground and then levels and spreads out for half a mile.

Instead of huff and puff, the Statoil method drives a second pipe, with holes in it just like the leach field of a septic tank, about twenty feet deeper than the first. The melted oil drains into this leach pipe, which is set on suck instead of blow. They call this SAGD (pronounced "sag-dee"), short for Steam Assisted Gravity Drainage. The guys in the control room control everything, injecting enough steam to balance the amount of fluids they're pulling out, always careful not to dip into the water table. The whole process requires only 105 employees and gets 55 to 60 percent of the bitumen, a huge improvement over the 20 or 30 percent generated by a conventional well. "So the key thing you can take away is," says a manager named Tom, "I'm making five thousand barrels of oil a day off this well pad. And these pads will last anywhere from eight to twelve years. And there's no decline rate."

It takes a truck many stories high to transport the tar sands to production. A regular highway dump truck carries 12 to 15 yards. These trucks carry 350 yards. The tires alone stand twice the height of a man.

Alas, low impact though it appears, the in situ method generates twice as much greenhouse gas as surface mining. All that steam comes from a steam-generation plant that runs on natural gas, and they burn a lot of gas—putting out an astonishing sixty to seventy kilograms of carbon for each barrel of oil. That's what it takes to warm up miles and miles of frozen dirt in one of the coldest places on earth, and that's why it takes more than three times as much energy to extract this stuff as it does to extract regular oil.

Here, have a look though this small and very thick window—that's a steam generator pumping 250 million BTUs an hour. It's like looking straight into a jet engine. There are three of these operating 24/7. And the carbon rises to the heavens.

Yet after all of this, we have seen no actual bitumen. In some ways, the entire mining process seems to be an elaborate method for using pipes and trucks and conveyor belts to separate people from any actual bitumen. The joke is, they work so hard to get the stuff out of the ground, but if a drop hits the ground, they call out the hazmat team. We are joined only at the end, in the joyful consummation of combustion.

So what does the damn stuff look like?

I'll show you, Tom says.

In a long rectangular building with lots of tubes, he opens a faucet at a station and fills a paper cup with pure bitumen. Thick as melted chocolate, it smells like tar.

"That's our product," he says.

To the touch, it's lighter than it looks. Mix it with liquid natural gas and it flows. This is what goes into the pipeline under the name "dilbit," short for diluted bitumen.

"That's what it looks like," he says. "That's what all the fuss is about."

Awe seems the appropriate response. This greasy black gunk with the protean powers of money itself, able to metamorphose into everything from my iPhone to the fancy petroleum-based REI jacket I am wearing, a staggering combination of chemistry and human ingenuity.

And yet, according to one credible and centrist study, if Canada caps the oil sands at 1.6 million barrels a day, the world has only a 50 percent chance of keeping CO_2 in the atmosphere below 450 parts per million—the target most scientists think will keep the earth from warming more than a few degrees in this century. Current approved flow is already 1.6 million barrels a day. Projects in construction bump that to 2.3 million. Projects announced or in application send it to more than 5 million barrels a day. So the bottom line is:

If the production of oil sands keeps on growing at the rate it is now growing, the temperature of the world could go up 11 degrees by the end of the century.

You look down at the cup, a sludge the color of hot chocolate. Is this the way the world ends?

A cup of apocalypse? Is that what you're holding? Funny you should ask. "Climate is my passion," says a young Statoil executive named Dan Zilnik. Leading the group back through the main building, past the gym with its squash court and a little Starbucks, he starts right in where we left off: "In the most aggressive scenario, if we're going to keep the climate under 450 ppm, hydrocarbons are still somewhere around 16 percent of the global-energy mix."

The statistic about the CO_2 produced by the tar sands being only point one five is essentially meaningless, he readily admits. The whole point of oil is that most of the carbon—80 percent—is released when you burn it. But according to the polluter-pays principle, Statoil can be responsible only for CO_2 generated in production. That's why it has put out targets of a 25 percent reduction in intensity by 2020 and an additional 15 percent to 40 percent reduction by 2025, because each person has to be responsible for his link in the great chain of energy.

It makes sense, right? The sovereign individual, responsible but free, legislates reality through a million momentary choices. It's the essence of democracy, the Enlightenment, of America itself, very similar to the honest answer Nicolette Stanley gave about Shell and the Nigerian army: "Ultimately, I'm responsible for my own behavior." And Zilnik, like Stanley, seems like a very decent person.

So why does the CO_2 keep rising?

"I can only be responsible for myself," Zilnik says.

This time, though, the addition of a single word changes the meaning completely—the word *only*.

The last stop on the tour is Syncrude's reclaimed tailings pond, the first ever, finally fulfilling forty years of research and promises. It has its own very pretty blond PR lady, who walks you through the snow to the top of a small hill overlooking a field and a stand of pine trees. Environmentalists may gripe about the details, but this is a long way from the ravaged pit you saw filling with black water. Look—a coyote running along the tree line!

Wonder why it took forty years to solve the tailings problem? Here's Alan Fair, a scientist who worked on tailings for Syncrude for thirty-two years. "You can argue we should have figured this out faster, but…"

He pauses, and history fills the silence.

"Directive 074 was issued on February 3, 2009. It provided much more rigor in terms of how tailings had to be managed."

Fair seems like a decent guy. He's executive director of the new oil-company environmental cooperative, COSIA. He starts to talk about all the new breakthroughs waiting in the wings, five hundred new ideas he has to narrow down, and he sounds genuinely excited. He's not surprised when you bring up Exxon, one of Syncrude's largest owners. For years, Exxon has been denying that it has funded global-warming denial groups while getting caught funding global-warming denial groups.

"I read the same things about Exxon as you do," Fair says, his voice resigned.

He knows that he himself has always used science for good, to improve the environment. He can take responsibility for his own work. But it's not a great feeling to think that the world thinks you work in a bad place. One of his daughters recently finished her master's degree in reclamation science, and she teases him: "Somebody had to go into an environmental field and fix all the wrongs that your companies do."

And he says the same thing every father ends up saying. "Wait a second, young lady, guess what company financed your education?"

Mayor Melissa Blake waits in her office in the Fort McMurray municipal building. She's wearing a stylish white jacket, with a long ponytail pulled to one side, an engaging smile but a no-nonsense manner.

She sits crisply down at a conference table in front of a window that looks over the downtown, a few hotels and a casino and a string of shopping strips. The turning point, she says, was the unfortunate incident when Syncrude's noise cannons messed up somehow. "It took sixteen hundred poor little ducky lives, and my God, we were all feeling awful."

She knows the people who were responsible for the sound cannons and they were heartbroken. They're not out to hurt ducks or to hurt anyone else. But it happened, and surely it's a bad thing.

"They also faced very significant fines," a staff member injects. "What were they, one million something?"

Blake nods. "Sure. But his argument's going to be, that's just money to an oil company. They pay those fines. Whatever."

You ask about the First Nations and their resentment about development, but she brushes it off. "I sit here and I respond to people like you all the time: What is it about this place? What is it about the people? Well, they're bigger. They're braver. They're bolder. They're more prone to succeed. They've got this drive and determination."

On the Rex Murphy show, you say, the only critics were on the phone.

"I'm prepared for some of the extremism that comes to the phone calls, people who've never seen the place," Blake answers.

But Christine from Red Lake seemed just like an ordinary housewife, you say. And Fort McMurray does put a big burden of greenhouse gases on the wo—

"Bullshit," she says. "We're not the end of the planet. We're a contributor to the energy needs that the economy is demanding."

She goes on, the edge sharper in her voice. "You're going to get it from somewhere. I can have a plug-in Chevy Volt, but guess what? If I'm getting my power from a carbon-induced electrical supply, I'm not doing any better for the environment than driving a standard gas-combustion engine." She talks about the problems with batteries, mentions the study in which burning all the oil sands would raise the planet's global warming by less than 0.36 degrees. "Look at coal—let's burn up all the coal on planet Earth and see what happens. Fifteen degrees! Holy cow!"

Her point is we all have to make the right choices for the planet to be livable in the future. "Instead of a little mayor in northern Alberta saying, 'No more plastic bags; they're bad!' How do I get the whole nation to do that? How do I get the whole planet to do that?"

Once again, the responsibility for saving the world seems to come down to everyone and no one. So you try out a suggestion Chief Adam made—how about slowing down the growth? How about waiting for some of these technological breakthroughs to arrive *before* we extract the oil?

Not going to happen, she says. "I think that the energy is the enabler for that better future."

Keystone

It isn't fair to go to a strip club and characterize a whole community through a bunch of drunk truck drivers and the tired blond in heavy makeup who says, "Want a lap dance? I'll rub my boobs all over your face." But that's the thing about the id, it speaks the truth, and the true spirit of Fort McMurray really does seem bright within this grinning dude named Patrick, who flops down in the next chair and says, "You're my new friend!"

Patrick was born right here in town and just spent twenty-one days in a dry camp. It's like getting out of prison! "Do you smoke?" he asks. "Do you want to go out for a smoke?"

Out in the parking lot, stamping feet in the cold night, there's a hot girl talking trash about some local hockey team that hasn't won a game in like a thousand years. Patrick looks astonished and then delighted. "You bitch!" he says. "I like you."

The girl standing next to her says, "Give her some money and she'll like you, too."

Patrick loves this place. He's making great money, and he has to drive the truck only four hours a day, the rest of the time he sits in a warm shack watching TV. When the waitress comes by with a tray of shots, horrible things flavored with grapefruit and kumquat and cilantro, he buys a round just for the hell of it.

But when the waitress comes back for round two, she won't take U. S. dollars.

Patrick smirks at the bills in your hand. "That doesn't even look like real money," he says. "That looks like play money."

There's a cash machine, but it won't take a debit card from the U. S. You go back and tell Patrick you're heading out to find a friendlier ATM.

"I'll change some bills for you," he says.

You hand him a couple of bills. He laughs at them. He pulls out a Canadian bill threaded with gleaming stripes of high-tech bullshit that flash in the spinning lights. The Canadian hundred is plastic now, he says, it won't even burn. "Yours are so old and sad. They look dirty."

"That's the reserve currency of the world," you say.

And finally he throws it in your face, the thing all these turbocharged modern Canadians are holding back, the thing they are not quite drunk enough to say:

"Used to be," he says.

Enough of Fort Mac. File it under "litmus test." File it under "social license," to be considered later. The real decisions are made in the executive suites and government offices of Calgary, Edmonton, and Washington. On a high floor of a tall modern building spun from light and glass, floor-to-ceiling windows look over the words HUSKY and SHELL and CHEVRON glowing in the morning mist, transforming a cozy downtown Calgary scaled by the era of trains to an Olympus for the age of oil.

Lars Christian Bacher slips into the room. He spent seven years on drilling platforms in the North Sea and came away with a quality of calm, focused competence. He gets right to the point: "If you want to do something about greenhouse-gas emission, put a price on carbon."

Bacher is unusually forthright for an oil-company president, which is one reason Statoil makes itself available to the public. "We don't question the global-warming issue as a company," he says. "If you look at the temperature rise and the CO_2 content historically, it's a perfect aligned correlation."

He acts as if this is normal, as if that aligned correlation has not been attacked by right-wingers and oil-company-funded publications for years. In fact, there are copies of *Oilweek* magazine right in his lobby that attack the usual "radical environmentalists" with their Luddite schemes to thwart progress, and his professional association almost certainly contributes to conservative politicians who fight carbon taxes.

He shrugs off all that as a mere distraction, the chatter and fuss of the world as it exists. "We need, I think, to reach a 2 degree target for an increase to the global temperature, so we need all the improvements from an energy-efficient point of view that we can get. We need all the renewables that we can get."

One reason he talks this way is because he's from Norway, where the price of carbon is about fifty dollars per ton and the continental shelf is among the oil regions with the lowest emissions. Statoil has learned that it can live with a price on carbon fairly administered. Regulation works, he says.

"But it still will not be enough," he adds, pointing to your digital recorder. That's hydrocarbons. Same with the glasses. And the cell phone. And the ridiculously modern Neo jacket from REI.

The problem is price, of course. Alberta's tax is fifteen dollars a ton. The U. S. has none. But to make carbon capture and storage—everyone's favorite magic bullet—financially worthwhile, the global tax would have to rise to a hundred dollars a ton.

Did you hear that? *A hundred dollars a ton.*

So here in the real world, Statoil runs the cleanest operation that is economically practical. And things are changing so fast. "If we were to look in a rearview mirror and look five, ten years back in time," he says, "this was a totally different industry."

The iPad is a cool product, for example, a beautiful product. They have a lot of cool stuff in the mining industry, too, they just can't display it in a shop for people to buy. He pulls a titanium-alloy valve out of his pocket. When he was head of operations in the North Sea, this was his baby. It's called an automatic in-flow control-device valve, and it took three years to crack. It's the size of a chewing-tobacco tin. They're going to try it in Fort Mac next year. If it works, it will cut greenhouse emissions in the in situ business by 10 percent—one valve.

He seems like a really good guy. Does he have children?

"I have two kids," he says.

And what will he say to them if the world doesn't stop at his 2 degree target for temperature rise? If the storms get worse and the oceans rise? If the melting arctic releases all its methane and sets a horrible spiral into motion?

"I think, you know, it's—I think everybody can try to do whatever they can to improve. We do it on the operational part. It's sort of up to the individual to improve on the private part of it."

Again we arrive at the individual with his awesome power to refuse cheap oil and willingly pay more simply by checking the box that says *Would prefer to save the world.*

Does he really think the problems will be solved?

"Yes, I think so."

"Really?"

"Yeah. I think so."

"Why?"

"Because we don't have an alternative. Do we?"

Bacher was sweetness and light compared with Alison Redford, premier of the province of Alberta. Although her background is in international law, she's already had to juggle the fights over Keystone XL, Northern Gateway, and the EU's Fuel Quality Directive about dirty oil, and she's painfully aware of prime minister Stephen Harper's recent action to kill the National Round Table on the Environment and the Economy. "I don't think that we should be raising our carbon tax to a point that would make our products uncompetitive," she says.

At least Alberta has a carbon tax, she adds. "I'm not quite sure how I would articulate the policies in the United States with respect to energy and environment. I think we have to call a spade a spade.

"I mean, you're not going to hear me debating global warming," she says. "But there are also emissions from refining. There are emissions from people who are using the energy coming out of tailpipes. The challenge for us and for others, and even for consumers in the United States, is how do we start to get the whole thing under control?"

That's two mentions of consumers in the United States without breaking to draw a breath.

"How much do you want to pay for electricity?" she says. "How much do you want to pay for a hybrid car? If consumers say 'We want renewables and we want them fast,' then government and industry can leap into action. But I don't see consumers out there saying, 'Boy, I'm really concerned about greenhouse gases, so I want to pay eight dollars a gallon for gas.'"

But wouldn't that be the job of the political leaders? Shouldn't they consult with the scientists and the technocrats and tell us that we need to pay the price to save the planet?

A scornful smile crosses her face. "Quite frankly, it's going to be really interesting to watch your election because I'd be very surprised to see political leadership anywhere say, 'Okay, five dollars a gallon is just fine.'"

Keystone

So it's all up to the individual consumer? The average Joe choosing a gas station on the way to work is supposed to pass meaningful judgment on the full range of issues associated with extracting and processing tar sands? The sophisticated leaders of a sophisticated country like Canada can do nothing but stand by helplessly and wait for his verdict? Or is it even worse than that? Are they, as centrist Canadian environmental organizations like the Pembina Institute charge, simply bragging about their carbon tax and tough environmental laws and "ethical oil" while quietly gutting them with exemptions and exceptions?

In a few minutes, Redford is giving a speech to six hundred oil executives at their annual awards show for environmental achievement. Her assistant gives her a nod.

"You know what we'll do, John?" she finishes. "We'll take responsibility for our part. We can certainly take responsibility for the production and the extraction. But we can't take responsibility for how people in the United States or anywhere else choose to drive."

At the dinner, she's much friendlier to the oil executives. "We are gathered here to pay tribute to some basic simple truths that are overlooked by critics," she begins. "It's not all about the bottom line, and never has been. You recognize the need for transparency, honesty, verifiable social responsibility, and comprehensive standards." More to the point, she promises them a centralized, streamlined permitting process that will avoid the expensive delays caused by regulations and hearing processes.

First prize goes to the "scat dogs" trained to sniff out caribou excrement—the better to document their decline.

Now plunge down that pipeline route through South Dakota and Nebraska to Oklahoma and finally to Houston. There is opposition along the route and lots of fuss in Washington, but pipelines and pipeline opposition and fuss in Washington are all routine. The real issue is what comes out the other end.

The last section of highway 287 ramps you onto the west side, where empty storefronts and abandoned buildings feel like a ghost town. Trim little houses that look stubborn and sad survive, empty lots like graves between them.

At the end of the road stands a vast refinery, owned by Valero, now the country's largest oil-refining company. A spokesman named Bill gives a tour, dutifully pointing out all the environmental improvements: After the EPA put out regulations on tailpipe emissions, they built a gasoline hydrotreater that cost about $150 million, then the EPA got tough on diesel emissions, so they had to build another one. There's the low-NOx burners that are so much better than the bad old days, when the smokestacks fumed for hours. But now they have a special blend for Atlanta, for Chicago, and Houston and a dozen cities, which is the kind of thing that drives up the cost of gas. "The cleaner you want it, the more it costs."

But he saves his love for the crude unit. That's where the real refining gets done. The crude goes into this big box called a crude heater, which has huge burners just like on a stove, only four or five feet wide. They heat the oil to around 1000 degrees. Next, it goes to cool off in a fractionating tower—since all oil-based products have different boiling points, they separate at different points in the cooling into naphtha, jet fuel, diesel, home heating oil, ethylene gas, which is used to make plastic. And that's how you refine oil.

The residuum they send to the coker. That's the heaviest material, the leftover. Tar, basically. A coker takes carbon out. Some refineries don't even have a coker. They use the lighter crudes and use their residuum to make asphalt. Valero has a very large coker. Built in 2000, it's one of the largest cokers in the U.S. and one of the largest cokers in the world. This gives them the ability to process eighty thousand barrels a day of sour heavy crude and makes them the most profitable refinery in the Valero system, which is why Keystone XL is so important. They've been feeding it heavy crude from Venezuela, but that's starting to run low.

This is the crazy part, a small group of Valero executives tells you shortly afterward in a conference room in their boxy utilitarian offices next to the front gate. There's no such thing as dirty oil. There's heavy oil, there's sour oil, there's light-and-sweet crude, but they all have emissions when you start refining them. With heavy oil you have to do more processing, that's all. And that's what refineries like this are set up to do. They've been doing it for decades. Nothing is going to change. They'll stay within their emissions standards. There's nothing new except having to expand production a bit. "So we look at a stable, reliable supply that we have with a trading partner we value very highly, and they're gonna produce the oil anyway…."

"And it's gonna get refined somewhere…."

"We're gonna run it or they're gonna send it to China…."

"And their refineries won't be as clean as what we're buildin' here…."

The cost of gas is a side issue dreamed up by Washington. There is a temporary glut in the Midwest, but that's a ridiculous situation—there's crude being run on trains. It won't last.

The national-security issue is bogus, too. "All crudes today get bought on world markets period," says an amiable executive named Greg Gentry.

Democrats have maintained that Valero will sell much of the refined Canadian oil to China. But Gentry explains. Valero doesn't drill for its own oil. Every single day, they're out there trying to buy two and a half million barrels of the stuff. When they built their new coker back in 2000, for example, they did a deal with the Mexican government to buy Maya crude. Without the heavy crude, they got nothing to put in the coker. But Maya's dropped off huge and Venezuela is declining

too, which affects their ratable sales. And ratable sales are all about predictability. So Valero has to buy and sell 2.5 million barrels a day to whoever's buying—i.e., the Chinese.

It's all about the churn. Keeping the system moving. That leaves global warming. In California, they passed a regulation called AB 32 that calls for a reduction in greenhouse-gas emissions to 1990 levels. Valero has refineries in California, so they looked very closely at this issue. "The fact is, if global warming is a global problem, you can't do anything to solve it on a state-by-state level," Gentry says.

That's why Valero became so vocal against the California regulation. Same thing with cap-and-trade—in Valero's view, the benefit just did not offset the cost. "If you look at all the CO_2 emissions that are in the world," he says, "transportation fuels are an extremely small percentage."

And who knows? There's research that suggests this could be just a natural warming cycle.

That's why he believes that in the end, the whole question comes down to individual freedom and individual responsibility. "If you as an individual truly wanna make an effect, then quit driving. And turn your air conditioner off in the summertime."

There are malcontents and gadflies here, too. Behind the wheel of his big black SUV, the only car that fits and befits a man so big and black, Hilton Kelley shows the other side of the story. "This is downtown. Back in '84, '85, this place was somewhat still alive. J.C. Penney's was over here, there was Kress, there were shoe stores and laundromats and banks."

Now it's just one abandoned building after another, with a handful of government buildings in between.

Turning his car left, he crosses a dusty set of railroad tracks and suddenly there's nothing but fields and the traces of old building foundations. This is the black ghetto, he says. "Back in the sixties and seventies, there were a row of nightclubs here. There was a cab stand, a little hotel two stories high. This here was the seamen's union hall."

Gone back to nature, every one.

"As a matter of fact," he says, "I saw a coyote not long ago running right here down Howard Street. And there's falcons that sit up on the poles here—you see little rabbits that run across the street, the falcons are scoopin' 'em off."

Kelley was born here fifty-two years ago, delivered by a midwife in a housing project butt up against the fence of one of the biggest oil refineries. In the last ten years, he's fought to keep local companies from bringing in twenty thousand tons of PCBs from Mexico to incinerate and fought for compensation after a toxic release so bad, the hospital stopped taking people and they evacuated everybody to an auditorium on the east end of town. He fought when Motiva expanded from 285,000 barrels a day to 600,000—the damn thing stretches for almost two miles now. He fought when they brought VX nerve gas wastewater and said, "You can bathe in it, it's nothing more than caustic water." But when they try to get class-action lawsuits going, the refineries send lawyers to offer $1,000 if they'll just sign off on this release. They won't even put in a siren alarm because they say it will alarm people.

For all of this, he won the Goldman Environmental Prize in 2011, which got him a visit to the White House and a personal photo with Barack Obama. The odd thing is that his neighborhood is just an isolated pocket of misery—only a few miles away in the white neighborhoods on the east side of town, the fence-line communities next to the refinery are nice suburban neighborhoods. Kelley's distress goes much deeper than the environment. "The difference is that historically they have always communicated with the residents there," he explains. "Whereas in this community they just shunned us, and we had no idea what we were smelling—and we didn't agree to live here."

As he speaks, a flare *thwops* into the air from a tall cement tower.

Kelley seems a bit startled. "Now that's a—that's an emission incident."

A cloud of oil-black smoke materializes out of the edges of the flames like a magic trick.

"That is an emission incident," he repeats.

In the old days, he says, these would go on all night. They would rain down oily mist that would wet your clothes. As he talks, the black smoke expands into the shape of a big balloon and keeps expanding and rising.

"That's a toxic cloud. What's in it? Number one, carbon monoxide, benzene, 1,3-butadiene, you name it."

It's gone by the time you get out your camera.

Back in Washington, oil keeps winning. Obama announces his intention to expedite the southern leg of Keystone, which will relieve the glut in Oklahoma. "I've directed my administration to open up millions of acres for gas and oil exploration across twenty-three different states," he brags. "We are drilling all over the place right now! We've added enough new oil and gas pipeline to encircle the earth!"

The Democrats push a bill to eliminate a $2.5 billion taxpayer subsidy to oil companies. The American Petroleum Institute responds with a million-dollar ad campaign that warns of higher gas prices, calling the bill "another bad idea from Washington."

The Senate votes in favor of the oil companies.

In December, the EPA proposes rules requiring refineries to reduce sulfur emissions by two thirds. Sulfur can cause rashes and lung damage and aggravate asthma. The rule would add about a penny to the cost of a gallon of gas. Republicans fight to stop it, Obama puts the decision off.

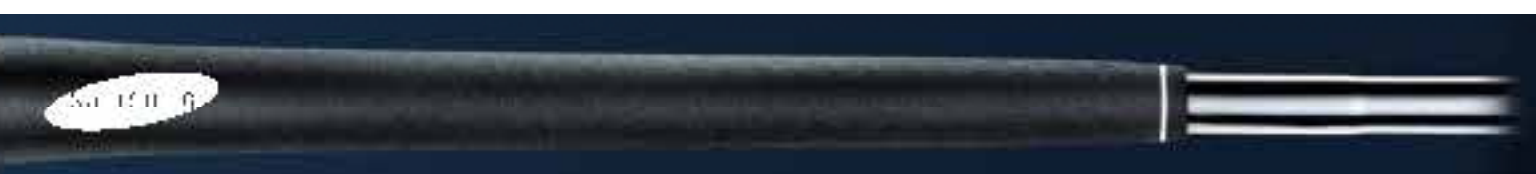
In Europe, the EU puts off its decision on the Fuel Quality Directive on dirty oil until sometime in 2013.

In Tennessee, the legislature passes a law requiring public schools to allow science teachers to explore "weaknesses" in global warming.

Theoretically, we're all responsible for this. Each of us makes the decision every day to drive and eat and wear synthetic jackets from REI. "Ultimately," as Nicolette Stanley said, "I'm responsible for my own behavior." But does this make any sense in reality? For example, the individualistic polluter-pays principle says that oil companies just pay for the CO_2 they produce. So they pay 20 percent and the consumer figures out some way to pay for his 80 percent. Except neither really pays because there is no way for the individual consumer to control the carbon from his private car or to stop driving to work, and if he dares to elect politicians who support tough regulations, the oil companies retaliate through powerful collective associations like the American Petroleum Institute and the U. S. Chamber of Commerce to fight off any and all carbon taxes and gas taxes and public-transit taxes. In the last year alone, oil and gas companies contributed $38 million to (overwhelmingly Republican) politicians and deployed 622 lobbyists. Repeated over and over by people with a financial interest in believing it, the glory of individual choice turns democracy into a cheap confidence scheme—have it your way, the rallying cry of a nation that learned its politics from advertisements.

So we're left with the cranks and the malcontents, the Lepines and the Kelleys. Eccentric and marginal though they may sometimes seem, heartsick as they often are, without their pressure the regulators go right to sleep.

The leader of this last remaining opposition is Bill McKibben, standing on this chilly overcast day at a small podium in a field just below the Capitol Building in Washington. A skinny, geeky-looking guy, a writer and a college professor and a Sunday-school teacher who looks exactly like those things, an R. Crumb character as earnest public citizen, he has organized some of the largest public protests in human history out of his college classroom and a Web site called 350.org, including the big pipeline protests outside the White House last summer, where James Hansen and a thousand other people were arrested and also the one where ten thousand people surrounded the White House with an inflatable pipeline. Today he's wearing a referee's black-and-white-striped shirt. "Thanks for being here," he tells his group. "Thanks for



getting arrested back in August."

People cheer. Drummers drum. Most of them are wearing referee T-shirts, too. The youngest is a crusty from Occupy D. C. who didn't want to give his name. Mark Felton is in the middle, a fifty-eight-year-old salesman who heard about the protest in church. The oldest is probably Tom Bale, a seventy-year-old social worker from Philadelphia who diligently follows McKibben's Web site. "He's thin, he doesn't have much hair, sometimes he coughs, but man, he keeps plugging away."

McKibben blows a whistle. "Now we have to go on offense," he says.

The problem is oil money, he says. The pipeline will bring the heaviest, dirtiest kind of crude to the United States. Famed climate scientist James Hansen said that using it all would be "game over" for the planet. But the oil money is warping our political process in the worst possible ways. The members of the House who voted to speed up that Keystone approval process took $42 million from the fossil-fuel industry. Congress gave back $320 in subsidies for every dollar they took. Subsidies! To the largest and most powerful companies on earth, companies larger than governments. "That's not right! It's just not right. We've gotten used to the idea that this is how things work in Washington, but it is not right that that is how they work."

So, the shirts. He's a Patriots fan, and wouldn't everyone would be outraged if the Patriots had been paying off the referees? It would be a national scandal. But the exact same thing happens in Congress every day. The crowd boos, and McKibben says, "It's wrong and stupid and not gonna happen unchallenged anymore."

The crowd cheers, the whistles blow, and McKibben introduces a series of fiery but fringy guest speakers—an Indian woman who lives near a pipeline and America's only socialist senator, Bernie Sanders. There's a lot of talk about creating jobs with sustainable energy. In between, McKibben keeps them pumped—this isn't academic, there's unbelievable flooding in Thailand, the Maldives are sinking, India and Bangladesh are vulnerable, hurricanes on the increase, hundreds of thousands of people dying right now. The tar sands have to be stopped.

When it's over, McKibben throws his penalty flag. Everyone else throws their penalty flags. "All across America people can throw that flag, not for pass interference but for interference with our democracy."

If this sounds corny and small-time, that's what it is. But the cameras record it, a couple of news cameras and dozens of small ones that will be uploaded to Facebook and other Web sites. It's not much, but they have to do something. Maybe the world will catch on before it's too late.

And off they go, malcontents all, blowing their whistles.