

# Focus

## OIL, GAS & ENERGY

pages 10-16

# Oil from SAND

**By Andrew Haley**

*The Enterprise*

U.S. Oil Sands Inc. has moved closer to breaking ground on an ambitious project to extract oil from bitumen deposits in eastern Utah.

With a favorable decision in late August from Administrative Law Judge Sandra Allen, U.S. Oil Sands overcame a significant permitting obstacle to its proposed operations. Allen, appointed by the Division of Water Quality (DWQ), decided against two environmental groups, Living Rivers and Western Resource Advocates, which argued that U.S. Oil Sands' proposed Uintah County mine would contaminate groundwater.

"U.S. Oil Sands [is] not going to discharge [contaminants] into groundwater because the nearest ground water is 1,500 feet underground," said U.S. Oil Sands' lawyer, A. John Davis III.

"I think the administrative law judge's position was well taken and we certainly agree with it," he said.

With the ruling, Davis, who is a partner in the Salt Lake office of Holland and Hart, said U.S. Oil Sands will face a final hearing before the DWQ "followed by what I think will be a very brief hearing before the Division of Oil, Gas and Mining."

U.S. Oil Sands, a Calgary-based company, holds bitumen leases for over 32,000 acres of public land in Utah through a wholly owned U.S. subsidiary. According to the company, Utah possesses more than 50 percent of U.S. stocks of bitumen, also known as tar sands and oil sands. The company intends to develop its bitumen properties using a patented extraction process that utilizes a biodegradable, citrus-based

solvent to wash oil from the sands in which it is found.

The words "tar sands," particularly when conjoined with "Canada," are a war cry for environmentalists, who point to ongoing, large-scale bitumen strip mining operations in Alberta as one of the most allegedly egregious examples of corporate greed and environmental degradation in recent memory. But U.S. Oil Sands' proposed Utah operation is vastly distinct in both technique and scale from the tar sands mining under way in Canada, said Barclay Cuthbert, the company's vice president of operations.

Cuthbert said the traditional tar sands mining ongoing in Canada differs in almost every way to the operation that U.S. Oil Sands is proposing in Utah. Most of the bitumen deposits being mined in Alberta are so far underground that they can be efficiently developed only by stripping away hundreds of feet of overburden, resulting in large open-pit mines, he said. Canadian tar sands mining employs variants of the Clark Hot Water Process, patented in 1926, which uses very hot water and mechanical mixing to separate the oil from the tar sands, he said.

One chief complaint of environmental groups is that Canadian tar sands oil production is highly inefficient, since vast amounts of oil are required to power the machinery that removes overburden and heats and mixes the slurry during separation. In addition to a large carbon footprint, Alberta tar sands mining is also allegedly to blame for contaminating tracts of Canadian wilderness with a hazardous byproduct of

*see SANDS page 12*



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# Industry giants pumping \$1 billion in capital investments into increasing production of low-cost Uinta Basin oil

By Andrew Haley  
The Enterprise

Several national oil giants are pumping \$1 billion in capital investments into the state in an effort to increase production of a high-value, low-cost type of oil found in abundance in the Uinta Basin. The oil, black wax crude, is just that — black and, at room temperature, the consistency of candle wax. Unlike sweet light crude, which is of lighter color and much thinner consistency, black wax crude cannot be transported via pipeline, but must be shipped in specialized heated tanker trucks to refineries that possess the adequate machinery to break it down into gasoline and other commodities.

On both the supply and refining ends, black wax crude poses unique challenges to companies seeking to bring it to market. Drilling companies operating in the Uinta Basin must invest in the specialized trucks needed to transport the crude, which must be delivered to refineries relatively close by. The limits of existing transportation infrastructure and the geographic isolation of the Uinta Basin leave supply companies with no practical refining alternative than to deliver black wax crude to Salt Lake's refineries, which currently are unable to refine black wax crude in meaningful volumes.

On the refining end, Tesoro, HollyFrontier and Chevron, which operate three of the oil refineries along the I-15 corridor in Salt Lake City and Woods Cross, are in various stages of nearly \$500 million worth of capital investment projects to increase black wax crude refining capacity at those refineries. Tesoro received an approval order from the state Department of Environmental Quality (DEQ) on Sept 13, meaning DEQ had reviewed and given the green light to the company's proposed \$180 million upgrade and expansion. HollyFrontier is still in the initial stages of the permitting process of its \$225 million capital project, according to vice president and Woods Cross refinery manager Lynn Keddington.

"What we're proposing to do is increase [refining capacity for] black wax and potentially yellow wax crudes from the Uinta Basin, and eventually double the refining capacity," Keddington said. "It's still under the permitting process. They came back with a series of questions. I would anticipate in the next month it would go to public comment."

He said he anticipated HollyFrontier would receive DEQ's permission to proceed "sometime after the first of the year, in January or February."

Greg Hardy, a spokesperson for Chevron, said Chevron is committed to \$83 million in capital investments aimed at modernizing older equipment and meeting more stringent structural requirements. Unlike HollyFrontier and Tesoro, Chevron's upgrade is not specifically tied to increasing production capacity for waxy crudes, Hardy said. Nor is its refinery upgrade under the same urgency as Tesoro and HollyFrontier's expansions, which have both already made significant headway in the DEQ permitting process.

Stacey Adams, an environmental planning consultant for DEQ's office of planning and public affairs, said Chevron is

not currently in any stage of the permitting process.

Concurrent capital investment at the three refineries has been reported as though the three projects are part of the same trend, when in fact the Tesoro and HollyFrontier projects are transformational while Chevron's is merely an upgrade. Both HollyFrontier and Tesoro are more than doubling their refining capacity for black wax crude, while Chevron's investment will not change the refinery's black wax crude production capacity.

"Ours is not an expansion. It is an upgrade. We will not be expanding our capacity," Hardy said.

According to Hardy, the upgrade will focus on installing new pumps and piping, a desalter, columns, and heat exchanges near where crude enters the refinery. Hardy said the Chevron refinery currently possesses the

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The HollyFrontier refinery in Woods Cross will begin increasing its capacity for black wax crude sometime after the first of the year.



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## SANDS

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the separation process. Potential groundwater contamination was the central argument of Living Rivers' and Western Resource Advocates' complaint.

"The problem [with traditional oil sands mining] is the mixing of the hot water and sand is very vigorous. It creates a sludge, composed of very fine solids, oil and water, that sits in tailing ponds," Cuthbert said. "The tailing ponds get to be enormous. The old mines sit. Instead of recovering them, they turn them into tailing ponds, so you create these lakes with oil in them. If wildlife get in that, they'll die. Environmentally it is very challenging. And lots of water gets tied up in that because it has to be at a very large scale to be successful. Exxon's oil sands project produces 100,000 barrels per day. It is Exxon's largest project anywhere. Oil sands development in Canada is the largest industrial development in the world.

"We've got a brand new technology. Instead of mixing hot water vigorously, we mix a solvent and not so hot water and mix it gently. Because the process has small mechanical mixing, you don't get a sludge, so there's no tailing pond. Our byproducts are clean water, clean sand and clean oil. We don't require much water, because we reuse it as we go. It uses much less energy and you get clean products."

U.S. Oil Sands' initial development proposal is for a 213-acre site called the P.R. Spring mine. The bitumen deposits at P.R. Spring consist of oily sands that lie on the surface and reach depths of 150 feet. The site lies in the arid uplands of the Book Cliffs, east of the Green River, between I-70 and U.S. 40, about 10 miles from the Colorado border.

In a nutshell, U.S. Oil Sands will dig up the oily sand, wash the oil out of it, and put the sand back where it came from, Cuthbert said. Both the water and the biodegradable, orange-peel-based solvent will be brought to the site, reused on site, and removed on completion, he said. Cuthbert said it would take three years to return the site to its pre-mining condition, compared to 50 years for reclaiming Alberta tar sands mines.

"We reclaim as we go. At any one time, we'll probably only have 30 or 40 acres open. The operation is very straightforward. The extraction is very straightforward. The solvent is a bio-solvent. It comes from citrus. It's biodegradable. We recycle all our solvent, but if there's any trace left over, it's biodegradable," Cuthbert said.

Even if it weren't, the potential for contaminating area groundwater at the P.R. Spring mine site is nonexistent, Davis said; the only groundwater in the area lies more than 1,500 feet underground, beneath an impervious rock layer. Davis said Living Rivers and Western Resource Advocates had changed their reasoning multiple times over the course of the year-long hearing, ultimately arguing that damp sands would mobilize residual oil and contaminate aquifers, which he said was not only impossible but disingenuous, since oil is already present at the site, and if anything U.S. Oil Sands was making the site cleaner.

"My view is that it has become the poster child for all the alternative fuels. It's become this cause célèbre. What they're comparing it to is nasty — using tons of water, strip mining. It's nasty, and if that was going to be what happened in Northeast

Utah it would be a disaster, but that's not what's going to happen," Davis said.

Cuthbert said he thought environmental opposition to the P.R. Spring mine was motivated less by the specific allegations made in the hearing than by an anti-oil agenda using the permitting process to delay and run up the costs of development.

"Environmental groups are against all oil. The better it is, the more they hate it. [People who say,] 'I don't want to develop it, but I do want to fill up my car' just made a choice to import it from Venezuela," Cuthbert said.

"People have a hard time imagining that an oil sands project won't just get bigger and bigger, but it won't. We have the smallest surface footprint, the smallest water footprint, and the smallest greenhouse gas footprint of any oil program. There is higher quality oil in Utah than in Canada. Most global heavy oil is high in sulfur, which means costly sulfur refining. If you don't have the sulfur [like in Utah] you save on costs and greenhouse gas. All in all, from the environmental side, there are a lot of benefits to Utah oil in Utah refineries."

If U.S. Oil Sands can overcome environmental opposition, the company stands

to make a fortune. According to a 2007 paper by J. Wallace Gwynn of the Utah Geological Survey, "Utah's measured tar sand resource, though small in comparison to that of Canada, is the largest in the United States."

"Utah's tar sand deposits contain 14 to 15 billion barrels of measured oil in place, with an additional estimated resource of 23 to 28 billion barrels," the article states.

According to the U.S. Energy Information Administration, the United States had 25.2 billion barrels of proved reserves as of 2010. With as much oil in its bitumen deposits as the entire U.S. proved oil reserves, Utah could become one of the largest oil-producing states in the country, if companies like U.S. Oil Sands can figure out an economical solution to tar sands development. According to the Utah Division of Oil, Gas and Mining, Utah is currently ranked 11th in the country in crude oil production.

"This is a highly economic project. It's very economic at a small scale. You can spend a lot less money to do it [than in Alberta], and then it generates a lot of revenue, including for the royalty owner, [with] \$2 million per year going into royalties,"

Cuthbert said.

According to Davis, the royalty owner of the P.R. Spring mine is the state of Utah's education fund.

"Utah's oil sands are large, quite a bit larger than the country's conventional reserves — 30 billion barrels," he said. "Unlike in Alberta, where over 80 percent is deeper than 300 feet, in Utah it's mostly shallow. You can get at it from the side of a hill. That's how they are up at P.R. Spring. If you can only get 10 percent out, that's 3 billion barrels. If you get \$100 a barrel, that's \$300 billion. We're not dreaming that big yet. We're talking about 2,000 barrels per day.

"So far we've invested about \$25 million in leases, tests, development. We expect to invest an additional \$30 million more in local construction, storage tanks, and surface structures mostly built in the Salt Lake area, so that \$30 million will be driven into the local economy," Cuthbert said.

Cuthbert said the P.R. Spring mine would employ 25 full-time workers, with an additional "100 or more" hired during the

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## Coal plentiful in Utah, but other factors could hike electricity rates

By Brice Wallace

*The Enterprise*

Utah has about 100 years of coal reserves but factors affecting that industry could result in higher electricity rates for Utahns, according to speakers at a recent Public Utilities and Technology Interim Committee meeting.

Among those factors are power generation companies switching to natural gas or renewable resources and stricter environmental regulations, speakers said. For example, the Intermountain Power Agency's Intermountain Power Project (IPP) near Delta currently has coal-fired generators, but one of its main customers, the city of Los Angeles, could pressure the agency to move away from coal and toward natural gas. IPP uses one-fourth of the coal mined in Utah.

Mark Compton, president of the Utah Mining Association, said there are no moves afoot for IPP to switch to natural gas but the potential is there for it and other generators to do so. He said the industry believes it is important to start a discussion of the matter with legislators in order to keep the industry producing "despite all the outside pressures."

*Last year, nearly 20 million tons of coal was mined in Utah, with a market value of \$600 million. The industry had 1,748 direct employees with total wages of \$132 million and total compensation of \$155 million, or about \$90,000 per worker.*

"These outside forces from L.A. are potentially affecting a significant portion of Utah's coal industry," Compton said. "But given these significant, wide-ranging contributions of the coal industry to Utah's economy, it therefore is important that you consider the potential ramifications of a conversion to natural gas to the state of Utah's tax base, jobs, royalties coming to the state, as well as the potential higher cost of electricity to Utah customers."

Eighty-two percent of electricity generation in Utah comes from coal and Utah is tied with Idaho for the second-cheapest power rates in the country, trailing only Wyoming. Currently, the relative stability of coal prices helps keep Utah's power rates low, and that contributes to the state's reputation as being a site with a low cost of doing business, Compton said.

"Keep in mind that one of Utah's advantages to attracting businesses, manufacturing jobs and even technology jobs is our low cost of electricity. Cheap power lowers business costs and makes Utah more competitive. Therefore, beyond the immediate economic and fiscal ramifications of moving away from coal, we also must keep in mind the need to remain competitive on energy prices," he said.

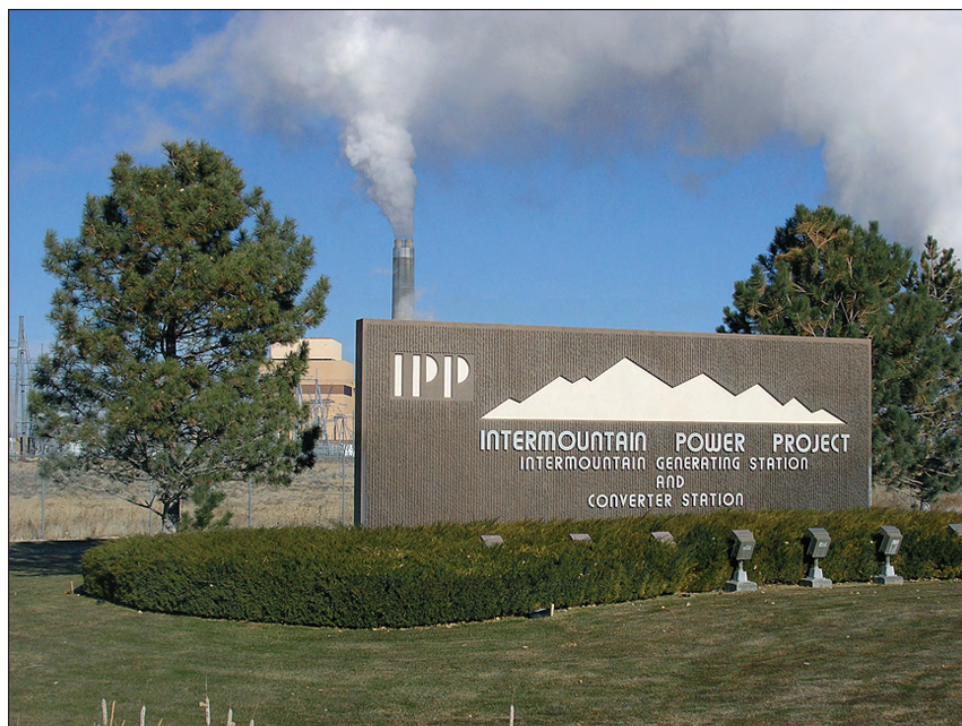
Compton stressed that he was not attacking the Intermountain Power Agency, natural gas or renewable energy sources, but Utah needs to "maintain our energy advantages and competitiveness and at the same time maintain an industry as important to our state as the coal industry."

Last year, nearly 20 million tons of

coal was mined in Utah, with a market value of \$600 million. The industry had 1,748 direct employees with total wages of \$132 million and total compensation of \$155 million, or about \$90,000 per worker. It also accounted for 4,700 jobs indirectly, \$22 million in tax revenue royalties in state and federal lands (federal royalties are split with the state) and \$4 million in local tax revenues.

"I live in Sanpete County," said Wes Sorensen, general manager of Arch Coal Inc.'s Skyline Mine. "There are very few high-paying jobs in Sanpete other than jobs associated with mining, and the same is true in Sevier County" and Carbon and Emery counties. If Utah produced 1 million fewer tons a year, it would result in 100 lost jobs "from places where there are not that many good jobs," he said.

Sen. Ralph Okerlund, R-Monroe, said that miners spending their earnings at local businesses results in an Arch Coal mine affecting 40 percent of the Sevier County economy.



*The IPP plant in Delta currently utilizes coal, but one of its largest clients, the city of Los Angeles, could press for a shift toward natural gas.*



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## REFINERIES

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means to refine black wax crude and refines some that is delivered by truck from eastern Utah. He declined to elaborate on what percentage of Chevron's refining volume consists of black wax crude.

With their substantially larger capital investments, Tesoro and HollyFrontier are betting big on the future of Uinta Basin black wax crude. Both companies recently agreed to multi-year supply agreements with Newfield Exploration for a combined 38,000 barrels per day (bpd) of Uinta Basin black wax crude. Newfield, which has doubled its in-state extraction volume in the last few years, signed a 10-year, 20,000 bpd supply agreement with HollyFrontier in January 2012, and a seven-year, 18,000 bpd supply agreement with Tesoro in December 2011.

In April, the Associated Press reported that Newfield plans on investing \$500 million, a full third of its 2012 operating budget, in its Uinta Basin drilling operations.

*Tesoro and HollyFrontier are betting big on the future of Uinta Basin black wax crude. Both companies recently agreed to multi-year supply agreements with Newfield Exploration for a combined 38,000 barrels per day of Uinta Basin black wax crude.*

The Uinta Basin is in the midst of an oil boom, and no company has been as successful as Newfield. According to figures from the Utah Division of Oil, Gas and Mining (DOG M), Newfield produced more crude oil in Utah in 2011 than the top four producers, Exxon, Inland, Texaco, and Mobil, produced in Utah in 2001 together.

According to DOGM's figures, Newfield produced 7,717,767 barrels in Utah last year, up from 7,317,226 barrels in 2010, 5,861,970 in 2009, and more than double the 3,401,371 barrels it produced in 2005, its first full year operating in the state. In 2004, Newfield purchased its Monument Butte oil field in Duchesne and

Uintah counties from Inland Resources for \$575 million. Since then, Newfield has led a vanguard of innovative, new oil exploration and production companies that have used cutting edge technologies and business acumen to unseat the stalwarts of the Utah oil industry and bring about the ongoing oil boom.

A decade ago, the top 10 oil producers in the state included such household names as Exxon, Chevron, BP and Texaco. In Utah, in 2002, Chevron produced 825,802 barrels, BP 632,706 barrels, and Texaco 631,532 barrels of crude. In the first five months of 2012, Newfield produced 3,473,871 barrels, with over 2,277,940 barrels, more than the

2002 Utah production volume of Chevron, Texaco and BP combined, coming from its Monument Butte field alone.

Newfield plans on drilling 180 new wells in its Monument Butte field this year, bringing the total number to 1,980 in the area. Though it is still committed to Monument Butte, the company is beginning to shift its operations north into the Central Basin area, where it acquired 70,000 acres in 2011. Thirty existing wells in the Central Basin have proven successful and Newfield plans on building 60 more there, with four of the company's seven operated rigs drilling in the Central Basin.

According to DOGM officials, the vast majority of the oil in the area where Newfield operates is either black wax or yellow wax crude. Like black wax crude, yellow wax crude is high in paraffin and requires specialized supply and refining solutions, though, like black wax crude, its component commodities are ultimately of higher quality than those derived from sweet light crude. With production booming, Newfield's bonanza is held in check only by the unique transportation and refining challenges of waxy crudes.

Meeting those challenges will ultimately prove profitable, according to Keddington. Because it is so difficult to transport and refine, black wax crude sells for less than sweet light crude, though the products refined from it sell at a premium. That means that for HollyFrontier and Tesoro, their 20,000 bpd and 18,000 bpd supply agreements, which go into effect in 2014 and 2013, respectively, guarantee a steady and abundant supply of a lower cost raw material it will ultimately manufacture into higher price goods.

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construction phase. The mine would operate year-round. Workers at the mine would live in a mining camp operated by a camp outfit from Grand Junction, Colo., with food supplied from there and Vernal.

"Most of our operators will live in the camp. They'll work for a week then go home for a week. Most of the skills we're looking for are available locally. Vernal and Moab would be easy for people to work from. A significant part of this is service and support. If you have 40 guys living in a camp, you need to hire someone to feed them. [There are] mechanics and yearly overhauls. In any given year we expect to spend \$20 million in support and service, and much of that is local," Cuthbert said.

U.S. Oil Sands expects to break ground next spring. After the spring runoff, large tanks and other infrastructure manufactured in Salt Lake would be transported to the remote site on skids. Though two hearings remain before its permit is officially approved by state agencies, Cuthbert said he expects to ultimately win an approval process that started in 2005.

"The \$25 million we invested [is] because we are confident this will be approved. This recent win is one of many. We expect to be active out there in the spring. I have quiet confidence we'll continue to meet expectations and show people a better way to do stuff," Cuthbert said.

"We're always telling people, if you guys have a better solution, please let us know."



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## Study: every \$1 invested in energy efficiency yields more than \$2 in savings

Utility programs that save energy could create an economic windfall of \$20 billion for six southwestern states, including Utah, according to a new study.

The study, "The \$20 Billion Bonanza: Best Practice Utility Energy Efficiency Programs and Their Benefits for the Southwest," was released earlier this month by the Southwest Energy Efficiency Project (SWEET), based in Colorado. The report shows that every dollar invested in energy efficiency programs returns more than two dollars in savings on business and household utility bills.

"By scaling up energy efficiency programs, utilities in the region can avoid spending tens of billions of dollars constructing and operating power plants," said Howard Geller, executive director of SWEET and principal author of the report. "Helping households and businesses save energy is the lowest cost, cleanest and least risky resource available to utilities today."

According to the report, Utah should continue its progress in expanding energy efficiency programs by:

- Adopting energy savings goals. Utah's Public Service Commission (PSC) should act on a 2009 legislative resolution and adopt energy savings goals for PacifiCorp, the state's largest investor-owned utility, that increase over time.

- Removing disincentives. The

PSC should separate electricity sales from utility fixed-cost recovery for PacifiCorp, just as it did for Questar Gas Co.

- Rewarding performance. The PSC should establish performance-based incentives that enable utility shareholders to earn a reasonable profit when the utility implements effective energy efficiency programs for its customers.

- Maximizing participation in electricity savings. Utah's utilities and PSC should fully fund all cost-effective energy programs.

- Involving all utilities. All utilities in Utah should provide robust energy efficiency programs to their customers.

Benefits cited if utilities were to implement best practice efficiency programs in Utah, according to the report, include:

- Saving households and businesses \$1.7 billion net.

- Saving 3.2 billion gallons of water by 2020.

- Creating 3,100 Utah jobs.

- Fewer air emissions, resulting in improved public health.

- Saving enough electricity to power 590,000 homes.

- Reducing CO<sub>2</sub> emissions by an amount equal to removing 470,000 cars from the road.

- Avoiding or closing three power plants.

### The Bottom Line: Households and businesses in Utah can save \$1.7 billion through greater commitment to energy efficiency.

Energy efficiency is the lowest-cost, cleanest, and least risky resource available to electric utilities in Utah. By implementing best practice energy efficiency programs, electric utilities in Utah would:

- Save their customers \$1.7 billion net
- Cut electricity use in 2020 by 20% and peak demand by 18%
- Avoid 3 large power plants
- Save 6.2 billion kilowatt hours per year by 2020, equivalent to the electricity use of 590,000 typical households
- Support 3,100 new jobs and boost retail sales
- Cut air pollution and improve public health
- Reduce CO<sub>2</sub> emissions by 2.4 million metric tons per year by 2020, equivalent to taking 470,000 passenger vehicles off the road
- Reduce water consumption by 3.2 billion gallons per year by 2020

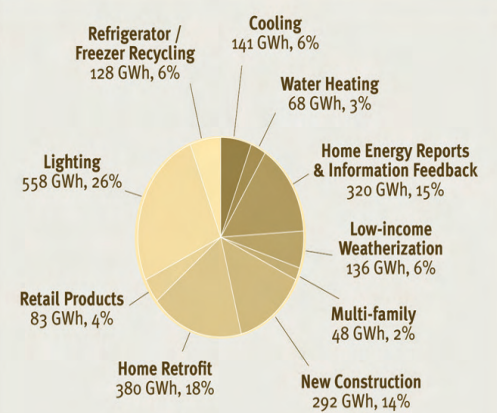
### We'll Get There by Employing Best Practices

To reap the benefits listed above, Utah utilities should ramp up their energy efficiency funding significantly during 2013-2020.

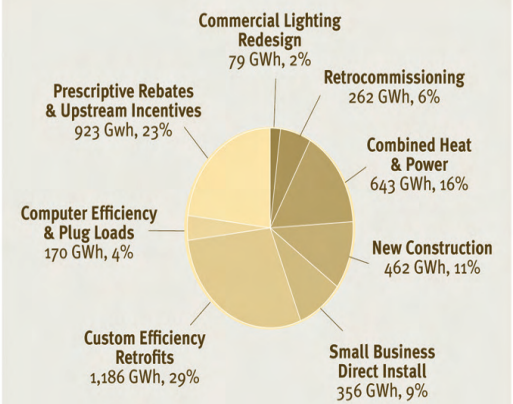
Best Practice utility energy efficiency programs include education, technical assistance and financial incentives for all customers.

Utilities should promote all cost-effective energy efficiency measures including energy-efficient lighting, appliances, air conditioning systems, electronic devices, control systems, building envelope retrofits and better performing new homes and commercial buildings.

### TOTAL RESIDENTIAL ELECTRICITY SAVINGS IN 2020 BY PROGRAM (GWh)



### TOTAL COMMERCIAL & INDUSTRIAL ELECTRICITY SAVINGS IN 2020 BY PROGRAM (GWh)



OUR ENERGY FUTURE IS GETTING BRIGHTER. JUST LIKE THE FUTURE OF OUR COMMUNITY.



It's no secret that Utah and the surrounding region continue to grow rapidly, just like our need for energy to fuel that growth. To meet that need, HollyFrontier, one of America's leading independent energy providers, is investing hundreds of millions of dollars in its Woods Cross Refinery.

This investment allows HollyFrontier to secure a strong energy future for Utah and the region in an environmentally responsible manner so that we can continue to prosper and maintain our daily lifestyles. It also creates good, high-paying jobs and is a boon to the state's economy.

HollyFrontier is proud that its Woods Cross Refinery has been part of the social fabric of Utah for more than 75 years. The Woods Cross Refinery is committed to being a good neighbor and contributing to the community's quality of life.

*HollyFrontier. Securing a strong energy future.*

  
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