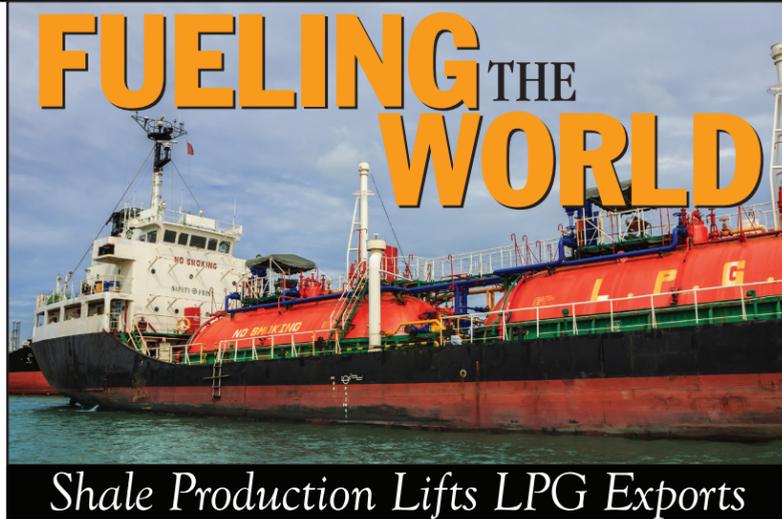


# FISCAL NOTES

A Review of the Texas Economy from the Office of Susan Combs, Texas Comptroller of Public Accounts

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BY LAUREN MULVERHILL

If you're a Texan, you're used to extreme weather. But are you up for a shale gale?

That's what some are calling the booming production of oil and natural gas from shale formations, driven by the use of hydraulic fracturing ("fracking"). And it shows no signs of slowing: by 2040, for instance, the U.S. Energy Information Administration (EIA) predicts that shale will account for more than half of all natural gas produced in America.

Texas, with major production in the Barnett and Eagle Ford shale formations and the Permian Basin, is ahead of the pack. In 2013, our state led all others, producing 29 percent of the nation's marketed natural gas and 34 percent of its oil.

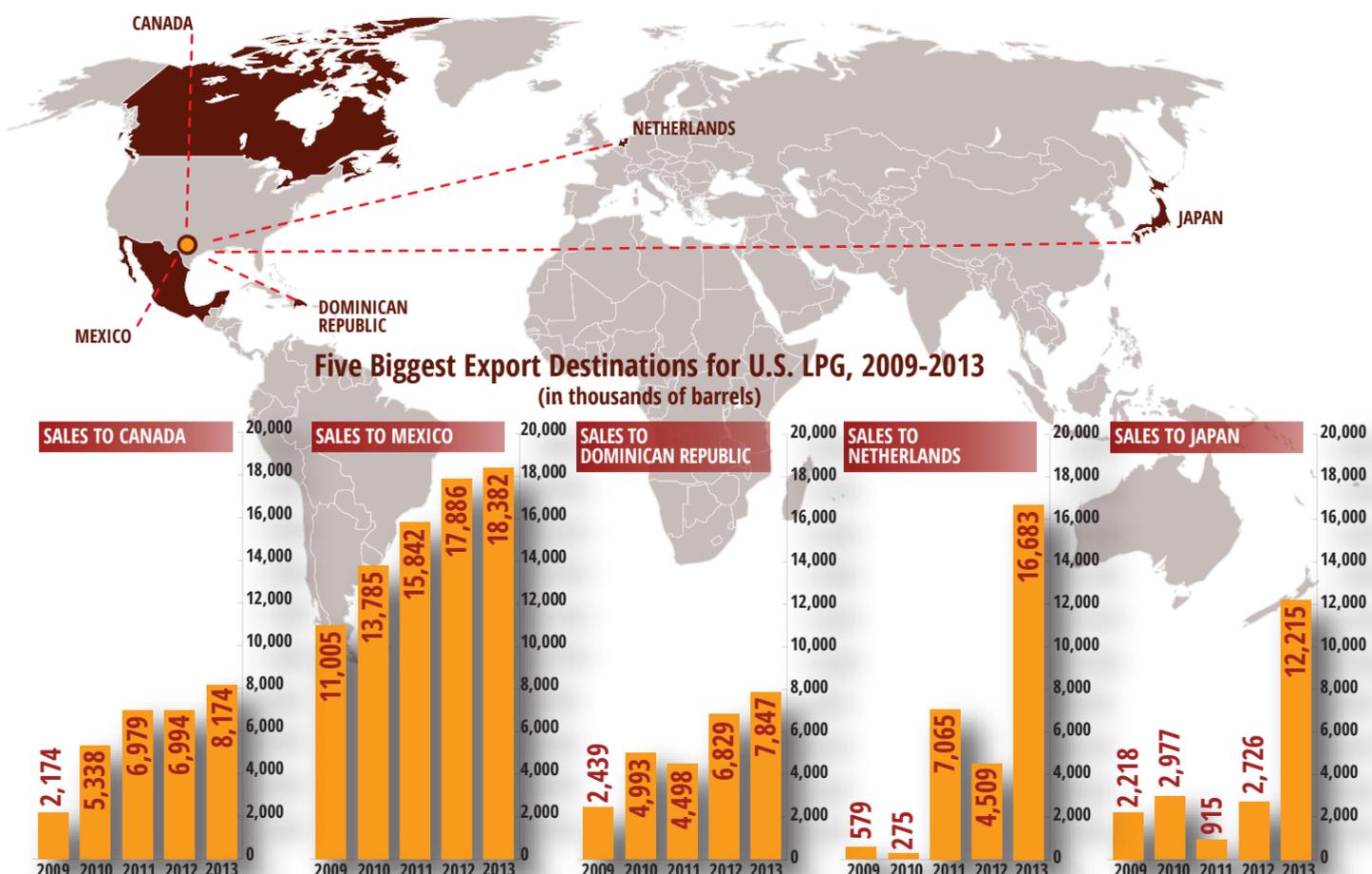
And with that activity comes more jobs. Between 2007 and 2012, Texas recorded the largest increase of any state in oil and natural gas employment. The industry accounted for more than \$27 billion in Texas wages in the first three quarters of 2013.

So Texas is more or less awash in natural gas, as well as natural

**Liquefied petroleum gas (LPG)** is a liquefied mixture of hydrocarbon gases used primarily as fuel and as a chemical feedstock.

## WHERE IT GOES

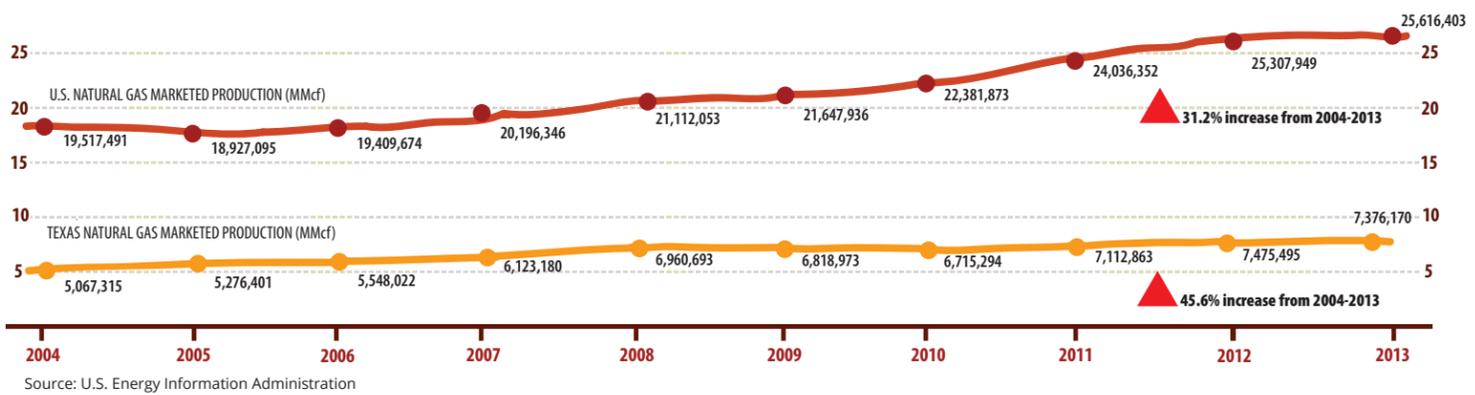
Predictably, Mexico and Canada are among the largest buyers of U.S. LPG, but other nations are major purchasers as well. Sales to the Netherlands in particular have skyrocketed, rising by an astonishing **2,781 percent** in the **last five years**.



SOURCE: U.S. Energy Information Administration, [http://www.eia.gov/dnav/pet/pet\\_move\\_expc\\_a\\_EPLL\\_EEX\\_mbb1\\_m.htm](http://www.eia.gov/dnav/pet/pet_move_expc_a_EPLL_EEX_mbb1_m.htm)

## NATURAL GAS PRODUCTION SOARS

In the last decade, natural gas production rose by a third in the U.S. and by more than 45 percent in Texas.



gas liquids and a subset of these, liquefied petroleum gas (LPG). And it's not all staying at home: Texas LPG is becoming an increasingly significant export to world markets.

### LPG opportunities

LPG, primarily propane and butane, is a byproduct of natural gas purification and oil refining. It's a valuable feedstock for the petrochemical industry, and can be used for heating, cooking and vehicle fuel as well.

The growth of oil and gas production, and especially processing that extracts LPG from natural gas, has boosted output to new heights. Texas' LPG production nearly doubled in the last decade, and now accounts for slightly more than half of the U.S. total.

And although U.S. producers generally can't export crude oil, due to the 1970s-era federal Energy Policy and Conservation Act, LPG is fair game.

In 2012, the U.S. became a net exporter of LPG for the first time, according to the EIA. From 2008 to 2013, LPG exports rose by 395 percent for the U.S. as a whole and by 642 percent for the Gulf Coast region. Texas is also reaping the benefits, with LPG exports rising by an astonishing 86 percent in 2013 alone.

The export boom is fueling a surge in construction, as companies build and expand LPG export facilities along the coast.

Two major energy players are expanding existing export terminals. Enterprise Products Partners' terminal on the Houston Ship Channel currently has an export capacity of 7.5 million barrels of LPG a month; the expansion should increase that capacity to 16 million barrels by 2015. And Targa, whose Galena Park facility reported daily LPG exports of 115,600 barrels in first-quarter 2014, is refurbishing another recently acquired facility at an estimated cost of \$25 million.

Still other big names in oil and gas are building new LPG terminals — Sunoco/Lone Star in Nederland, Phillips 66 in Freeport and Occidental Petroleum in Ingleside near Corpus Christi.

### Why export?

Doug Ridge, a domestic and international financial and strategic consultant in energy exploration and currently workforce and education specialist for the West Texas Energy Consortium, says



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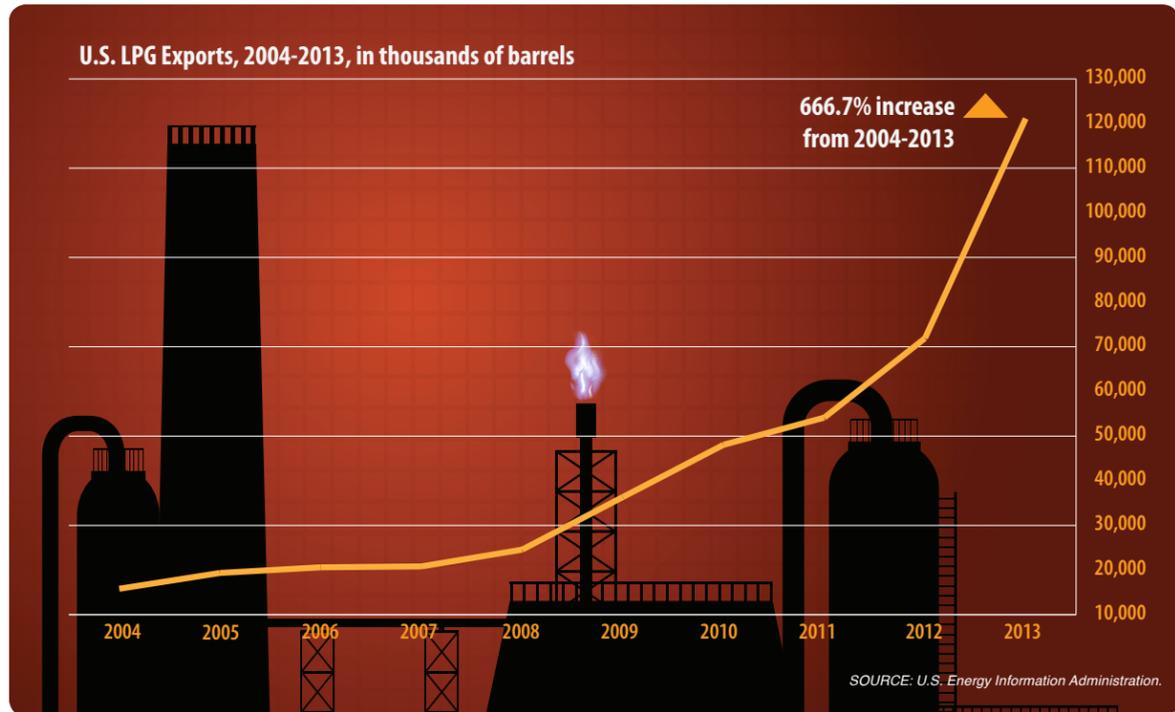
### TEXAS' LPG EXPORT CAPACITY GROWS

As global demand for LPG heats up, Texas companies are building and expanding the terminals needed to export it. These facilities include:

- HOUSTON — Enterprise Products**
  - LPG export terminal on Houston Ship Channel; current export capacity 7.5 million barrels/month
  - Expansion project (expected Q1 2015) will add 1.5 million barrels/month export capacity
  - By Q4 2015, additional expansion should increase export capacity to 16 million barrels/month
- GALENA PARK — Targa**
  - Exports 115.6 thousand barrels/day as of Q1 2014
  - Recently acquired existing facility is being refurbished at an estimated cost of \$25 million; will raise Targa exports to 6 million barrels/month by Q3 2014
- NEDERLAND — Sunoco/Lone Star**
  - Facility scheduled to open in 2015; initial capacity of 6 million barrels/month
- FREEPORT — Phillips 66**
  - Facility scheduled to open mid-2016; represents a \$1 billion investment
  - Initial export capacity of 4.4 million barrels per month
- INGLESIDE — Occidental Petroleum**
  - Facility scheduled to open 2015 at former naval station
  - Design capacity of 110,000 barrels/day

## LPG EXPORT FLOOD

U.S. exports of LPG have risen by nearly 667 percent in the last decade.



producers are exporting gas because they can enter a larger market and get a better return for their product.

“As the gas supply in North America grows, the market for gas is constrained, while the international market is based on a higher price product base,” Ridge says. “So the producers’ case is pretty obvious — go to the markets where demand is higher than the supply, and take the profit.”

Darryl Rogers, managing director for North American gas and midstream consulting at IHS Inc., agrees.

“Over time, domestic LPG markets are not growing that quickly,” Rogers says. “Shale and its associated gases have byproduct LPG that has to fit into the marketplace.”

Exporting LPG generally isn’t difficult.

“We’ve been exporting LPG via truck and pipeline to Mexico for decades, and it’s easy to move around via barge,” says Michelle Michot Foss, Ph.D., chief energy economist and program manager at the University of Texas Bureau of Economic Geology’s Center for Energy Economics. “The capital cost is relatively low, and the fuel is easy to containerize.”



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**DARRYL ROGERS,**  
managing director,  
North American Gas and  
Midstream Consulting,  
IHS Inc.

### International markets

And demand for LPG is rising quickly.

“LPG is the dominant domestic energy fuel in Latin America, the Caribbean, Africa and most of Asia,” Foss says. And Europe wants it as well; the Netherlands, for example, has increased its imports of American LPG nearly thirty-fold in just five years.

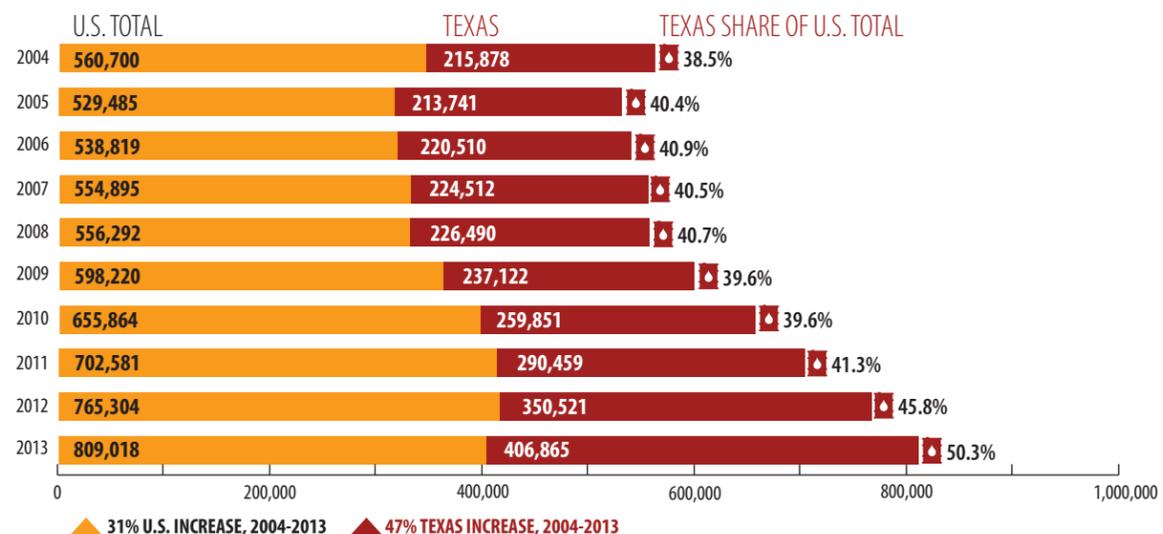
So who’s competing with us for customers?

Many importing countries in South America and Southeast

## SURGE IN LPG

Increased natural gas recovery driven by fracking has boosted LPG production as well. Texas LPG production from natural gas has risen 47 percent in the last decade. The state now produces more than half of the U.S. total.

### LPG Production from Natural Gas Processing, 2004-2013, in thousands of barrels





Asia could produce LPG in volumes at least sufficient for their own demands. But certain factors often get in the way, including corruption and poor commercial practices.

According to Foss, these governments often “force the price of LPG below market cost in order to keep sensitive constituents happy. This practice, of course, contributes to the chronic underinvestment around the world as well as considerable black market activity.”

Ridge says that the current energy boom has given America a real advantage in international markets, but it can't be expected to last forever.

“My own opinion is that we have about a seven-year head start on the Far East and Australia, among others,” he says. “In that time, we need to find ways to solidify and diversify the competitive advantage we have in these markets, [and] that means exporting, improving the infrastructure that feeds these industries and making sure the technologies and workforce are going to be available and competitive for the next round of industry change.”

### **Shale gale forecast**

In all, the outlook is positive for increasing LPG production, Rogers says.

“When we look at upstream activity and petrochemical investments across the value chain, it's very good,” he says. “But starting two years ago, we've had excessive gas and byproduct production of propane and butane. We've seen growth in terminal activity around the country, but mainly in the U.S. Gulf Coast and Texas.

“Our outlook is that it will continue to grow and expand. It's a really exciting time for Texas.”

*For more on the basics of LPG,  
see the Comptroller's 2008 Energy Report,  
<http://www.window.state.tx.us/specialrpt/energy/>.*

*A ship at Targa's Galena Park import/export terminal, located on the Houston Ship Channel.*

Photo courtesy of Targa Resources, Woodallen Houston 2008

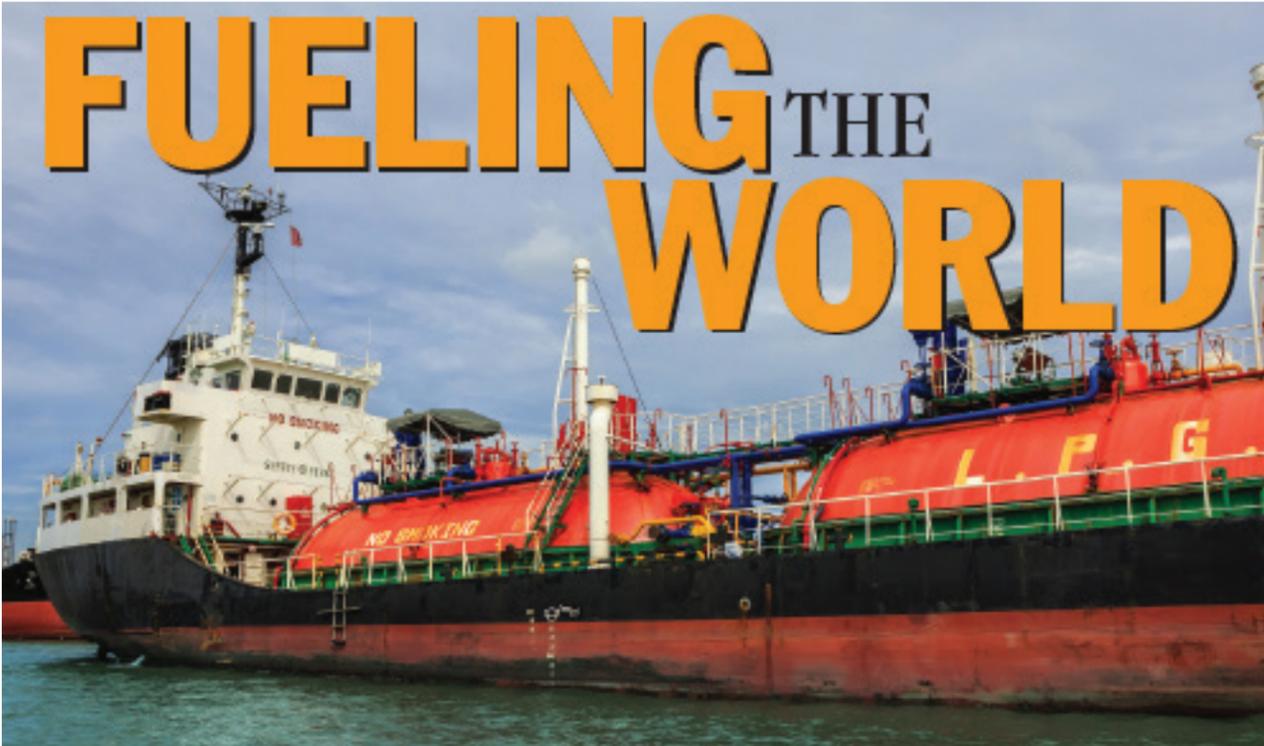


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**MICHELLE MICHOT FOSS, Ph.D.,**

chief energy economist and program manager, University of Texas Bureau of Economic Geology's Center for Energy Economics

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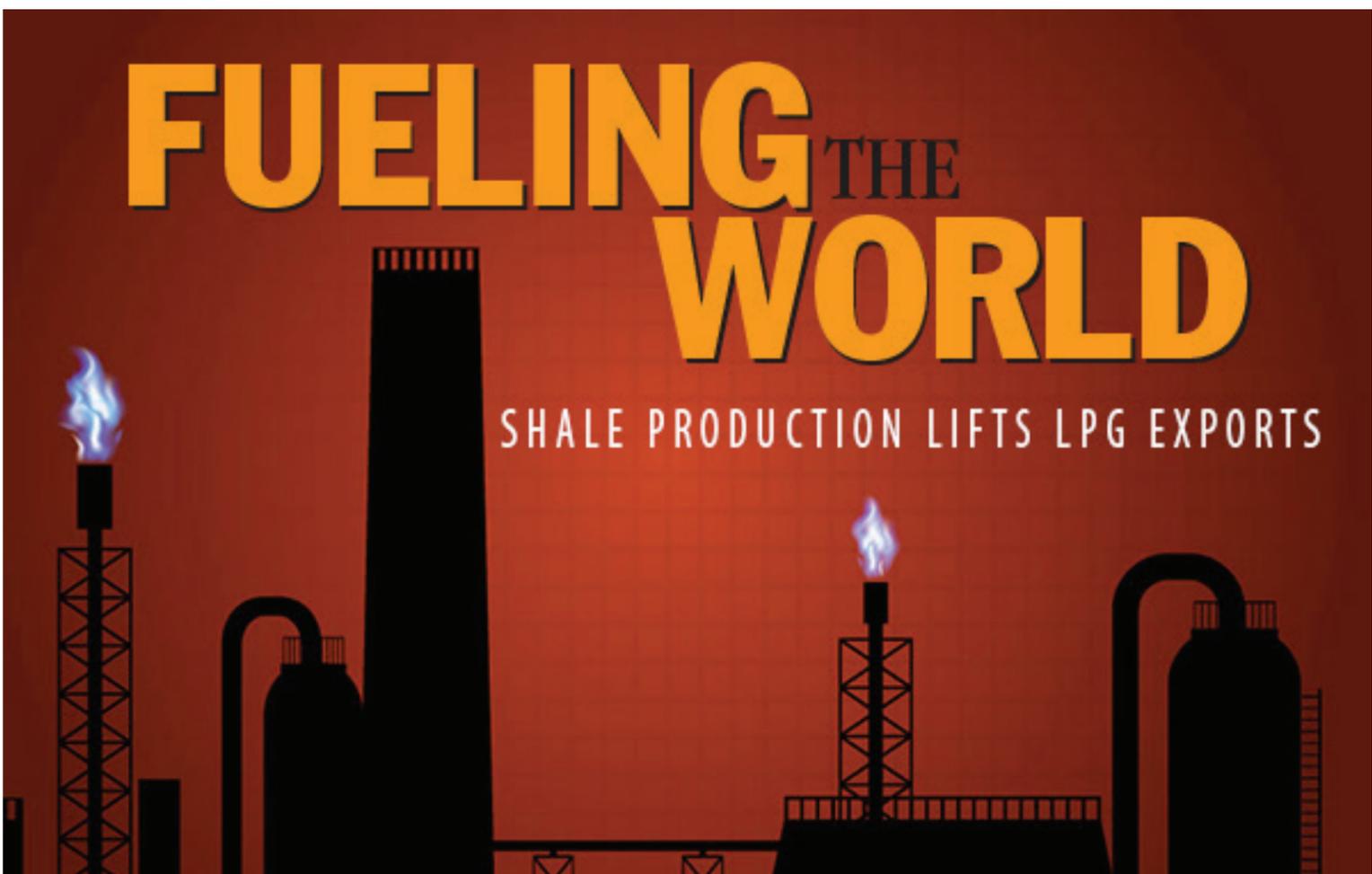
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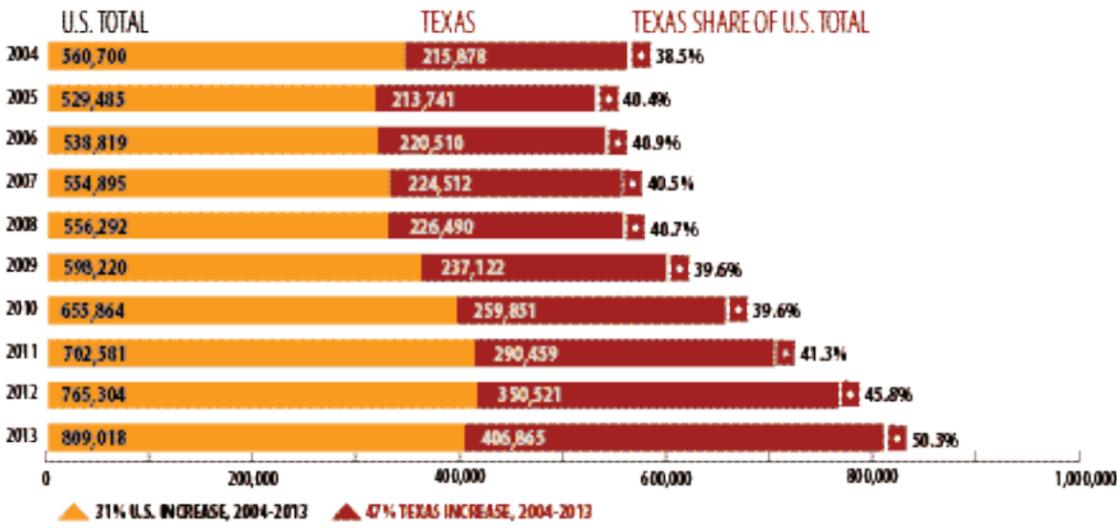


## SURGE BAR GRAPHIC

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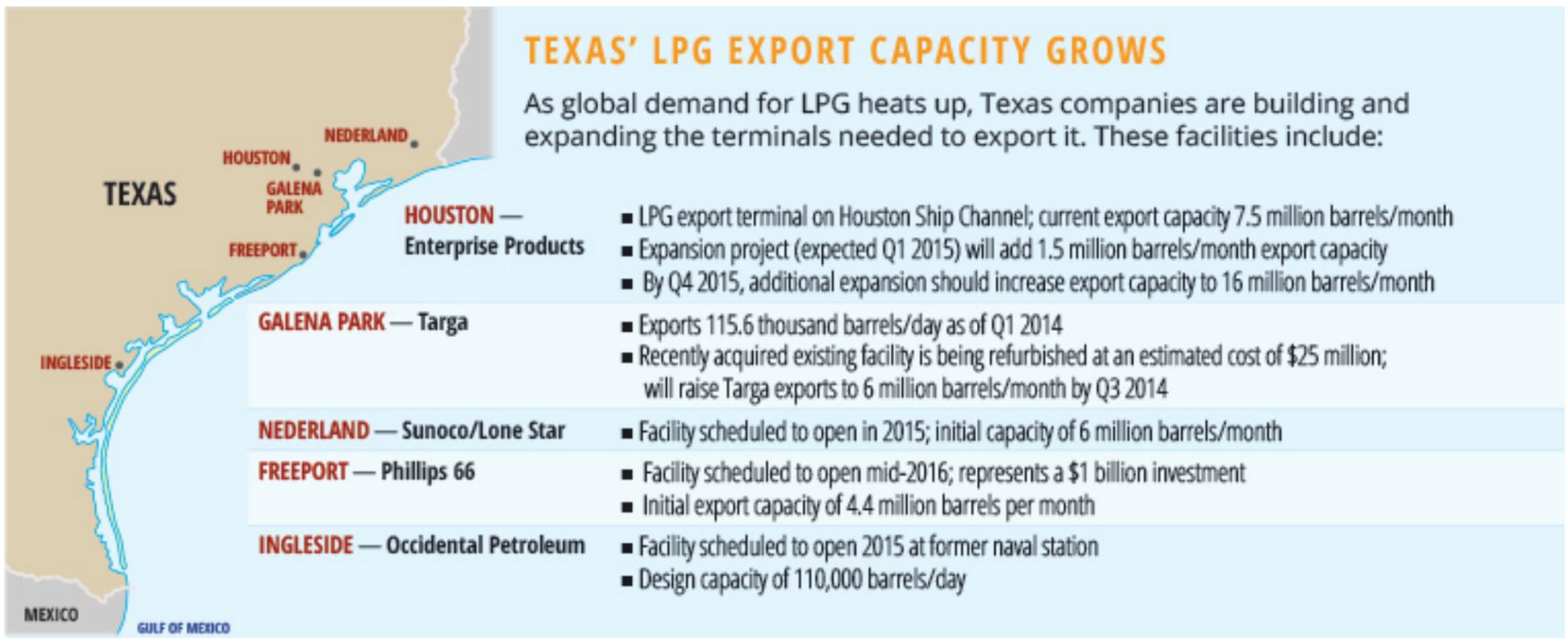
#### LPG Production from Natural Gas Processing, 2004-2013, in thousands of barrels



## TARGA PHOTO

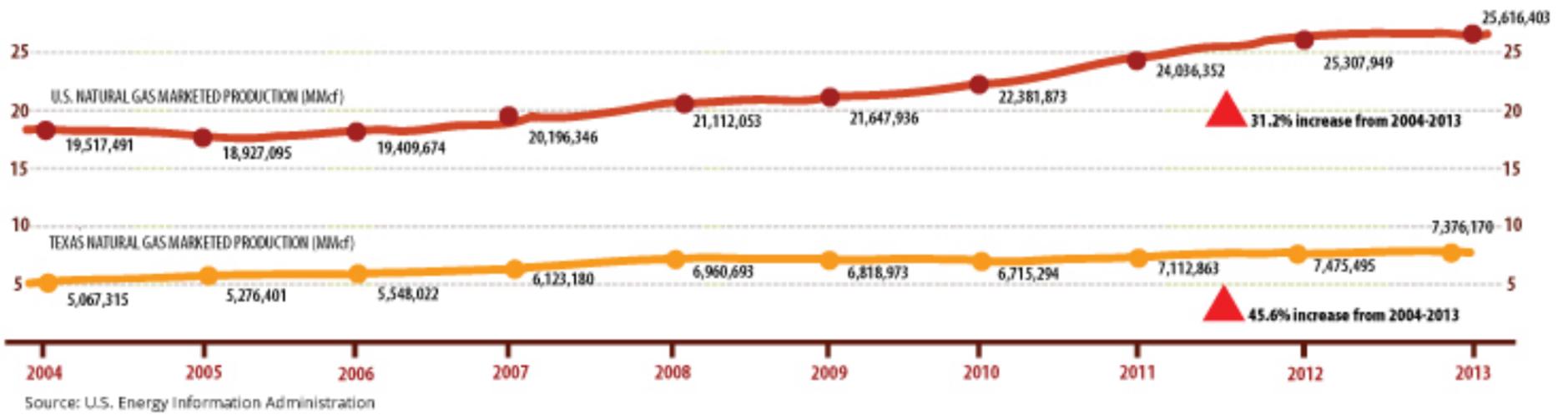


## TEXAS EXPORT CAPACITY MAP



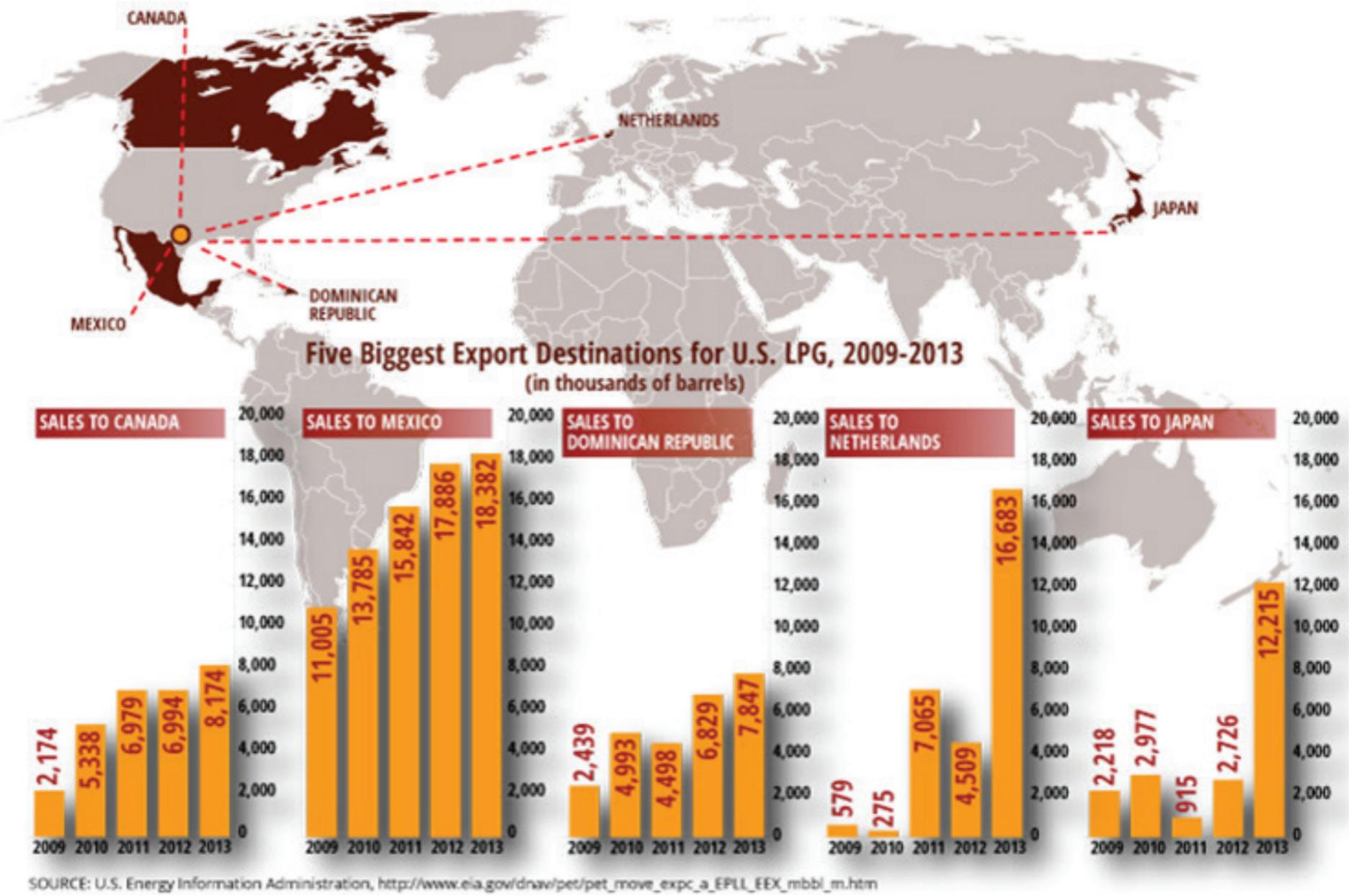
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**LPG FLAME GRAPHIC**



**ROGERS MUG**



**FOSS MUG**



**REFINERY GRAPHIC**

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