U.S. Oil Production and Energy Security
Perspectives on the Challenges and Opportunities Ahead
After decades of inexorable decline, U.S. oil production is rapidly surging. Output in 2013 is expected to be nearly 50 percent higher than 2008.

Over the past three years, we have seen the fastest oil production growth in U.S. history. In fact, this is one of the three largest booms globally since 1965.

Recent growth has primarily been driven by onshore growth in the lower-48 as a result of tight oil development in Texas and North Dakota.
Weak economic growth and a modest increase in efficiency have softened U.S. oil demand. Combined with surging supply, imports are plummeting.

- U.S. oil demand has yet to recover from the effects of the 2007-2008 oil price spike and ensuing recession. VMT growth has stalled.
- U.S. net imports of crude oil and refined products have plummeted to multi-decade lows, keeping hundreds of billions at home.

### U.S. LIQUID FUEL DEMAND (1993-2014)

![Graph showing U.S. liquid fuel demand from 1993 to 2014](image)

### U.S. TRADE IN CRUDE OIL AND LIQUID FUELS (1995-2014)

![Graph showing U.S. trade in crude oil and liquid fuels from 1995 to 2014](image)

Source: DOE, EIA
Mission Accomplished?
High and volatile oil prices have taken a toll on the U.S. economy in recent years, even overwhelming some of the gains made in efficiency and imports.

Although U.S. oil intensity is declining, spending is rising, even as a share of GDP. Rising oil prices have been outpacing efficiency gains.

U.S. households spent an average $2,900 on gasoline in 2012, up from $1,200 in 2002. More recently, increased spending has offset stimulus.

Source: EIA, AER 2010; Department of Commerce, Bureau of Economic Analysis; SAFE

Source: BLS
U.S. households and businesses spent more than $900 billion on oil in 2012. Households accounted for $400 billion.

Source: BLS

In addition to staggering wealth transfers, high and volatile oil prices generate significant uncertainty for households and businesses. The result is lost economic opportunity.
Oil and the U.S. Economy

Every recession since 1973 has been either preceded by or concurrent with a spike in oil prices.
Oil and the U.S. Economy

High oil prices added $1.2 trillion to the national debt.

• It is estimated that continued U.S. dependence on oil could add another $5 trillion to the debt by 2040
• The same report found that if oil prices had increased at the same rate as other goods and services from 2002 to 2012, instead of quadrupling as they actually did:
  – The U.S. federal budget deficit in 2012 would have been $235 billion dollars lower;
  – The increase of U.S. debt between 2003-2012 would have been $1.2 trillion lower; and
  – The debt-to-GDP ratio in 2012 would have been 6.6 percentage points lower.
According to DOE, oil will remain the nation’s largest source of energy in 2030, accounting for more than 90 percent of transport fuel.

- Recently finalized fuel-economy standards will increase auto efficiency while offering nominal support to zero-emissions PEVs through bonus credits.
- Oil intensity will fall as the economy grows.
- Still, DOE does not envision major changes in terms of the share of petroleum in primary energy demand or its role in transport.

Source: DOE, EIA
While OECD oil demand has idled, emerging market demand has surged. Rising spending power in these markets will lead to higher oil demand.

- Chinese oil demand increased by 90 percent 2000-2010. The increase was equivalent to adding another Japan to the market.
- Auto sales in China have surpassed those in the U.S. for three straight years, and fleet there is expected to become the world’s largest within a decade.

**CHINESE LIQUID FUEL DEMAND (HISTORICAL)**

- Million Barrels per Day

**PROJECTED PASSENGER VEHICLE FLEET BY REGION**

- Million Units
- Source: IEA, World Energy Outlook 2012
Constrained OPEC Production

OPEC nations hold large, inexpensive reserves. However, member states function as a cartel, limiting production in order to manipulate prices.

› OPEC’s share of global proved conventional oil reserves has averaged nearly 80 percent for the past several decades.

› Meanwhile, OPEC’s share of liquids production has averaged closer to 40 percent.

› This disparity is particularly striking given that OPEC reserves are among the world’s least costly to develop.

Source: BP plc., Statistical Review 2012
Note: Excludes Canadian Oil Sands not under active development. Also excludes Venezuelan extra-heavy oil.
Global Liquids Supply Cost Curve

With the cheapest oil in the world underdeveloped in OPEC countries and other NOCs, non-OPEC oil supplies are moving farther up the cost curve.

Source: International Energy Agency, Medium Term Outlook 2011
How should we think about the impacts of the boom?

— “We believe that growth in US domestic oil production is unlikely to affect global crude oil prices.”
  - Mark Papa, CEO of EOG Resources

— “Unconventionals will make the oil market more comfortable in the near term, but won't bring us back to the days of $50 per barrel.”
  - Maria Van Der Hoeven, Executive Director, IEA

— "These changes in no way alter the U.S. commitment to global security, to peace and stability in the Middle East and to security in [oil] transit lanes. Stability of the global oil market still affects America at home."
  - Ambassador Carlos Pascual, Coordinator for International Energy Affairs, Department of State

— "Even if we produce a tremendous amount of additional oil ourselves, we're still going to be linked to the global oil market. We're still going to care what happens in the Middle East.”
  - Marvin Odum, President, Shell Oil Company

— “The United States needs to prepare for the reality that Syria is simply one more example of the fact that the “Arab spring” is in actuality either the “Arab decade” or the “Arab quarter century.”
  - Anthony Cordesman, Arleigh A. Burke Chair in Strategy, CSIS
Key Uncertainties as We look Forward

The oil market is a multiplayer game with countries, companies, and other actors making decisions based on changing events and circumstances.

› How fast will global oil demand grow?
› How much of an effect will geopolitical volatility have going forward?
› What can we expect from tight oil in the U.S.?
› What about tight oil globally?
› How will OPEC react to surging supplies outside the cartel?
› What impact will government policy have?
Plug-in electric vehicles (PEV) have been in the market for nearly three years and over 140,000 units have been sold.

- Monthly sales of PEVs have exceeded 7,000 units 10 of the last 12 months.
- PEV sales in August exceeded 11,000 units.
- In the first six months of 2013, the Tesla Model S captured 8.4 percent of the luxury market.

Source: hybridcars.com
**PEV Sales Relative to Hybrid Sales**

Today’s PEVs have been in the market for nearly three years and have had a more successful introduction than traditional hybrids did in the early 2000s.

- PEV model availability was three to four fold higher than HEV availability in the first years on the market.
- PEV sales were more than double HEV sales the first two years they were on the market.

### AVAILABLE HEV AND PEV MODELS FIRST YEARS IN MARKET

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<th>Year</th>
<th>PEV</th>
<th>HEV</th>
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<td>Year 1</td>
<td>6</td>
<td>2</td>
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<tr>
<td>Year 2</td>
<td>11</td>
<td>3</td>
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<tr>
<td>Year 3</td>
<td>14</td>
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### U.S. SALES OF HEVs AND PEVs FIRST YEARS IN MARKET

<table>
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<tr>
<td>Year 1</td>
<td>17,875</td>
<td>9,350</td>
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<tr>
<td>Year 2</td>
<td>53,172</td>
<td>20,282</td>
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<tr>
<td>Year 3</td>
<td>90,000 (Expected)</td>
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Significant Deployment of Charging Stations

Charging station deployment has increased dramatically in recent years. Drivers in many cities have lots of options for charging their PEVs.

Availability of alternative fuel stations increased dramatically, curbing range anxiety.

64% of Level II charging stations are residential.

157 DC Fast Chargers are currently installed nationwide.

Source: DOE, EERE
Overall, PEV drivers are enthusiastic about the performance and features of their electric vehicles.

Satisfaction has been significantly higher for PEVs than for their ICE/HEV counterparts.

PEV drivers like the design, powertrain quality, and driving performance.

JD POWER CONSUMER SATISFACTION SURVEYS

- Initial Quality Study
  - Overall Quality
  - Overall Quality - Design
  - Overall Quality - Mechanical
  - Body & Interior - Design
  - Body & Interior - Mechanical
  - Features & Accessories - Design
  - Features & Accessories - Mechanical
  - Powertrain Quality - Design
  - Powertrain Quality - Mechanical
  - Comfort
  - Overall Performance and Design
  - Features and Instrument Panel
  - Performance
  - Style

APEAL Study

- PEVs: Chevrolet Volt, Nissan LEAF
- HEVs: Honda Insight & CR-Z, Toyota Prius & Prius V, Lexus c200h
- ICE: BMW 3-Series, Mini Cooper, Buick Verano, Infiniti G37, Volvo C30
Securing America’s Future Energy (SAFE) is an action-oriented, nonpartisan organization founded to deliver an urgent call to action: our nation’s dependence on oil puts our economy and national security at risk. Since its founding in 2004, SAFE has enlisted the support of prominent business and retired senior military leaders and employed innovative strategies addressing business and technology, politics and advocacy, and public education and media to help reshape the debate on energy policy.