Project Facts

Recovery of Undeveloped Domestic Oil Resources Can Provide the Foundation for Increasing U.S. Oil Production

The report, ***Undeveloped Domestic Oil Resources: The Foundation for Increasing Oil Production and a Viable Domestic Oil Industry***, assembles information on the size and nature of remaining domestic oil resources and the opportunities to convert these resources into reserves and economic production. As such, it provides information that could be useful to lessen U.S. dependence on foreign energy and reduce the increasing "energy tax" that imports impose on consumers and the domestic economy.

In a recent national address on energy, President Bush stated: *"Our dependence on foreign energy is like a foreign tax on the American people. It is a tax our citizens pay every day in higher gasoline prices and higher costs to heat and cool their homes. It's a tax on jobs and a tax that is increasing every year."*

Large volumes of technically recoverable domestic oil resources remain undeveloped and are yet to be discovered -- estimated at 400 billion barrels, from an undeveloped remaining oil in-place of over a trillion barrels. This large, undeveloped oil resource base provides new opportunities for the domestic oil industry, which could greatly improve the nation's trade balance and energy security. The principal findings documented in this report include:

1. <u>The United States is and could remain a major oil producing country</u>. Domestic oil, while in the midst of transformation, still provides over 7 million barrels per day of petroleum production. The United States is the world's third largest oil producer (in 2004), behind Saudi Arabia and the Russian Federation:

- Saudi Arabia 10.58 million barrels per day
- Russian Federation 9.28 million barrels per day
- United States 7.24 million barrels per day.

2. <u>While a mature hydrocarbon province, the United States still has 400 billion barrels of undeveloped technically recoverable oil</u>. Undeveloped domestic oil resources still in the ground (in-place) total 1,124 billion barrels. Of this large in-place resource, 400 billon barrels is estimated to be technically recoverable. This resource includes undiscovered oil, "stranded" light oil amenable to CO_2 enhanced oil recovery (EOR) technologies, unconventional oil (deep heavy oil and tar sands) and new petroleum concepts (residual oil in reservoir transition zones).

- Of the 582 billion barrels of oil in-place in discovered fields, 208 billion has been already produced or proven, leaving behind 374 billion barrels of "stranded" oil after application of conventional (primary/secondary) oil recovery technology. With appropriate EOR technologies, 100 billion barrels of this "stranded" resource may become technically recoverable.

- Undiscovered domestic oil is estimated to hold 360 billion barrels in-place, with 119 billion barrels recoverable with primary/secondary recovery. Application of EOR could add another 60 billion barrels of technically recoverable resource.

- Future reserve growth of discovered oil fields is estimated to hold 210 billion barrels of oil in-place, with 71 billion barrels recoverable with primary/secondary recovery. Application of EOR could raise this technically recoverable volume by up to 40 billion barrels.

- With advances in thermal EOR technology, domestic tar sands, holding 80 billion barrels of resource in-place, could provide up to 10 billion barrels of technically recoverable domestic oil resource. No estimates of recoverable oil from the residual oil zone are provided.

- For comparison, current proved crude oil reserves are 22 billion barrels and annual domestic crude oil production is about 2 billion barrels.

Original, Developed and Undeveloped Domestic Oil Resources (Billion Barrels)*

	Original Oil In- Place	Developed to Date	Remaining Oil In-Place	Future Recovery**		
				Conventional Technology	EOR*** Technology	Total
I. Crude Oil						
1. Discovered	**582**	**(194)**	**374**	-	**100**	**100**
• Light Oil	482	(189)	293	-	80	80
• Heavy Oil	100	(19)	81	-	20	20
2. Undiscovered	**360**	-	**360**	**119**	**60**	**179**
3. Reserve Growth	**210**	-	**210**	**71**	**40**	**111**
4. Residual Oil Zone	**100**	-	**100**	-	Unknown	Unknown
II. Tar Sands	**80**	-	**80**	-	**10**	**10**
TOTAL	**1,332**	**(194)**	**1,124**	**190**	**210**	**400**

**Does not include oil shale. **Technically recoverable resources rounded to the nearest 10 billion barrels.*
**** Based on six basin-oriented assessments released by DOE in April 2005.*

Note: The above estimates, based on earlier work, do not include the additional resource potential outlined in ten basin-oriented assessments or recoverable resources from residual oil zones, as discussed in related reports issued by DOE in February 2006. Accounting for these, the future recovery potential from domestic undeveloped oil resources by applying EOR technology is 240 billion barrels, boosting potentially recoverable resources to 430 billion barrels.

3. Policies and "risk mitigation" actions that promote development and use of more efficient enhanced oil recovery (EOR) technologies and that support access could help convert these resources into reserves and production. Such potential actions include:

- Reducing the financial and investment barriers of EOR, with federal/state "risk mitigation" actions, could increase private sector investments.

- Reducing the geological and technical risk barriers of EOR could be accomplished through aggressive research and field tests.

- Encouraging the productive use of CO_2 from natural sources and industrial emissions could greatly increase the supplies of "EOR-Ready" CO_2.

- Integrated new energy production systems could reduce the energy penalty associated with producing heavy oil and capturing "EOR-Ready" CO_2.

- Collaboration between U.S.-based and Canadian entities on oil sands, tar sands and heavy oil technology could help increase the recovery of domestic oil.

- Improving the information base on already discovered domestic oil fields could accelerate the pace of "reserve growth".

- Increased investments in technology transfer could accelerate the pursuit of improved domestic oil recovery efficiencies.

4. New public/private partnerships targeted at maximizing recovery of domestic oil resources would have large benefits to the Nation's economy, to state budgets and to consumers. These benefits include:

- The trade balance could ultimately improve by $8 trillion, cumulatively, assuming one-half of the future technically recoverable resource becomes economically recoverable and oil prices average $40 per barrel.

- State and local treasuries could gain $700 billion and the federal budget could gain $1.4 trillion of revenues from future royalties and taxes from producing one-half of this future technically recoverable resource.

- The decline in domestic oil development and production would be reversed, creating new, well-paying direct and indirect jobs.

Further information

This resource assessment was prepared by Advanced Resources International for the U.S. Department of Energy Office of Fossil Energy. Copies of the assessment are available at www.fossil.energy.gov. For information about DOE Oil and Natural Gas Program research on emerging EOR technologies, see www.netl.doe.gov.

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