

Ethanol in Minnesota

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Ethanol in Minnesota

1. State Government and the Rise of Ethanol
 - How did Minnesota become a leader?
2. Assessing Ethanol's Competitive Strength
 - Is it economically viable today?
3. Key Trends for the Ethanol Industry
 - What's next for renewable fuels?

Ethanol in Minnesota

- State Government and the Rise of Ethanol in Minnesota
 - Goals for program:
 1. Boost the farm and rural economy
 2. Reduce dependence on foreign fossil fuels
 3. Improve urban air quality

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- The beginning: 1979 oil scare
 - OPEC oil embargo leads to long lines and high prices at gas pumps
 - Concerns grow about U.S. dependence on imported oil
 - Federal legislation bans leaded gasoline

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- Minnesota responds:
 - 1980 Minnesota Legislature creates “Blender’s Credit”
 - Blenders get tax credit of 4 cents/gallon for gas blended with 10% ethanol
 - Leads to increased use of ethanol-blended fuels

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- Problems arise:
 - Gasoline marketers resist
 - By 1986, ethanol's market share down to 7%
 - State production capacity stalls at 1 million gallons

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- 1980s farm crisis gives ethanol new life:
 - Minnesota loses 8,000 farms between 1984 and 1986
 - Two-thirds of corn crop exported as low-priced raw commodity
 - Virtually no in-state corn processing

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- MDA sets goals for revitalized program:
 - Increase market share for ethanol blends
 - Educate consumers
 - Build ethanol production capacity and infrastructure
 - Encourage farmer-owned, value-added processing

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- Air quality emerges as third driver:
 - Clean Air Act requires Minneapolis-St. Paul to include 2.7% oxygen in all gas sold from October 1 to February 1
 - Expanded to year-round in 1995
 - Expanded statewide in 1997

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- Minnesota's Ethanol Dream Team:
 - Farm organizations
 - Commodity Groups
 - Rural electrification associations
 - Governor's Office
 - State Attorney General's Office
 - Department of Agriculture and other agencies

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- The MDA's Role:
 - Public education
 - Increasing ethanol production
 - Encouraging farmer-owned developments

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- Addressing fears:
 - Enforcement burden?
 - Underground tanks damaged?
 - Availability of non-oxy fuel?
 - Gas prices forced up?
 - Consumer acceptance?

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- Public education:
 - Educational materials
 - Public and private presentations
 - Sponsorships, technical experts, spokespeople
 - Oxy-fuel Hotline

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- Increasing Production:
 - Goal: boost from 1.5 million gallons to 200 million gallons (later increased to 450 million)
 - Key elements
 - Per gallon producer payments
 - Financial, technical and organizational support
 - Producer payments, 10% mandate give assurance to lenders

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- State producer incentive payments:
 - 20 cents per gallon
 - Limited to first 15 million gallons produced each year
 - 10-year limit for payment eligibility

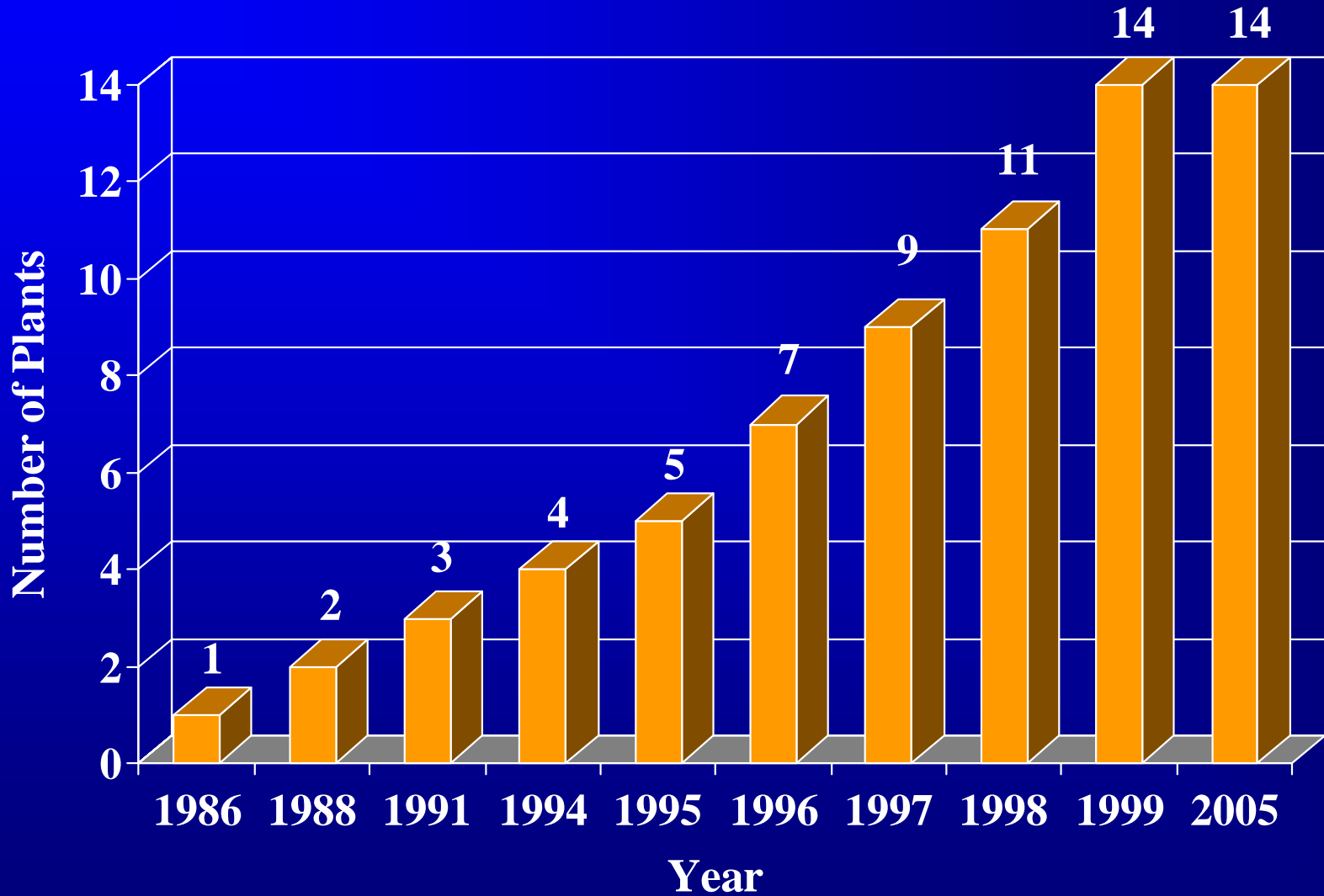
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- Lenders' concerns during ramp-up phase:
 - Will the ethanol industry take root?
 - Can new farmer coops deal with the many management challenges?
 - Can small plants compete with large wet mills?
 - Will we get interest and principal payments?

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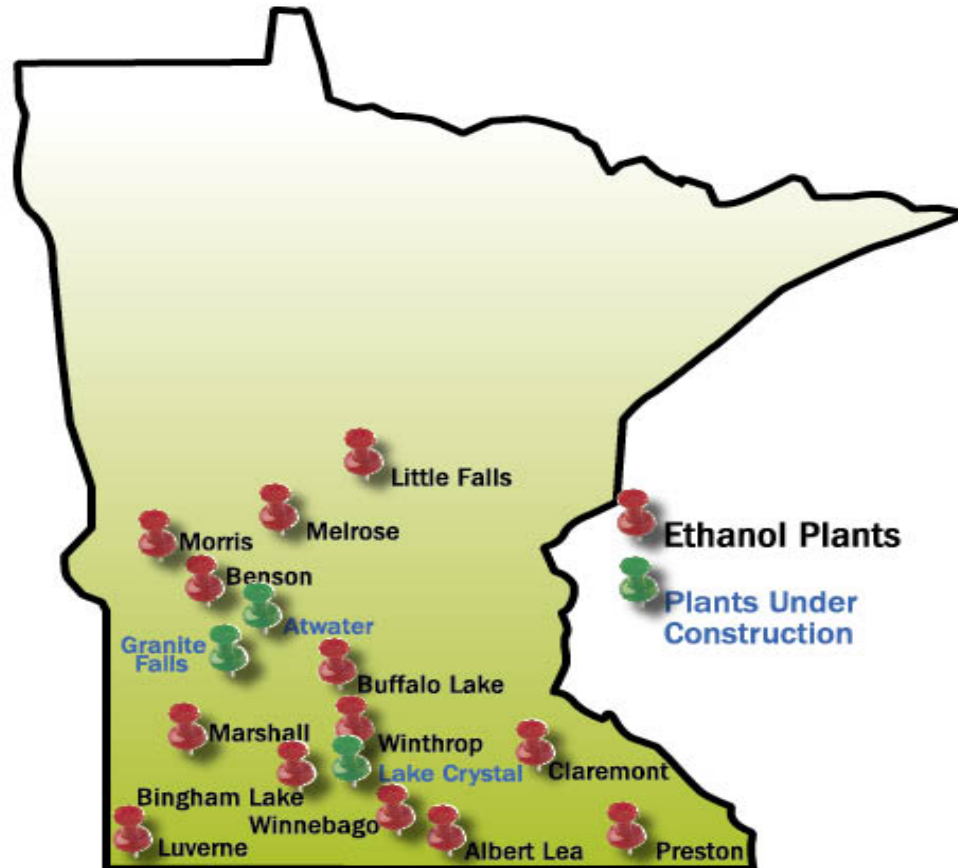
- Assistance to local developers:
 - Financial
 - \$500,000 loans to developers
 - Stock loan program helps farmers buy into co-ops
 - Technical and organizational
 - MDA staff help draft project work plans, schedules
 - MDA staff help conduct organizational meetings
 - Liaison with state and federal agencies
 - MDA staff review marketing, business plans

Number of Ethanol Plants in Minnesota



Ethanol Plants in Minnesota

February, 2005



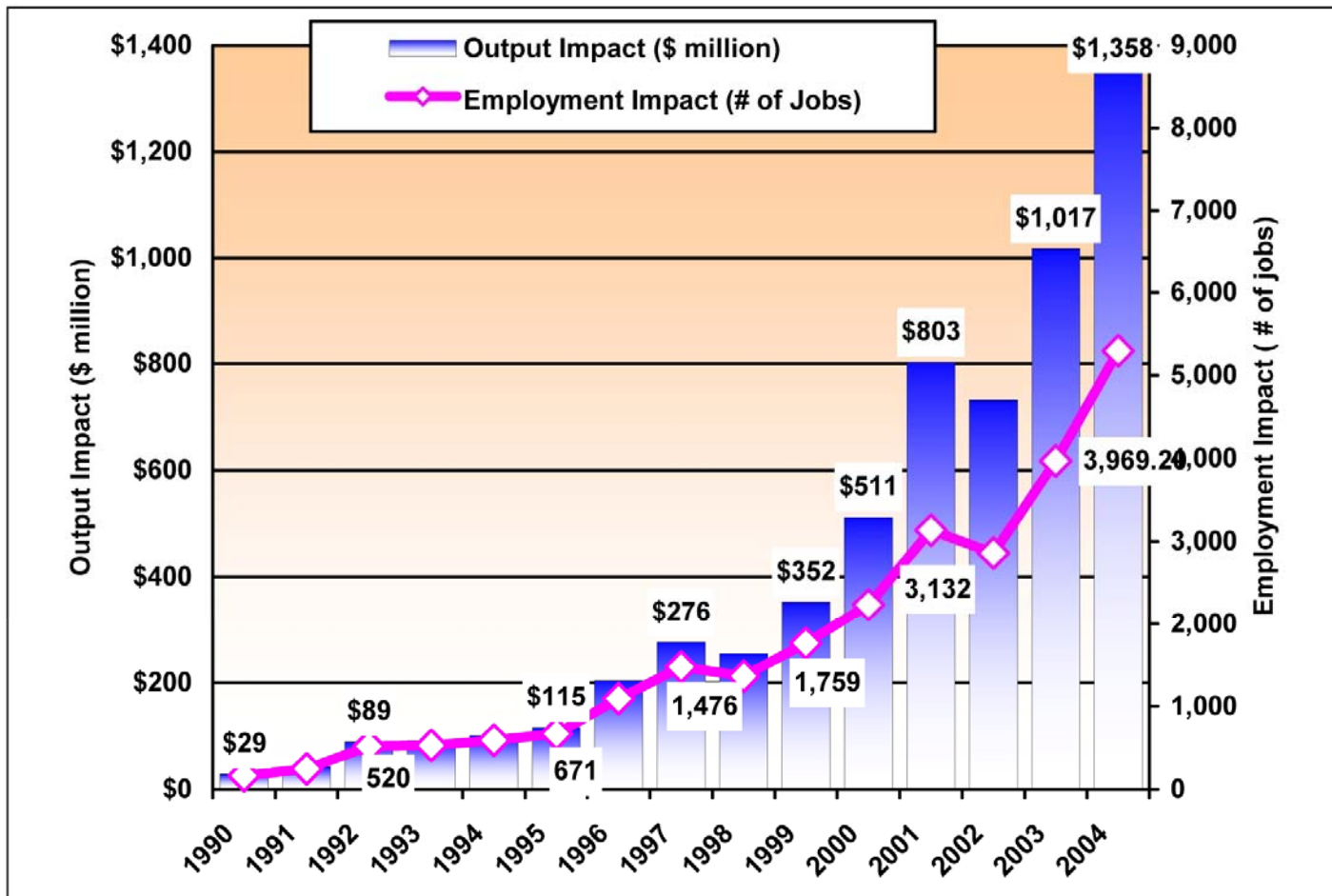
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- The results:
 - 14 ethanol plants, 11 farmer-owned
 - Production capacity surpasses 450 million gallons by June 2005
 - 20% of corn crop used for industrial processing
 - \$200 million in value added to commodities
 - 750 new jobs in the plants, 4,000 external jobs supported by plants

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Minnesota Ethanol: Output Impact & Employment Impact



Source: AMS, MDA

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- Impacts of farmer-owned processing:
 - Corn-to-ethanol adds average of \$1.74 in value per bushel
 - Each 15-million gallon plant adds up to \$10 million in value to 5.5 million bushels of corn each year
 - Money pumped into local communities

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- Benefits of ethanol as an investment:
 - Hedge on corn prices
 - Farmers capture more of total profit
 - Diversifies farm income, smoothing out peaks and valleys typical for commodity prices

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- Goals achieved:
 - Boost farm and rural economy ✓
 - Value added to 20% of corn crop
 - 11 farmer-owned value-added cooperatives
 - Reduce reliance on foreign energy ✓
 - Each gallon of ethanol cuts import needs by 7 gallons
 - Clean up environment ✓
 - Twin Cities in attainment for carbon monoxide

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- September 2004: Governor Pawlenty takes Minnesota to the next level
 - Rolls out plan to make Minnesota the “Saudi Arabia of renewable energy”
 - Move to 20% ethanol content in state gasoline
 - Boost number of E-85 vehicles in state fleet
 - As new chair of Governors’ Ethanol Coalition, advocate for other states to adopt E-10

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- Update: June 30, 2005
 - E-20 bill signed into law in May 2005
 - Five new ethanol, biodiesel plants coming on line in 2005-2006
 - Minnesota poised to implement 2% biodiesel mandate this summer

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Assessing the Competitive Strength
of Ethanol

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- The Competitive Picture
 - Ethanol is a low-cost addition to gasoline
 - Wholesale (rack) price for ethanol averages 8 cents per gallon below 87 octane gasoline
 - Wholesale ethanol averages 11 cents per gallon below 89 octane gasoline
 - E-10 blend costs nearly a cent per gallon less than straight 87 octane gasoline
 - E-85 sells for between 30-60 cents below unleaded

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- Added benefit: More octane for your money
 - The value of gasoline is set according to its octane level – the higher the octane, the higher the pump price
 - Regular gas is 87 octane, “super” is 89 octane, etc.
 - Ethanol has 113 blending octane value
 - 1 gallon of ethanol blended with 9 gallons of 87 octane gas equals 10 gallons of 89 octane gas

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- An example of what this means at the pump:
 - 1 gallon of unblended 89 octane = 78 cents
 - Compare to blended 89 octane:
 - Start with 0.9 gallon of 87 octane = 67.5 cents
 - Mix in 0.1 gallon of ethanol = 6.7 cents
 - Cost of 1 gallon of blended 89 octane = 74.2 cents
 - Ethanol saves blender 5%, or 3.8 cents

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- If ethanol disappeared from the market...
 - Gas prices would jump 14.6% in short term assuming \$2/gallon gas
 - Prices would rise 3.7% in long term even after refiners built new capacity to fill gap left by ethanol
 - Each day, refiners would need to import more than 217,000 barrels of high-octane clean-burning gas blending components

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- The mileage issue
 - Mileage loss from straight gasoline to E-10 is about 2.5%
 - Similar to effect of slightly under-inflated tires
 - Assuming cost savings is passed along from blenders to consumers, both still come out ahead with ethanol blends

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- The energy-balance issue
 - 1 BTU of crude oil required to make 0.8 BTUs of refined gasoline
 - In comparison, that same BTU of energy used for ethanol production yields 1.67 BTUs
 - As farmers and ethanol plants continue to become more efficient, energy balance will also improve

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Key Trends for Ethanol Industry

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- Key trends for Ethanol Industry
 - Increased focus on energy independence
 - America imports petroleum to meet 64% of its needs
 - by 2025, it will be 77%
 - Two-thirds of remaining known oil reserves are located in Middle East
 - Developing economies in China, India consuming greater amounts of petroleum each year

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- Key trends for Ethanol Industry
 - Increased focus on energy independence
 - March 2005: 31 national security experts send letter asking President Bush to take steps to lessen reliance on foreign oil
 - “The United States’ dependence on imported petroleum poses a risk to our homeland security and economic well-being.”
 - “We ask that you launch a major new initiative to curtail U.S. consumption through improved efficiency and . . . deployment of advanced biomass, alcohol and other petroleum fuel alternatives.”

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- Key trends for Ethanol Industry
 - Rising gas prices drive increased consumer interest in alternative fuels
 - Oil prices soaring to \$60 a barrel this week
 - Expectations for continued increase
 - Hybrid, Flex-fuel vehicles increasing popular

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- Key trends for Ethanol Industry
 - Environmental issues remain a priority
 - Concern over greenhouse gas emissions driving renewed focus on emissions controls, mileage standards
 - No new oil refineries have been built in U.S. in 25 years, but 76 new ethanol plants in that time
 - MTBE phase-out

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- Key trends for Ethanol Industry
 - International focus on renewable energy
 - EU: Sets 5.75% biofuels target by 2010
 - Colombia: Requiring 10% ethanol blend in cities by September 2005
 - Thailand: Requiring all gas stations in Bangkok to sell 10% ethanol blends
 - China: Requires ethanol blends in several provinces
 - Argentina: Moving to 5% ethanol in next five years

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- Key trends for Ethanol Industry
 - Congress expected to reach agreement on Renewable Fuels Standard (RFS)
 - “Strong green light for ethanol.”
 - Senate version passed Tuesday requires 8 billion gallons of renewable fuels annually by 2012
 - House version contains 5 billion gallon requirement

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- Key trends for Ethanol Industry
 - Expected RFS benefits include
 - 234,840 new jobs in U.S.
 - \$200 billion added to national GDP between 2005-2012
 - Reduce crude oil imports by 2 billion barrels
 - Reduce outflow of dollars largely to foreign oil producers by \$64 billion

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