Diesel 2.0

Diesel's Clean. Now what?

Leaders in Clean Diesel Technology

Tom Fulks, Diesel Technology Forum
West Coast Representative

Diesel Technology Forum represents the leaders in Clean Diesel Technology

- Amyris
- BASF
- BP
- BorgWarner
- Bosch Diesel Systems
- Caterpillar Inc.
- Corning
- Chrysler
- Cummins Inc
- Daimler
- Delphi Diesel Systems
- Donaldson Co.
- Dow Automotive
- Deere & Company
- Ford Motor Company
- General Motors
- Honeywell
- Johnson Matthey
- Mazda North American Operations
- Navistar
- Volvo/Mack Trucks- Powertrain
- Volkswagen of America

Allied Members

- Association of Diesel Specialists
- Western States Petroleum Association

www.dieselforum.org

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Agenda

- A check on today's reality –
  - The policy & regulatory climate that influences diesel products
- What are they thinking?
  - Selected results from new DTF public opinion survey

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"Heard about the new kids in town?"

- November election results: A new breed of new policymaker on the job – *96 new members of Congress (86 House, 10 Senate) & 26 new governors now have seven months on the job.*
- *Key 2010 campaign issues were*
  - *Economy / Jobs / Debt Ceiling*
- *Key 2011 governing issues are*
  - *Cut / Cut / Cut / Debt Ceiling*
- *Economy / Jobs … waiting for attention*

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The new kids are troublemakers

- They oppose Administration on incentivizing alternative fuels, batteries, wind, solar, etc., and ignore and/or move away from petroleum
- Some support proposed cuts to important diesel engine efficiency and truck research at DOE
- Some support, some oppose proposed termination of the Diesel Emissions Reduction Act (down to $30 million in FY 2012)
- *Our challenge: Keeping clean diesel part of the clean economy conversation*

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California pushes envelope

- New CARB requirements challenging diesel's ability to play in future passenger car lineups.
- Proposed LEV III criteria emissions and GHG emissions regulation calls for SULEV compliance in all passenger vehicles beginning with 2017 MY.
- Most diesel OEMs will struggle with SULEV NOx compliance, but none have openly opposed proposed 50 milligram/mile fleet average.
- Draft rule language due out Sept. 28; CARB decision scheduled late November.

California pushes envelope (cont.)

- Low Carbon Fuel Standard: 10% carbon content reduction by 2020, with more reductions later
- Some 90-100 biofuel pathways approved to date, mostly ethanol but some biodiesel & renewable diesel
- CARB's biodiesel emissions study results show "statistically significant" increases in NOx from FAME biodiesel, but NOx improvements from non-ester renewable diesel
- FAME impact on diesel LEV III NOx compliance a concern

Policy Updates

Do New kids want fuel-efficient vehicles?

- **Light Duty Cars – US EPA / NHTSA Fuel economy standards just issued; CA in agreement**
  - Landmark fleet average fuel economy requirements proposed July 29.
  - Requires 5% a year improvement in FE (3.5% for light trucks initially, then at 5%) each year 2017-2025 to the 54.5 mpg standard.
  - Reality check in 2021; flexibility for trucks and SUVs .. Devil is in the details
- **Medium-Heavy duty trucks** -- First-ever rules on fuel economy for medium and heavy-duty trucks… coming soon.

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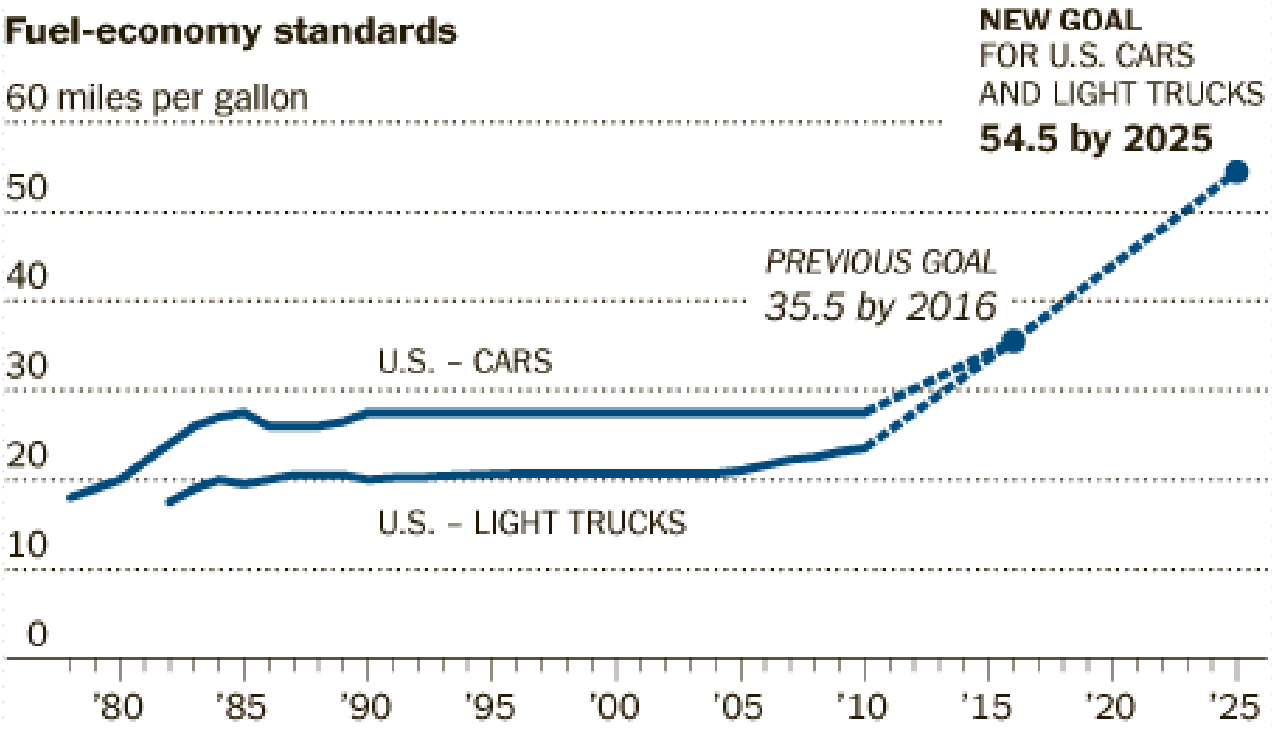
New Fuel Economy standards

Setting a New Goal for Fuel Economy

After months of talks with Washington, automakers have agreed to a new goal for fuel economy — 54.5 m.p.g. for all U.S. cars and light trucks by model year 2025.



Source: National Highway Traffic Safety Administration

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What does this mean for diesels?

- A far more crowded field of vehicle and technology choices (PEV, HEV, E85, diesels, Gasoline DI) coming.
- More diesels coming to US market
  - Audi
  - BMW
  - Daimler
  - Chevy Cruze (2013)
  - Mazda SKY-D (2013)
  - Half-ton pickups? (Press rumors)
- Expanded use of bio and 2nd-generation diesel fuels

Attitudes and Perceptions on Diesel

DTF commissioned research – selected results

DTF opinion research

- Asked 300+ policymakers and opinion leaders about …
  - The "clean energy" economy
  - Diesel and clean diesel relative to other transportation fuels and technologies

- *Policymakers = elected officials, congressional staff*
- *Opinion leaders = newspaper columnists, trade associations, think tanks, NGOs*
- *Online survey, late 2010*

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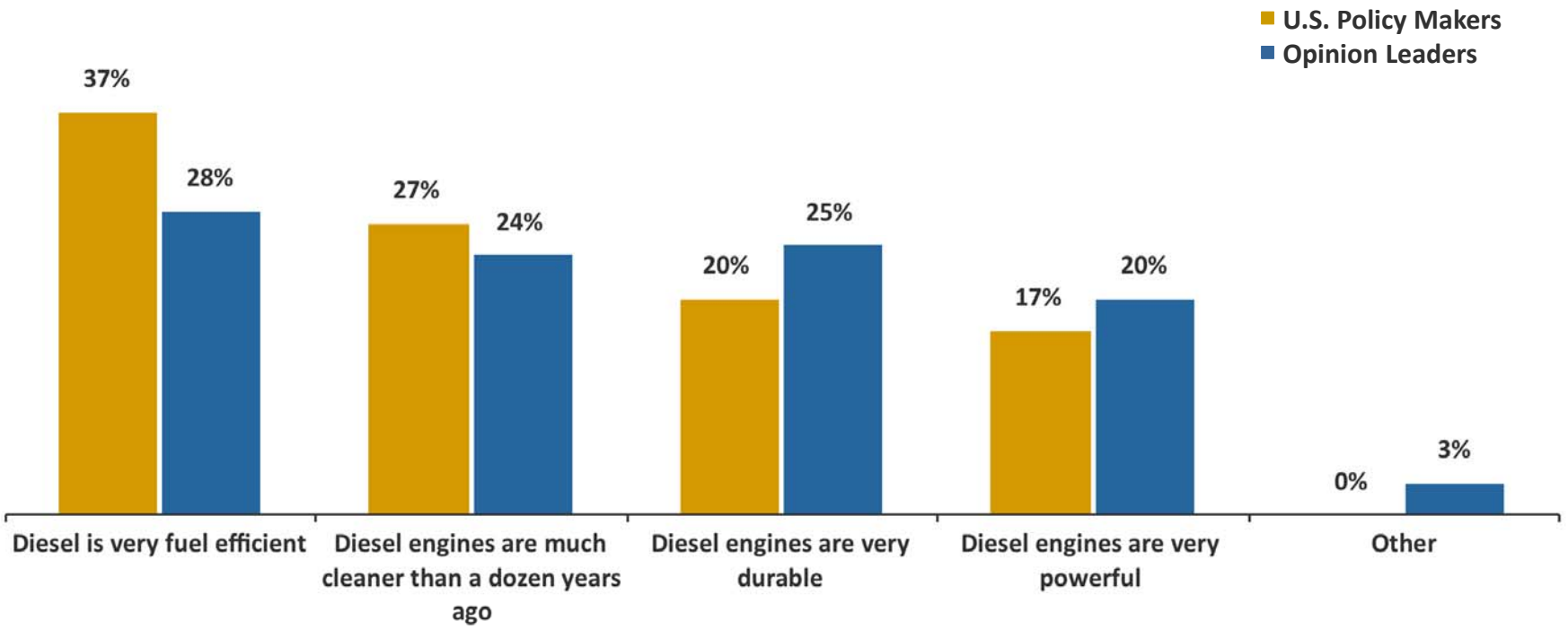
Most Important Positive of Diesel Power

- On an aided basis, diesel is recognized as having many positive traits, but there is no clear overwhelming positive characteristic: each characteristic tested garners roughly 20% of mentions.
- Policy Makers, in particular, note diesel's fuel efficiency.

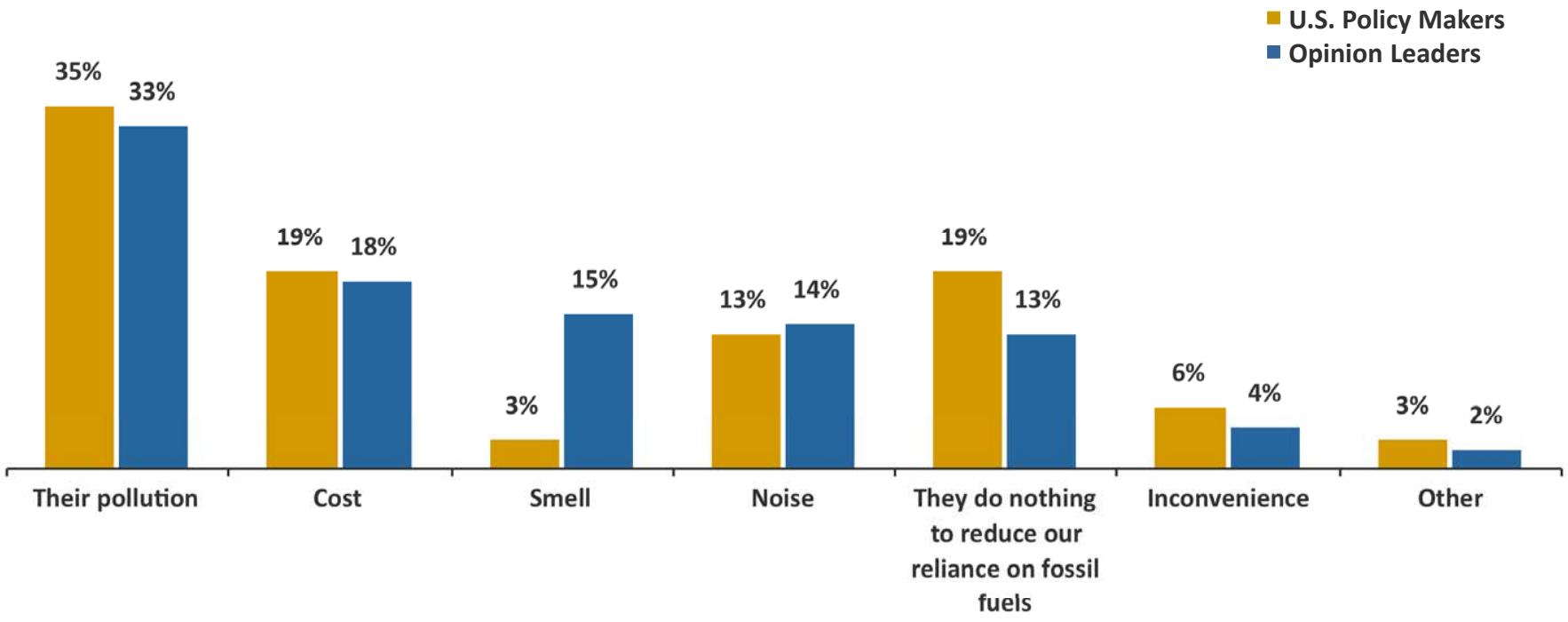


Base: U.S. Policy Makers (N=31), Opinion Leaders (N=274)

Q13. Which of the following do you think is the most important positive characteristic of diesel power?

Most Significant Negative of Diesel Power

- Respondents hone in on "pollution" as the most significant negative of diesel power. Pollution is cited by a margin of at least 2:1 more frequently than "cost," "smell," "noise," or "inconvenience."
- Nearly one in five (19%) of Policy Makers and 13% of Opinion Leaders cite "does nothing to reduce our reliance on fossil fuels" as the most important negative of diesel power.

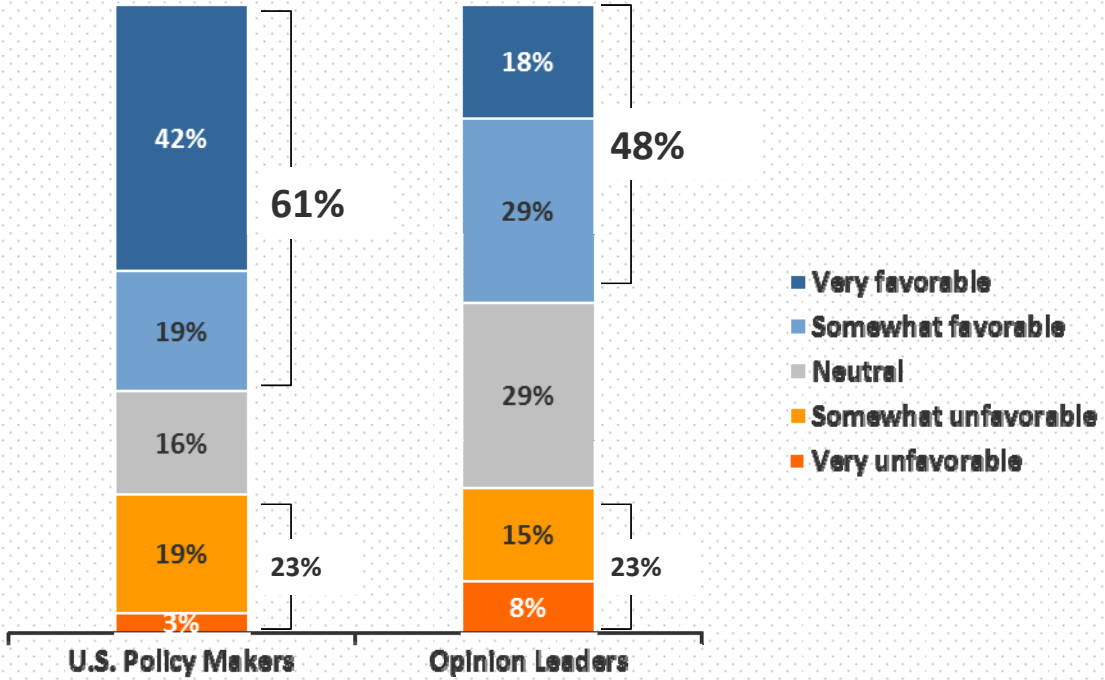


Base: U.S. Policy Makers (N=31), Opinion leaders (N=274)

Q14. And which of the following is the worst characteristic of diesel engines and fuel?

Impressions of Diesel Power

- Overall impressions of diesel power are relatively positive with 61% of Policy Makers and nearly half (48%) of Opinion Leaders saying they are "somewhat" or "very" favorable toward diesel power.
- Among Policy Makers, favorability is not only greater but also more solid (42% "very favorable).

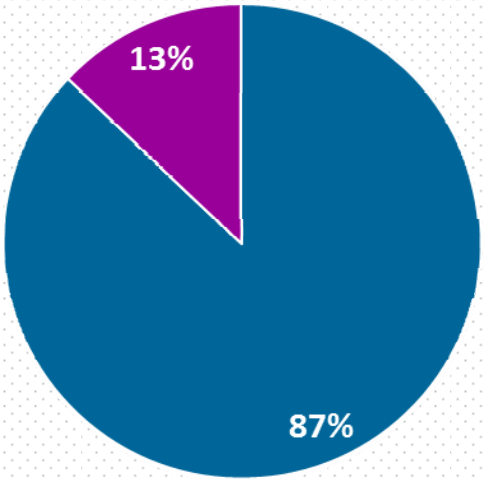


Base: U.S. Policy Makers (N=31), Opinion Leaders (N=274)
Q11.Overall, what is your impression of diesel power?

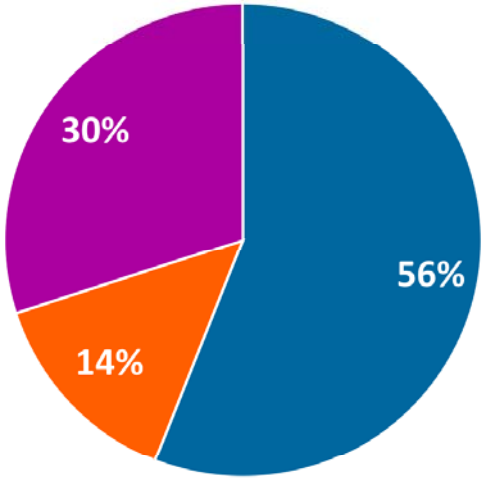
Majority of opinion leaders/policymakers recognize diesel has gotten better during past 5 years

- By a large margin, in terms of environmental considerations, diesel is thought to have gotten better.
- This is most notably true among Policy Makers, but also holds true among Opinion Leaders.

U.S. Policy Makers



Opinion Leaders



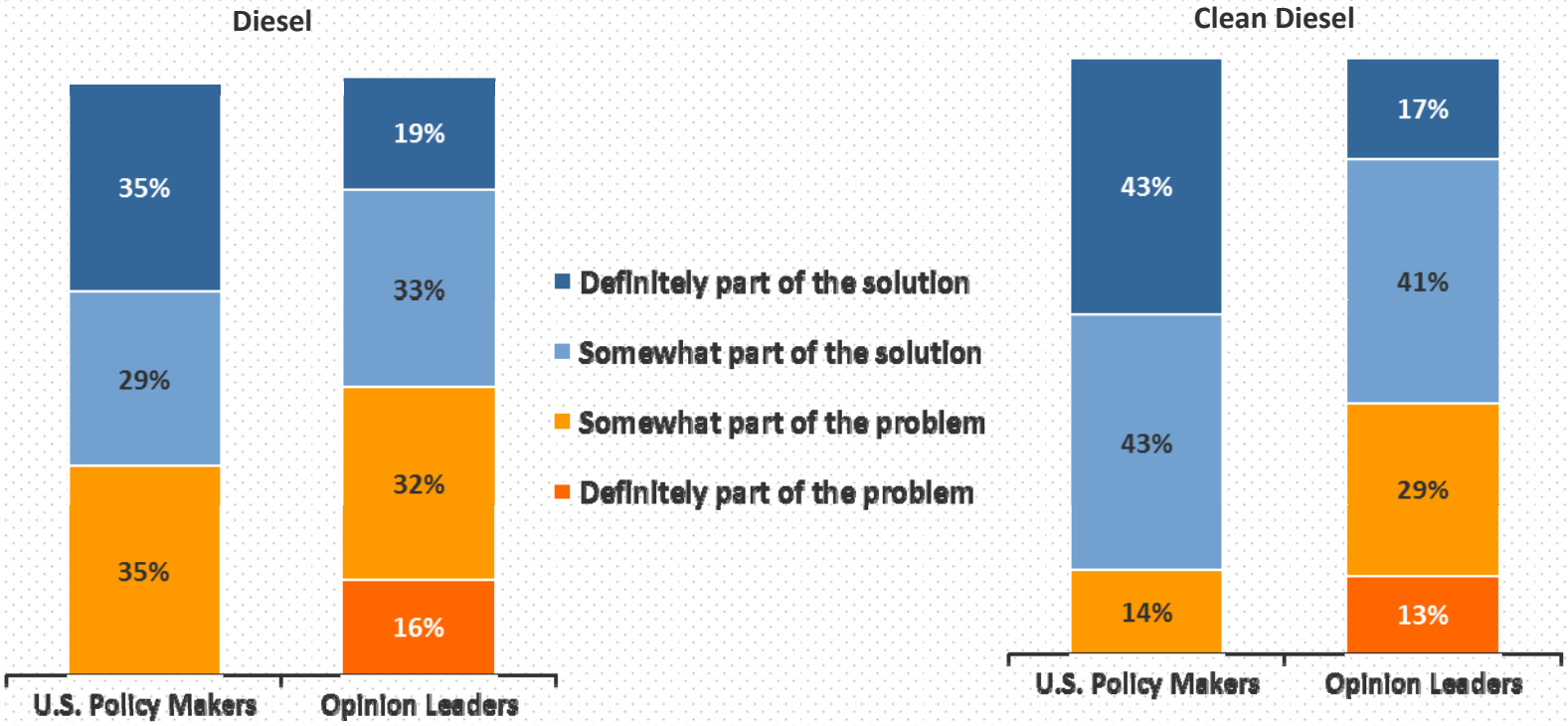
Gotten better
Gotten worse
Stayed the same

Base: U.S. Policy Makers (N=31), Opinion Leaders (N=274)

Q30. Thinking about environmental considerations, would you say that diesel has gotten better, gotten worse, or stayed the same over the last five years?

Diesel/Clean Diesel: Problem or solution?

- **Diesel** – regardless of whether it carries the "clean" modifier – is seen as more part of the solution than a part of the problem to America's energy needs.
- Among Policy Makers in particular, inclusion of the "clean" modifier is more positive and persuasive.



Base: U.S. Policy Makers (N=17), Opinion Leaders (N=127)
Q29A. Thinking of diesel relative to some of the main issues facing America's energy needs, do you consider diesel to be part of the problem or part of the solution?
Base: U.S. Policy Makers (N=14), Opinion Leaders (N=147)
Q29B. Thinking of clean diesel relative to some of the main issues facing America's energy needs, do you consider clean diesel and new diesel technologies to be part of the problem or part of the solution?

Top 10 Lists:
Highest numbers of **registered diesel**…

Cars

1.	California	54,305
2.	Texas	36,380
3.	Florida	29,292
4.	Pennsylvania	23,085
5.	New York	21,377
6.	Washington	19,481
7.	North Carolina	18,763
8.	Virginia	17,571
9.	New Jersey	16,652
10.	Illinois	16,082

National Total **492,318**

Source: R.L. Polk & Co.

Pickup Trucks:

1.	Texas	643,660
2.	California	454,478
3.	Florida	208,348
4.	Washington	172,928
5.	Colorado	153,186
6.	Oregon	146,760
7.	North Carolina	133,998
8.	Arizona	131,703
9.	Georgia	126,216
10.	Michigan	124,419
11.	Ohio	124,384,
12.	Missouri	124,352

National Total **4,995,360**

Diesel's clean – Now what?

- Yesterday – Was all about emissions
- Today – It's all about energy, efficiency, Low Carbon Fuels, carbon footprint
- Economics of ownership and operation
  - Initial cost – premiums
  - Maintenance
  - Fuel costs
  - Resale values

DIESEL TECHNOLOGY FORUM

Thank you – The End

www.dieselforum.org

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