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# **EPA's Biofuels Efforts and E85**

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# Introduction

- Why is EPA interested in biofuels?
    - Many biofuels have significant environmental benefits
      - Reductions in certain criteria and toxics emissions
      - Reductions in greenhouse gas emissions
      - Potential for even greater benefits as cellulosic ethanol and other technologies are developed
    - Energy security
    - Economic opportunities
  
  - EPA is working on a number of biofuels efforts:
    1. Regulatory activities
    2. Analytical & outreach efforts
    3. Voluntary partnerships
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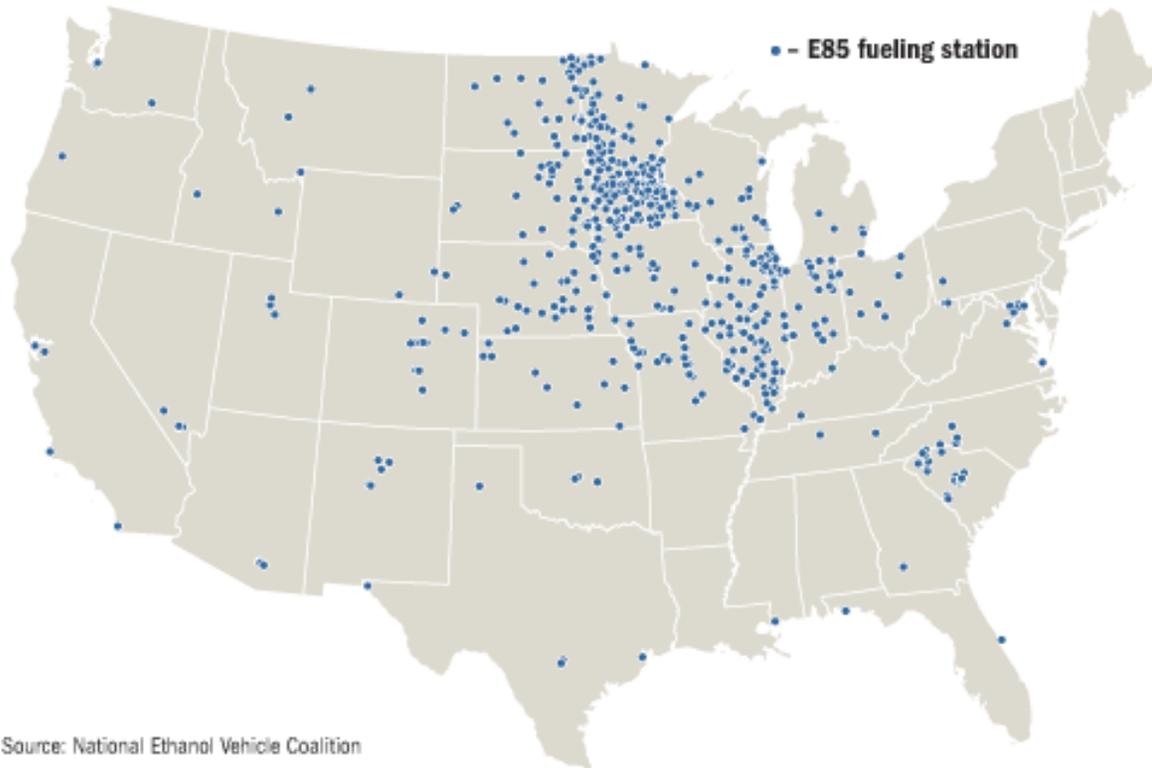
# Background on E85

- E85 is a blend of 85% renewable ethanol and 15% gasoline
  - Vehicles must be “flexible fuel” capable to use E85
    - Over 5 million flex-fueled vehicles (FFVs) are currently on the road
    - **But, prior to this year, only about 1% of FFVs were fueled with E85...**
  - Limited E85 fueling over the past several years can be attributed to:
    - Lack of awareness
      - Many FFV drivers are not aware that their vehicle can run on E85
      - Lack of awareness among the general public regarding E85’s environmental and energy security benefits
    - Lack of infrastructure
      - Only 800 out of approximately 170,000 gas stations in the US offer E85
      - Most of these are independent stations concentrated in the Midwest
    - Lack of an economic incentive
      - Because of E85’s reduced fuel economy, it must be priced significantly lower than gasoline (15-25% to break even)
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# Map of E85 Stations

## Fueling Up With Ethanol

More than 600 gasoline stations in the U.S. now also sell the ethanol mix known as E85. Most are concentrated in the Midwest.



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# FFVs and E85—A Growth Industry

- In July, the three major domestic automakers sent a letter to Congress promising to double their annual production of alternative-fuel vehicles to 2 million by 2010.
  - The number of E85 pumps is also growing
    - Upwards of 200 new pumps built in the last year
  - Several states have their own E85 incentives, including rebates, sales tax breaks, etc
    - The # of E85 pumps in IL alone grew from 18-123 in one year
  - A majority of the recent energy bills introduced in Congress include E85/FFV mandates and/or incentives
  - OTAQ is receiving growing inquiries from many stakeholders about E85 fuel quality, FFV technology, fueling pumps, etc
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# 1. EPA's Regulatory Activities

EPA has several regulatory responsibilities regarding biofuels:

- Renewable Fuel Standard (RFS)
    - The RFS, part of the Energy Policy Act of 2005, requires EPA to develop a program to double renewable fuel use by 2012
    - The NPRM was recently announced, and EPA is now working on the final rule
    - Within this process, we are also analyzing the impacts of increased renewable fuel use
  - Fuel Quality
    - Through guidance and fuel registration, EPA ensures that biofuels do not adversely affect emissions performance
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# E85 Fuel Specification

- EPA currently has no fuel specs for E85
  - How is E85 regulated in our fuels programs?
    - E85 is not covered under EPA's fuel and fuel additive registration program (CAA 211(a)) (Only gasoline and diesel fuel have been designated by the Administrator under the registration program.)
    - E85 as a finished blend is not gasoline, and not subject to our gasoline regulations (40 CFR Parts 79 & 80).
    - E85 as a finished blend is subject to "sub-sim"
      - CAA 211(f) requires fuel manufacturers to produce fuels that are substantially similar ("sub-sim") to fuels used for vehicle certification
  - Since we're anticipating expanded E85 use, it's appropriate to ensure E85 fuel quality
    - We're considering ways to clarify E85 fuel requirements
    - Auto manufacturers very supportive of E85 fuel specs
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# EPA's Regulatory Activities (cont')

- Alternative Fuel Vehicle Certification
    - Alt fuel vehicles, including Flex Fuel Vehicles (FFVs), are certified for emissions compliance
    - E85 and biodiesel conversion kits are also currently being considered for certification
  - Resolving regulatory issues
    - e.g. Stage II Vapor Recovery
    - The CAA requires Stage II Vapor Recovery on fuel pumps located in ozone non-attainment areas
      - However, there are no certified E85 pumps
    - Currently evaluating whether Stage II vapor recovery is needed for E85 pumps
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## 2. EPA's Analytical & Public Information Efforts

- Lifecycle modeling
  - Public education
    - “Sharing the environmental story of biofuels”
    - OTAQ Alternative Fuels webpage
    - Updating E85 and biodiesel fact sheets
  - Emissions Analysis
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# E85 Emissions Analysis

- We've investigated existing data to better understand the potential benefits of E85
    - Assessed per-vehicle emissions impacts of gasoline (E0) vs. E85
  - Auto manufacturers (GM, Ford, DCX) have been very cooperative and supplied limited data
  - We've identified a few regulatory gaps & areas for further data collection
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# Emissions Impacts of E85 (vs E0)

## ■ **Criteria emissions**

- Generally similar to gasoline emissions
- But, significant reductions in carbon monoxide
- Preliminary data indicates NO<sub>x</sub> emissions from E85 may be lower than E0 or E10

## ■ **Toxics**

- Significant reductions in benzene and other harmful air toxics
  - Acetaldehyde emissions increase
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# Emissions Impacts of E85 (cont)

- **Greenhouse Gases (GHGs)**

- E85 made from corn: 15-20% reductions compared to gasoline
- E85 made from cellulose: About 70% reduction compared to gasoline

- **Areas planned for further study**

- Cold start NMOG emissions
  - Emissions performance under different test cycles
  - E85-E10 comparison
  - Direct and secondary PM
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# Fuel Economy

- Fuel economy on E85 is typically ~25% lower than on gasoline
  - Due to lower energy density of E85
    - ~29% lower than gasoline
    - 82,000 Btu/gal (E85) vs. 115,000 Btu/gal (Gasoline)
  - So consumers using E85 will experience decreased driving range between fill-ups
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## 3. EPA's Voluntary Partnerships

- SmartWay Transport Partnership—
    - Over 400 fleet partners
    - Many interested in selling biofuels, and/or using them in their fleets— tremendous demand source for biofuels
    - Biodiesel is already a verified strategy for fleets' SmartWay commitments, and we are looking at including E85
  - National Clean Diesel Campaign
    - Regional public-private partnerships focused on reducing emissions from the transportation sector
      - West Coast Clean Diesel Collaborative, Blue Skyways Collaborative, Southeast Diesel Collaborative, etc
    - These collaboratives are working to bring about greater access to biodiesel and E85 along key transportation corridors.
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