BIOFUELS & PUBLIC HEALTH (IMPROVING THE AIR WE BREATHE)

ANGELA TIN
EMERGING ISSUES FORUM
APRIL 2016
HISTORY

- 1904 (oldest voluntary health organization)
  - National Tuberculosis Association
  - Christmas Seals
- 1906 - Lorraine Cross
  - Crusaders
  - French Cross of Lorraine
  - Crusade against the White Plague
LUNG CANCER IS THE DEADLIEST CANCER

Estimated Cancer Deaths by Site, 2013

- Lung Cancer
- Colon
- Breast
- Pancreas
- Prostate

Source: American Cancer Society. Cancer Facts & Figures 2013

MOST LUNG CANCER IS CAUSED BY SMOKING (WHILE THE NUMBER OF SMOKERS ARE DECREASING, THE INCIDENCE OF LUNG CANCER IS INCREASING)
EARLY DETECTION FOR LUNG CANCER RESEARCH GRANTS 
EDUCATION & ADVOCACY PREVENTION PROGRAMS

Targeting Research:
- Early detection methods
- Screening tests
- Treatment methods
- A clear foundation for future development.
- Builds on ongoing research on treating and finding a cure
WHERE DOES OZONE COME FROM?

Primordial Ozone Soup

HOW VOCs AND NOx FORM GROUNDLEVEL OZONE

$\text{NOx + VOC = Ozone}$

$\text{VOC + NOx + SUNLIGHT = OZONE}$
U.S. NOX EMISSIONS BY SECTOR

- Mobile: 62%
- Fuel Combustion: 26%
- Industrial Processes: 9%
- Fires: 3%
- Miscellaneous: <1%
PARTICULATE MATTER

- PM 10 – PM 2.5 micron
- Natural & industrial
- Health effects
  - Bronchioles 1-5 m
  - Lung & heart
- Environmental effects
  - Haze & smog
  - Water acidity
  - Damage to crops
  - Effects on ecosystems
U.S. HYDROCARBONS EMISSIONS BY SECTOR

- Mobile: 26%
- Industrial Processes: 19%
- Consumer/Commercial Solvent Use: 16%
- Miscellaneous: 7%
- Fuel Combustion: 3%
- Fires: 29%
CLIMATE CHANGE & GREENHOUSE GASES

- Carbon dioxide – burning of fossil fuels (coal, natural gas, and petroleum fuels)
- Result of chemical reactions (mfg of cement)
- Usually removed by plants as a part of biological carbon cycle (except when there is an excess)
2013 NEBRASKA AIRSHED EMISSIONS

- Mobile, 28.2%
- Agriculture, 21.0%
- Biogenics, 17.1%
- Fuel_Combustion, 18.0%
- Dust, 6.6%
- Industrial_Processes, 6.4%
- Solvent, 2.1%
- Miscellaneous, 0.6%
CLEAN AIR ACT (1970)

- Created EPA
- EPA required to establish air quality standards (NAAQS)
  - 6 Criteria pollutants (ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead)
  - Toxic air pollutants (carcinogens)
- Time lines to comply (which is now)
- Will tighten standards (which is now)
- Will add more pollutants later (which is now)
What is a “nonattainment” (NA) area?

- An area that does not meet (or upwind from an area that does not meet) the air quality standard for that pollutant
- 6 pollutants
- 6 reasons & more
- 118 non-attainment areas in U.S.
THE CLEAN AIR ACT PREVENTS

<table>
<thead>
<tr>
<th>Category</th>
<th>2010</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Mortality - particles</td>
<td>160,000</td>
<td>230,000</td>
</tr>
<tr>
<td>Infant Mortality - particles</td>
<td>230</td>
<td>280</td>
</tr>
<tr>
<td>Mortality - ozone</td>
<td>4,300</td>
<td>7,100</td>
</tr>
<tr>
<td>Chronic Bronchitis</td>
<td>54,000</td>
<td>75,000</td>
</tr>
<tr>
<td>Heart Disease – Acute Myocardial Infarction</td>
<td>130,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Asthma Exacerbation</td>
<td>1,700,000</td>
<td>2,400,000</td>
</tr>
<tr>
<td>Emergency Room Visits</td>
<td>86,000</td>
<td>120,000</td>
</tr>
<tr>
<td>School Loss Days</td>
<td>3,200,000</td>
<td>5,400,000</td>
</tr>
<tr>
<td>Lost Work Days</td>
<td>13,000,000</td>
<td>17,000,000</td>
</tr>
</tbody>
</table>
WHO MUST COMPLY?
- Mobile Sources
  - On road
  - Off road
  - Planes
  - Trains
  - Small engines
- Chemical Products
NOT HOMES OR PEOPLE (DIRECTLY)!

No federal laws mandating:
Recycling, reuse, energy, chemical, vehicle choice or fuel usage
CLEAN AIR ACT PROGRESS

- Gross Domestic Product
- Vehicle Miles Traveled
- Population
- Energy Consumption
- CO₂ Emissions
- Aggregate Emissions (Six Common Pollutants)
TRANSPORTATION ENERGY USE BY MODE AND FUEL TYPE

- Gasoline
- Diesel fuel
- Liquefied petroleum gas
- Jet fuel
- Residual fuel oil
- Natural gas
- Natural gas
- Electricity

Billion GGEs Per Year

Light vehicles
Medium/heavy trucks and buses
Air
Water
Pipeline
Rail

Mode of Transportation
MOBILE SOURCE EMISSIONS

- Exhaust emissions
- Evaporative emissions (hot days > cold days)

- Trip emissions (average trip = 7 miles X 7 times day)
  - Variable emissions - speed
  - Variable emissions - age

- Refueling emissions
MOBILE SOURCE CLEAN AIR RULES

- Clean Cars and Passenger Trucks – Tier 3
- Clean Heavy-Duty Trucks and Buses
- Mobile Source Air Toxics Rule
- Clean Non-road Diesel Engines and Equipment
- Locomotive and Marine Diesel Standards
- Ocean-going Vessels
- Small Gasoline and Recreational Marine Standards
- Ultra-low Sulfur Fuel Requirements
- Renewable Fuel Standards
## Nebraska Data

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Population</td>
<td>1,855,525</td>
</tr>
<tr>
<td>Pediatric asthma</td>
<td>32,091</td>
</tr>
<tr>
<td>Adult asthma</td>
<td>103,000</td>
</tr>
<tr>
<td>COPD</td>
<td>74,128</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>1,111</td>
</tr>
</tbody>
</table>

### Air Pollution Sources

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Mobile Sources</th>
<th>Fuel Combustion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>72%</td>
<td></td>
</tr>
<tr>
<td>Nitrogen Oxides</td>
<td>61%</td>
<td>17%</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td></td>
<td>96%</td>
</tr>
<tr>
<td>Lead</td>
<td>51%</td>
<td>36%</td>
</tr>
</tbody>
</table>

*Note: Percentages represent the proportion of emissions from each source.*
CLEAN AIR CHOICE™

- Ethanol Fuel
- Biodiesel
- Clean Diesel
- Electric Vehicles
PROGRAM EFFORTS

1. Interactive Event Display
2. IL E85 Coupon Program
3. FFV Dealership Coupon
4. Online Coupon Program
5. Enterprise Coupon Program
6. GIS Station Mapping
7. Infrastructure Grants
8. Environmental & Health Benefits

Illinois
Indiana
Iowa
Minnesota
Nebraska
Ohio
Wisconsin
INFRASTRUCTURE GRANT PROGRAM

Illinois E85 Station Grants
Funding available for:
New Station Construction & Existing Station Conversion
Ask Us For Application Details

Grant Funded Projects
## 2016 USDA Biofuels Infrastructure Grants

<table>
<thead>
<tr>
<th>State</th>
<th>Dollar AMT</th>
<th>Stations</th>
<th>Pumps</th>
<th>Tanks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>12 M</td>
<td>65</td>
<td>428</td>
<td>54</td>
</tr>
<tr>
<td>Indiana</td>
<td>895 K</td>
<td>110</td>
<td>110</td>
<td>0</td>
</tr>
<tr>
<td>Iowa</td>
<td>5 M</td>
<td>100</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>Kansas</td>
<td>1.3 M</td>
<td>170</td>
<td>174</td>
<td>0</td>
</tr>
<tr>
<td>Michigan</td>
<td>3 M</td>
<td>16</td>
<td>89</td>
<td>20</td>
</tr>
<tr>
<td>Minnesota</td>
<td>8 M</td>
<td>165</td>
<td>620</td>
<td>92</td>
</tr>
<tr>
<td>Missouri</td>
<td>2.8 M</td>
<td>166</td>
<td>171</td>
<td>41</td>
</tr>
<tr>
<td>Nebraska</td>
<td>2.3 M</td>
<td>32</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>North Dakota / South Dakota</td>
<td>3.7 M</td>
<td>46</td>
<td>164</td>
<td>12</td>
</tr>
<tr>
<td>Ohio</td>
<td>3.4 M</td>
<td>41</td>
<td>148</td>
<td>4</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>3.7 M</td>
<td>100</td>
<td>120</td>
<td>100</td>
</tr>
</tbody>
</table>
REFORMULATED GAS SUBSTANTIALLY REDUCES HARMFUL GASOLINE EMISSIONS

<table>
<thead>
<tr>
<th>The Health Benefits of Ethanol: C. Boyden Gray</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Toxics</strong></td>
</tr>
<tr>
<td><strong>Volatile Organic Compounds</strong></td>
</tr>
<tr>
<td><strong>Nitrogen Oxides</strong></td>
</tr>
<tr>
<td><strong>Carbon Monoxide</strong></td>
</tr>
<tr>
<td><strong>Sulfur Oxides</strong></td>
</tr>
<tr>
<td><strong>Carbon Dioxide (Green House)</strong></td>
</tr>
<tr>
<td><strong>Particulate Matter</strong></td>
</tr>
<tr>
<td><strong>Reduced Cancer Risk</strong></td>
</tr>
</tbody>
</table>
NEBRASKA CO2 EMISSION REDUCTIONS

- 83 stations selling E85 (6% of the total active stations in Nebraska)
- 8,419 tons of CO2 emissions reductions per year (less 1,600 cars off the road each year)
- If 30% of stations sell E85, emissions reductions increase to over 42,000 tons per year.

1,116,531 cars in NE
Reformulated Gas in 1995

51% Decrease in Ozone

31% Decrease in Carbon Monoxide

Continuous monitoring at 80 monitoring sites with more than 200 instruments
With the removal of lead from gasoline, there is almost no lead in either the air or water.
PRESENTATIONS AND PROJECTS
ENVIRONMENTAL & HEALTH BENEFITS

• Comments on Proposed RFS
• E15 Proposal in Chicago
• State Corn Board Partner Meetings
• U.S. Car (AAE) Annual Meetings
• U.S. Grains Meeting in Amsterdam
• U.S. Grains Meeting in China
• USDA Meeting in Taiwan
• Infrastructure Grants in Illinois/Ohio/Indiana
• Outreach Campaign in Nebraska/Iowa/Indiana
• USDA Grant Opportunity for Infrastructure
WHY WE ARE INVOLVED?

- To work in area of most harm (mobile sources)
- To reduce air emissions & promote good lung health
- Ethanol blended fuel
  - Renewable – sustainable fuel
  - Non toxic, water soluble & biodegradable (all media)
  - Positive environmental benefits
  - No environmental harm from accidental releases
  - No environmental harm compared to oil exploration or natural gas drilling
SUMMARY

• The Clean Air Act has been successful in dramatically reducing air pollution in the United States.
• Reduction in pollution from all types of motor vehicles has been critical to meeting air quality goals.
• Regulation of motor vehicle fuels at the national level, combined with local fuel requirements, has brought many areas to within health-based air quality standards.
• Use of oxygenates in fuels, primarily ethanol, has been an important component of fuels programs in the U.S.
• Ethanol will provide a strong role in national fuels programs in the future, including efforts to address GHG emissions.
https://www.youtube.com/watch?v=o_-CIAjTInQ
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Vice President  
Environmental Health  
American Lung Association of the Upper Midwest  
Angela.Tin@Lung.org  
217.787.5864

* [www.CleanAirChoice.org](http://www.CleanAirChoice.org) *  
[www.E85Coupon.com](http://www.E85Coupon.com) *