Reducing Black Carbon Emissions from Heavy-duty Diesel Vehicles and Engines

RESULTS TO DATE AND STRATEGY FOR CONTINUED SUCCESS
Topics

• Initiative overview
• Project highlights
  o A global action plan for Green Freight
  o Global clean ports
  o Progress towards marine BC control
  o Commitments to soot-free bus fleets
  o East Africa desulfurizes its fuels
• Spotlight: Global Sulfur Strategy

http://ccacoalition.org/en/content/global-sulfur-strategy
Overview: Why focus on diesel vehicles and engines

Diesel BC measures among 16 win-win strategies to address SLCPs

Diesel BC measures among 16 total measures to reduce radiative forcing from short-lived substances

1. Diesel particulate filters as part of a Euro 6/VI package for road and off-road diesel vehicles
2. Elimination of high-emitting vehicles in on-road and off-road transport

Overview: Why focus on diesel vehicles and engines

Diesel engines are a key target for health reasons.

“The scientific evidence was compelling and the Working Group’s conclusion was unanimous: diesel engine exhaust causes lung cancer in humans.”

-Dr. Christopher Portier

Overview: Why focus on diesel vehicles and engines

Stages of Black Carbon Emissions Control Based on European Regulatory Approach to heavy-duty diesel engines
Overview: Why focus on diesel vehicles and engines

Deployment of low sulfur fuels needs to be accelerated
Overview: Why focus on diesel vehicles and engines

More stringent standards for diesel fuel and vehicles would reduce cumulative emissions of diesel BC by an estimated 7.1 million metric tons through the year 2050, or by over 85% throughout developing regions by 2050.

<table>
<thead>
<tr>
<th>Accelerated desulfurization scenario</th>
<th>2020</th>
<th>2030</th>
<th>2050</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Black Carbon Reduction</td>
<td>Net climate benefit</td>
<td>Black Carbon Reduction</td>
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<td>.02 (.04)</td>
<td>16 (30)</td>
<td>.17 (1.0)</td>
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Annual (and cumulative) reductions in black carbon emissions (millions of metric tons) and net climate benefit (millions of metric tons CO$_2$ equivalent, based on GWP-100) through low sulfur diesel and emission standards
Overview: What the Diesel Initiative does

**Diesel Initiative**
Reduce Black Carbon emissions from diesel engines and vehicles

**Low sulfur fuel standards**
Support adoption of low sulfur diesel fuel standards

**National emission standards**
Support adoption of advanced emissions standards

**Focus areas**
Targeted efforts in key high emissions sectors

**LEAD PARTNERS:** Canada, Switzerland, United States, ICCT and UNEP

**IMPLEMENTERS:** UNEP and ICCT

Overview: Where we work

- **Targeted national and regional support on clean fuel and vehicle standards**
  Mexico, China, Indonesia, East Africa, Western and Southern Africa, and Latin America

- **Global efforts**
  Global Sulfur Strategy, Global Green Freight Action Plan, Global Strategy for Ports and Maritime Vessels

- **Targeted support on the ports’ project**
  Bangladesh (Port of Chittagong), Chile (Port of Valparaíso), Ghana (Port of Tema), Jordan (Port of Aqaba)

- **Targeted support on Green Freight Strategy**
  Bangladesh, Mexico, Vietnam

- **Targeted action on soot free bus fleets in 20 cities**
Overview: The Diesel Initiative in numbers

**Outputs**
- 21 political outreach events
- 21 media coverage events
- 11 knowledge resources and tools

**Outcomes**
- 154 strengthened institutions
- 5 laws and regulations
- 10 policies and plans
- 2 changes in technologies and practices
- 58 commitments

**Potential impact**
- Global Sulfur Strategy in 2030:
  - 1 MMT BC / 780 MMT CO2e GWP100 cumulative
  - 100,000 fewer deaths per year
- Ports/Marine Strategy in 2030:
  - 0.15 MMT BC / 8 MMT CO2e GWP 100 cumulative
Highlight: Over 50 organizations and countries have pledged their support to the Global Green Freight Action Plan

Action Plan Available at: http://www.globalgreenfreight.org/
Highlight: **Soot-free bus fleets**

**Committed**
Not Committed as of July 2016
Highlight: Building global consensus on definition, measurement and control of marine BC
Highlight: Global Clean Ports initiative

By January 2015, Burundi, Kenya, Rwanda, Tanzania and Uganda completed their transition to low sulfur 50-ppm diesel fuel for cars, trucks and buses.
Spotlight:

Global Strategy to Introduce Low-Sulfur Fuels and Cleaner Diesel Vehicles

Strategy Available at: http://ccacoalition.org/en/content/global-sulfur-strategy/
What: Objectives & targets

To significantly improve health and reduce SLCP by reducing PM/BC emissions from the global HDD fleet through the introduction of low sulfur fuels and advanced vehicles standards for heavy duty vehicles.
How: Markets & refineries

Oil and fuel flows worldwide; opportunities to support shifts in markets
Refineries

Refinery upgrade cost differs in all regions – opportunities for investment
Four categories of strategic action in countries

1. **Importers** buy fuels on the open market and have not switched to buying low-sulfur fuels.
2. **Refiners** produce high sulfur fuel and must make new investments to produce low sulfur fuels.
3. **Vehicle Standards** are countries that already consume low sulfur fuels but do not require cleaner vehicles to lower emissions.
4. **City First** consume low sulfur fuels in urban areas but do not require cleaner vehicles to lower emissions.
<table>
<thead>
<tr>
<th>Region</th>
<th>Category 1: Importers</th>
<th>Category 2: Refiners</th>
<th>Category 3: Vehicle Standards</th>
<th>Category 4: City First</th>
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<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>Ethiopia</td>
<td>Cote d'Ivoire</td>
<td>East Africa region: Kenya, Uganda, Tanzania, Rwanda and Burundi</td>
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<td>Mozambique</td>
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<td>Latin America &amp; the Caribbean</td>
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<td>Bahrain</td>
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Benefits: 500,000 early deaths avoided in 2050

Figure 1.6. Urban health benefits of on-road fuel desulfurization in countries considered across Africa, Asia-Pacific, Latin America, and Middle East

Source: ICCT estimates
Implementing the strategy

Implementing the HDDI Global Strategy for Low Sulfur Fuels and Clean Diesel Vehicles

Component 1. Desulfurize Imports
   1.1. Establish a Technical Facility on Fuel Import Desulfurization Lead: UNEP (Canada, Facilitation Support)
   1.2. National, Sub-regional and Regional Support for Importers Lead: UNEP

Component 2. Desulfurize Refineries
   2.1. Establish a Technical Facility on Refinery Desulfurization Lead: UNEP (with U.S. facilitating support)
   2.2. National, Sub-regional and Regional Support on Refinery Desulfurization Lead: UNEP

Component 3. Soot-Free Vehicles and Engines
   3.1. Technical Support Facility to Members of the Soot-Free Vehicles and Engines Working Group Lead: ICCT (Swiss Facilitation Support)
   3.2. National and Sub-regional Policy Support for Soot-Free Vehicles and Engines Lead: ICCT

Component 4. Demonstrating Impacts
   4.1. Monitor, Evaluate, Report Lead: ICCT
   4.2. Promoting the Global Strategy Lead: UNEP
HLA Communiqué

Proposal to the HLA to endorse the new global strategy “cleaning up the global on-road diesel fleet” at the HLA during the Climate COP22 in Marrakech
Conclusions

• With support of the CCAC, the Heavy Duty Diesel Initiative has been able to support many countries and cities to reduce PM/BC emissions
• … introduce low sulfur fuels; introduce cleaner vehicles; ports, green freight; bus fleets …
• we now have developed a global strategy that shows how the world can move to clean heavy duty diesel
• that this is doable and cost effective and will have massive health and climate benefits
• and we hope to work with all of you to make this reality in the coming years
With thanks to our partners:

- **Initiative partners:**
  - C40 Cities, Smart Freight Centre, Clean Air Asia, Environment and Climate Change Canada, Transport Canada, Natural Resources Canada, US EPA, World Bank, Natural Resources Defense Council (NRDC), Centro Mario Molina Chile, national and local governments

- **Actors:**
  - Association for Southeast Asian Nations (ASEAN), CEGESTI, CITAC, Economic Community of West African States (ECOWAS), EnSys, The Gadjah Mada University Center for Transportation and Logistics Studies, KPBB (Komite Penghapusan Bensin Bertimbel), MathPro, Southern African Development Community (SADC), University of California Riverside (UCR), national and local governments
Thank you!