

# Co-benefits of Improving Air Quality

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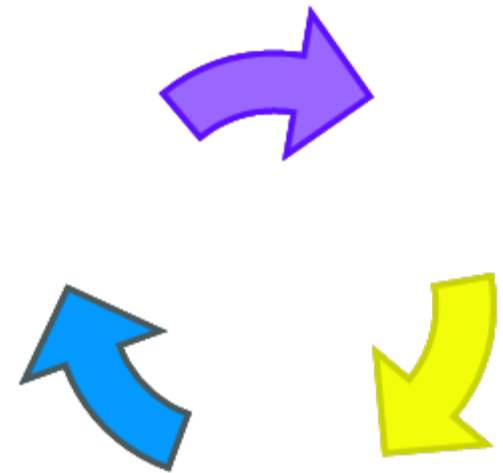
# Co-benefits of Improving Air Quality



## Multiple Benefits Framework for Air Quality – Climate Change - Clean Energy

Local Governments can achieve:

- **Air quality improvements**
  - NO<sub>x</sub> } Ozone
  - VOC } Ozone
  - SO<sub>x</sub>
  - PM
- **Greenhouse gas emission reductions**
- **Energy security and reliability**
- **Energy and cost savings**
- **Economic and workforce development**
- **Public health protection**
- **Quality of life improvements**



Clean Energy: Energy Efficiency, Renewable Energy, Clean Distributed Generation

# Opportunities to Address Ozone and GHG Emissions



## **Mobile Source Solutions:**

- Institute anti-idling policies (Public and private diesel fleets, construction equipment, locomotives, truck stop electrification)
- Promote car pooling, bicycling or other multi-modal transportation options
- Equipment retrofit or modernization programs (e.g., construction and agriculture)
- Encourage use of different fuel strategies (e.g., plug-ins, hybrids)

## **Stationary Source Solutions:**

- Support policies for energy efficiency (EE) and green buildings
  - Maintain or upgrade HVAC systems
  - Install EE lighting
  - Install green roofs or cool reflective roofing
- Improve quality of residential water heaters

## **Area Source Solutions:**

- Encourage use of low VOC paints
- Encourage episodic no lawn mowing days or use of electric lawn mowers

## **Indirect Solutions:**

- Increase tree canopy and develop urban forestry programs – carefully select tree species
- Build walkable, livable communities through land use and transportation planning processes

# Chicago's Anti-idling Programs



- Chicago instituted an Internal Municipal Fleet Anti-idling Policy and City-Wide Anti-Idling Ordinance for on-road diesel-powered vehicles within the City's borders.
- Internal Municipal Policy (Lead by Example in government operations)
  - Developed a policy through the Environment Department and asked each department to encourage anti-idling for city's fleet.
  - Tracking fuel use through GPS system and fuel receipts.
- City Wide Ordinance
  - Amended City Traffic Code to limit idling for 3 minutes within a 60 minute period. <sup>1</sup>
  - Enforcement through any police officer, traffic control aide, parking enforcement aide.
  - Violators will incur \$250 per violation



<sup>1</sup> Chicago's law can be found at: [http://www.cityofchicago.org/content/dam/city/depts/doe/general/ESB\\_PDFs/StandingLimitOrdinanceAsPassed.pdf](http://www.cityofchicago.org/content/dam/city/depts/doe/general/ESB_PDFs/StandingLimitOrdinanceAsPassed.pdf)

# Quantifying emission reductions and co-benefits of anti-idling programs



**Calculate benefits per vehicle and fuel type for your fleet.**

- Vehicle type [On-road heavy duty truck](#)
- Fuel type: [Diesel Fuel](#)
- Fuel cost [\(\\$3.09/gallon\)](#)
- Vehicle model year [\(FY range 2003-2007\)](#)
- Baseline duration of idling [\(6 hrs/day\)](#)
- New reduced idling [\(1 hr/day\)](#)
- NO<sub>x</sub>, CO<sub>2</sub>, - Emission factors (grams/hr)
  - [NO<sub>x</sub> emissions: 135 grams/hour of idling](#)
  - [CO<sub>2</sub> emissions: 10,084 grams/hour of idling](#)

Assumed:

135 grams/hr of NO<sub>x</sub> emissions: [http://tceq.net/assets/public/implementation/air/terp/techsup/TS\\_OVInfrastructure\\_2009.pdf](http://tceq.net/assets/public/implementation/air/terp/techsup/TS_OVInfrastructure_2009.pdf)

0.8 gallons/hr: <http://www.transportation.anl.gov/pdfs/TA/373.pdf>


10,084 grams of CO<sub>2</sub>/gallon of diesel fuel <http://www.epa.gov/oms/climate/420f05001.htm#carbon>

\$3.09/gallon of diesel fuel: <http://www.eia.doe.gov/oog/info/gdu/gasdiesel.asp>

# Example: Estimated Benefits for On-Road Heavy Duty Trucks



If an estimated 8,000 sleeper trucks reduced their idling time from 6 hours/day to 1 hour/day then the estimated benefits would be:

- **5.9 tons of NO<sub>x</sub>/day reduced**
- **445 tons of CO<sub>2</sub>/day reduced**
- **32,000 gallons of fuel/day saved**
- **\$98,880/day saved**  **\$36 million/year**

Note: A 2007 report found that 24,000 trucks traveled along I-35 at U.S. 183 in North Austin, Texas. The estimate above that one-third of the trucks traveling along the interstate stopped at rest stops and reduced idling from 6 hours per day to 1 hour per day. <http://www.statesman.com/news/local/truck-relief-on-i-35-maybe-a-little-718333.html>

Assumed:

135 grams/hr of NO<sub>x</sub> emissions: [http://tceq.net/assets/public/implementation/air/terp/techsup/TS\\_OVInfrastructure\\_2009.pdf](http://tceq.net/assets/public/implementation/air/terp/techsup/TS_OVInfrastructure_2009.pdf)

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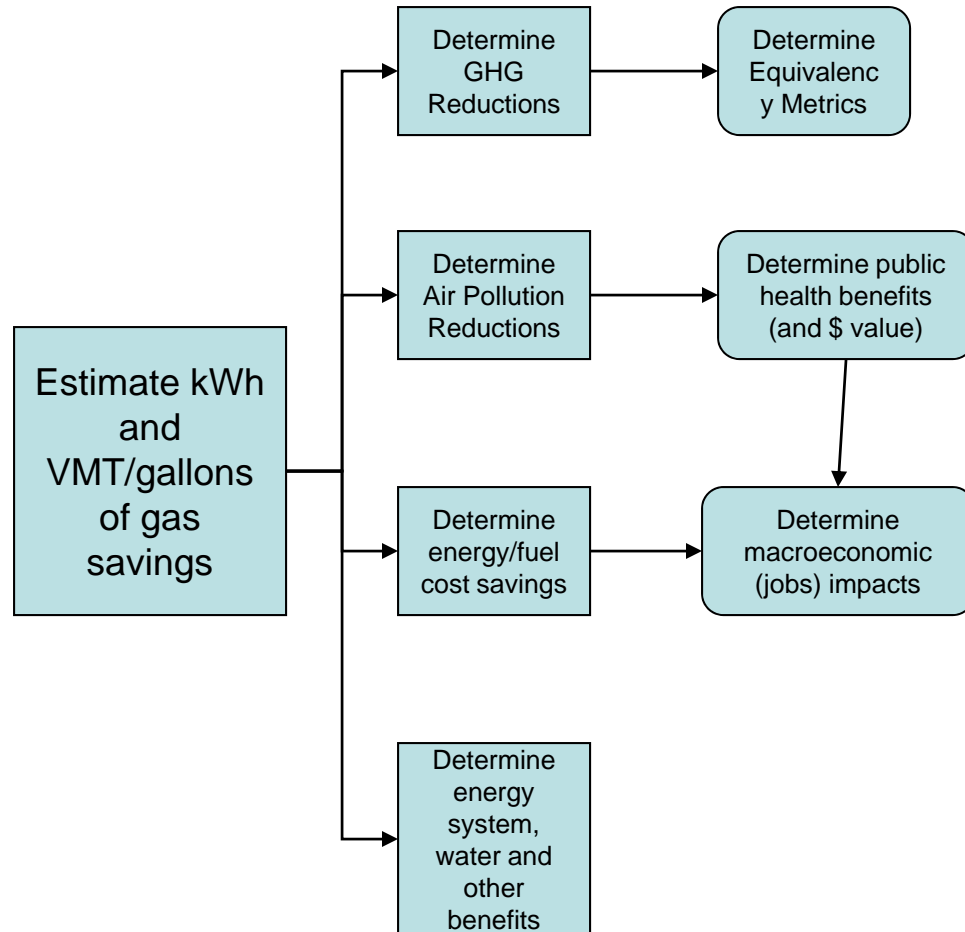
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# Process & Tools for Estimating Co-benefits



**For the second webinar we will walk through examples and quantification tools to “make the case” for your emission reduction strategies**



# Contact Information

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