

7. Assessment of High Priority Source Categories and Overview of White Papers

7.1 Introduction

DEQ and an independent Contractor, Eastern Research Group (ERG), performed PATS emission reduction strategy evaluation in two phases. In phase one, DEQ and ERG evaluated a list of emission source categories and toxic air pollutants provided by DEQ and created a priority list of categories to be evaluated for emission reduction strategies. In addition, DEQ, ERG, and PATSAC worked together to create an initial brainstorm list to identify potential new emission reduction measures. In phase two, in a series of white papers for priority categories, DEQ and ERG performed a comparative evaluation of the emission reduction strategies that are above and beyond existing local, state, and/or federal strategies.

DEQ and PATSAC worked in collaboration to create a clear and concise white paper format that will inform future committees in post-PATSAC efforts. The structure for each of the source category white papers includes, but is not limited to, the following:

- Source Category Description and Modeling Results
- Summary of Existing Emission Reduction Measures
- Summary of Potential New Emission Reduction Measures
- Details for each Potential New Emission Reduction Measure

DEQ and Contractor evaluated each new emission reduction measure in sections three and four of the white papers using the following four PATSAC considerations: magnitude of emission reductions, timeframe to reduce emissions, technical feasibility, and a cost summary. In addition to these four core considerations, PATSAC developed additional comprehensive factors to consider when developing emission reduction strategies (see [section 2.3.3](#)). The additional considerations include, but are not limited to, implementation, funding, non-regulatory approaches, effect on exposure, cost effectiveness, health benefits, and risk distribution. In the transition from Phase one to Phase two, there were several source categories that were not prioritized or included for evaluation due to their limited contribution to the projected 2017 emissions inventory, but they may still be considered as a means for additional emission reductions. All white paper strategies are draft and in need of further research, analysis and refinement. DEQ anticipates that the further refinement will occur in future stakeholder committees and related efforts.

The white papers are a collection of potential new emission reduction measures. The white papers provide a comparative analysis for each source category to help inform PATSAC and DEQ recommendations. Section 7.2 presents an overview of the area and mobile emission source categories in order of cumulative risk as determined from the 2017 projected modeling results. Section 7.3 presents an overview of the point source emission source categories in alphabetical order. The full white papers are included in the [Strategy Development Appendix 12.9](#).

7.2 Area and Mobile Emission Source Categories

7.2.1 Residential Wood Combustion and Heating

1) Residential Wood Combustion and Heating Description

In the PATS study area, roughly 2% of housing units are heated by wood. The remaining 98% of the housing in the area is heated by oil, natural gas, electricity, kerosene, liquid or gas propane, solar, or other. Almost half of heating is done using natural gas (47%); 41% is electricity; and other fuels make up 9% or less of the total.

2) Pollutant Risk Driver Summary

Residential wood combustion is the source category that causes the most risk within the PATS study area. Most pollutants emitted by residential wood combustion are risk drivers for the PATS study area as a whole, but the pollutants causing at least 10% of the risk within this category are 15 PAH, 1,3-butadiene and formaldehyde.

Because of the overwhelming contribution of secondary formation to formaldehyde concentrations, the primary residential wood combustion pollutant capable of control is 15 PAH.

Residential wood combustion emits 75% of 15 PAH within the PATS area. **The target reduction for 15 PAH from residential wood combustion is 97%.** Residential heating other than wood also contributes risk in the form of cadmium emissions.

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

For residential wood combustion and heating, potential emission reduction measures include incentives or education to encourage purchase of new more efficient furnaces, heaters, boilers or woodstoves; maintaining and operating the equipment efficiently; weatherization programs to reduce fuel use; education programs to improve user practices; and several different regulations. Potential regulations include regulations to improve wood fuel quality (regulate moisture content); to improve user practices (opacity standard for wood smoke); to ban wood burning devices in new homes and to ban the use of uncertified woodstoves.

5) Matrix

The matrix in Table 25 summarizes information for potential strategies to reduce emissions from wood combustion.

Table 25: Core Evaluation of Residential Wood Combustion Strategies

Potential Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical Feasibility	Cost
#1: Create a stable and ongoing funding source for woodstove replacement	26 to 46% (15 PAH)	3-10 years	Feasible	50 to 150 million
#2: Ban all wood burning devices or wood burning fireplaces in new homes	0.1 to 9% (15 PAH)	1-5 years	Feasible	Cost of regulation
#3: Revive tax credits and other funding assistance for efficient home heating	Unknown	Immediate	Feasible	Depends on scope
#4: Ban uncertified woodstove use (with exceptions for low income or if wood is the primary heat source)	Not yet calculated	1-5 years	Feasible	Cost of regulation
#5: Weatherization incentives	Unknown	1-10 years	Feasible	Depends on scope
#6: Promote existing weatherization programs	Unknown	1-3 years	Feasible	Depends on scope
#7: Implement an education program to improve woodstove user practices	Unknown	1-3 years	Feasible	4,000 to 20,000
#8: Implement opacity standard for wood smoke	Unknown	1-5 years	Feasible	Cost of regulation
#9: Regulate wood fuel moisture content	Unknown	1-5 years	Feasible	Cost of regulation
#10: Research emission reductions from manufactured firelogs	Unknown	1-3 years	Feasible	Not calculated

There is a **gap of 51% between the target reductions for risk driver pollutants for this source category and the reductions achievable based on strategies where emission reductions have been quantified. Strategies where the emission reductions are unknown could reduce this gap.*

6) Assumptions and Limitations

This source category contributes the most risk within the PATS area, and the risk is area-wide. Several emission reduction measures are feasible and have successfully reduced emissions from residential wood combustion in other areas of the state, or in other states. Woodstove change out incentive programs have been effective in reducing emissions from woodstoves in several areas in Oregon. These programs can require large amounts of funding for woodstove replacements. Research is needed on the potential reductions from regulating moisture content, implementing an opacity standard, or from using manufactured fire logs in place of wood in fireplaces. Achieving emission reductions will require either funding or new regulations. Regulatory authority for DEQ or local government would need to be evaluated for any regulatory strategies.

The data quality for the residential wood combustion source category was rated C (good). The data quality for residential heating other than wood is D (acceptable).

7) PATSAC Member Feedback

- Get better emission factors for Fireplace 15PAH emissions in the future.
- Support weatherization that does not introduce materials that increase indoor air pollution.
- Do not promote fire log use since there are large uncertainties associated with it (precautionary principle). Change strategy to “research emission reductions from manufactured firelogs.”
- Add strategy/description for geothermal heat pumps and passive solar space heating.
- For the weatherization strategy focus on low/no VOC construction, clarify strategy, and highlight the large co-benefits from weatherization.
- Check authority of local/state government on bans of fireplaces, etc.
- For the natural gas strategy, subtract cost of natural gas incentives from cost of strategy.
- Update costs summaries for switching to high-efficiency furnaces to capture programs that help pay for the changes.

7.2.2 On Road Gasoline

1) On Road Gasoline Description

Air toxic pollutants in this source category are generated by the use of gasoline in internal combustion engines. They occur throughout the Portland metropolitan region with the highest concentrations occurring in areas of high vehicle traffic. On road gasoline vehicles are subject to regulations that limit the emissions of new cars and trucks. To meet emission requirements automakers developed better engine designs, computerized engine controls and pollution control technology such as catalytic converters. These efforts reduced the emission of traditional pollutants to a fraction of what they were in the second half of the 20th century.

Corporate Average Fuel Economy standards and Oregon’s greenhouse gas emission limits both reduce the amount of gasoline consumed by vehicles. They therefore reduce metallic air toxics that may be naturally present in gasoline and that are not reduced by pollution control equipment. These include arsenic, cadmium, chromium VI, manganese, and nickel.

2) Pollutant Risk Driver Summary

Most pollutants emitted by on road gasoline emissions are risk drivers for the PATS study area as a whole, but the pollutants causing at least 5% of the risk within this category are 15 PAH, benzene, 1,3 butadiene, formaldehyde, arsenic and chromium. Because of the overwhelming contribution of secondary formation to formaldehyde concentrations (69%), it is not a risk driver targeted in this category.

On road gasoline emissions are highest within 500 meters of high volume roadways. However, because much of the study area is developed, on road gasoline emissions influence risk in much of the PATS study area. **The target reductions for the on road gasoline source category are as follows: 15 PAH = 95%; benzene = 86%; 1,3 butadiene= 88%; Arsenic = 64%; and Chromium = 25%.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

Potential measures to reduce air toxic emissions from on-road gasoline vehicles are selected from policies that either are used in other areas, or are being developed for possible adoption to support other goals. The most noteworthy policy development efforts being considered in the Portland region are conducted by Metro, the Portland area’s regional government, and the Oregon Department of Transportation to reduce greenhouse gas emissions. Under House Bill 2001 (2009 legislature) and Senate Bill 1059 (2010 legislature), Metro is beginning a “scenario planning” process targeted at cutting vehicle use per person about 21 percent. The process is beginning in 2011 and is scheduled for completion in 2014. At the same time, the Oregon

Transportation Commission will consider implementing additional “statewide measures” that can be applied throughout Oregon.

The potential policies listed by PATSAC to reduce air toxics coincide well with the “scenario planning” and “statewide measures.” Most policies being seriously considered by Metro and ODOT are those identified in a landmark report titled “Moving Cooler” released by the consulting firm of Cambridge Systematics in 2009. Substantial resources have been committed to investigate the feasibility and effectiveness of these measures. For example, ODOT created a sophisticated computer model dubbed GreenSTEP to estimate how different policies work in various combinations. ODOT is also working with Cambridge Systematics to develop a “tool kit” database that metropolitan areas can use to evaluate different strategies. The tool kit database is due to be released to the public in 2011, but a preliminary printout of its contents is included with the full on road gasoline white paper as Attachment A. Due to the availability of these resources and the strong possibility some will be adopted to reduce greenhouse gases, PATSAC’s strategies are organized in the format used by the larger ODOT/Metro undertaking.

5) Matrix

The matrix in Table 26 summarizes information for potential strategies to reduce emissions from on road gasoline engines.

Table 26: Core Evaluation of On Road Gasoline Strategies

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Cost
#1: Cleaner Vehicles			
#1a: Advanced Emission Standards: California Low Emission Vehicle III, or EPA Tier III Emission Limits (Greenhouse Gases and VOCs)	For new vehicles: VOCs=75% Metal Air Toxics=27% to 54%	2017 to 2025	Net Savings
#1b: Accelerated Fleet Turnover	0.8 to 1.8%	Long term	Variable
#1c: Fleet Vehicle Purchase Criteria	Low	Multi-year phase in	Low
#1d: Vehicle Scrappage Program	Undetermined	Near Term	High
#1e: Electric Vehicle Conversion	100% per vehicle	Near term	Approx. \$10,000 per vehicle
#1f: Compressed Natural Gas Vehicle Conversion	VOCs: 75% per vehicle	Near term	\$5,000 to \$10,000 per vehicle
#1g: More Frequent Vehicle Inspections	VOCs 1%	1-2 Years	High
#2: Cleaner Fuels			
#2a: Reformulated Gasoline	Pending	Near Term	~\$0.05 per gallon
#2b: Tier III/Lower Sulfur Gas	Necessary to achieve Advanced Emission Standards	2017 to 2025?	Low
#2c: Low Carbon Fuel Standard	Modest	10 yr. phase in	Net savings

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Cost
#2d: Increased Use of E 85 in Flex Fuel Vehicles ¹	~75% benzene reduction per vehicle	Mid term	Variable
#3: Vehicle Miles Travelled Reduction			
<u>#3a: Metro's "Climate Smart Communities" Strategies</u>	Reduce Vehicle Miles Travelled per capita up to 24% by 2035	2014 to 2035	Probable net saving
• Congestion Pricing (Toll)	0.8 to 1.8%	Near term	Net savings
• Parking Fees	0.8 to 1.8%	Near term	Net saving
• Transit Service Increase	Up to 1.1% Reduction	Variable	Cost exceeds savings
• Stronger Employee Commute Options Rules	<1.7%	Near term	
• Eco Driving Training	0.8% to 2.3%	Mid term	Net savings
• Personalized Total Demand Management Marketing			
• Anti-Idling	Likely Air Toxics Reduction (no data)	Immediate	Net savings
• Bike Improvements	0.09 – 0.28%	Long term	Variable
• Pedestrian Improvements	0.10 – 0.31%	Long term	Variable
• Operations/Transportation Management	0.1 to 0.6%	Multi year	Variable
<u>#3b: OTC "Statewide Strategies"</u>	High	2014 to 2035	Probable net saving
• 55 MPH Speed Limit	1.2 to 2.0%	Near term	Net savings
• Pay As You Drive (PAYD) Insurance for All	7% to 12%	Near term	Net savings
• Vehicle Miles Travelled Fee: 2 to 5 cents/mi.	0.8% to 2.3%	Near term	Net savings
• Gas Tax (Increased): \$0.60 by 2015, \$1.25 by 2050	Up to 17% in 2050	Quick initial effects	\$0.60 to \$1.25/gal.
• Gas Tax (European Level): \$2.40 by	Up to 28% in 2050	Quick effects	\$2.40 to \$5.00/gal.

¹ Flex fuel vehicles can use gasoline, a blend of 15% gasoline and 85% ethanol, or a mix of the two.

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Cost
2015, \$5.00 by 2050			
• Bottleneck Relief	0.05% to 0.21% in limited applications	Multi Year	Variable
• Compact mixed-use development	0.2% to 3.9%	Long term	Net savings

* There is **an unknown gap** between the target reductions for risk driver pollutants for this source category and the reductions achievable that is difficult to quantify for this source category.

6) Assumptions and Limitations

All strategies are technically feasible. Emission reductions indicated are approximate values that can be produced by the different strategies.

The data quality for risk driver pollutants from the on road gasoline source category is B (Very Good) for high volume roads and C (Good) for low-volume roads.

7) PATSAC Member Feedback

- Recent developments were not included in the Metro 2017 projection so the emissions situation may be better than DEQ projects.
- Consideration of strategies should capture biofuel disadvantages (indirect) and hybrids (mining impacts).
- Additional measures could include restricting drivers, i.e. raise driving age (look at European licensure age and its impact on vehicle miles travelled).
- Consider further review of the policy to allow Oregon Trails Card holders to use TriMet free or at a discount.
- Link the Federal Highway Administration table/study to the on road gasoline white paper.
- Evaluate the impact of studded tire use. Identify the impact to road repairs and congestion.
- Consider whether DEQ should have greater authority with respect to on road measures and rulemaking.
- Empower DEQ's voice to support agency involvement with how air pollution affects communities.
- Include local or state (depending on scope of project) public health officials in transportation and land use planning committees and commissions.

7.2.3 Non road Diesel

1) Non road Diesel Description

According to *OregonLaws.org*, the legal definition of non road Oregon diesel engines means “any Oregon diesel engine that was not designed primarily to propel a motor vehicle on public highways of this state.” Non road diesel engines encompass a wide variety of equipment types and uses. Non road diesel engines can be found in construction, commercial, industrial, agricultural, logging, lawn and garden, and recreational equipment. Non road diesel engines are also found in locomotives and marine vessels. Given the variety of applications non road diesel engines are used in, they are widely dispersed across all areas of the state.

2) Pollutant Risk Driver Summary

Most pollutants emitted by non road diesel are risk drivers for the PATS study area as a whole, but the pollutants causing at least 10% of the risk within this category are diesel particulate matter (PM) and 15 PAH. **The target reduction for diesel PM from the non road diesel source category is 92%.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

Potential strategies include increasing fleet turnover rates, use of alternative fuels, employing various retrofits, routine maintenance, and idle reduction strategies.

5) Matrix

The matrix in Table 27 summarizes information for potential strategies to reduce emissions from non road diesel engines.

Table 27: Core Evaluation of Non Road Diesel Strategies

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility ^a	Cost
#1: Accelerated retirement	Variable ^b	Immediate	High	Hundreds to tens of thousands ^c
#2: New vehicle purchase assistance	Variable ^b	Immediate	High	Hundreds to tens of thousands ^c
#3: Scrappage/takeback programs	Variable ^b	Immediate	High	Hundreds to tens of thousands ^c
#4: PM retrofits	25-90% (diesel PM)	Immediate	High ^c	Thousands to mid ten thousands per retrofit ^c
#5: SCR retrofits - SCR	50% (diesel PM)	Medium-Long term	High ^c	Low ten thousands per retrofit ^c
#6: Hybridization	Unknown	Med-Long	Low-Med	Unknown
#7: Biodiesel	16% (diesel PM)	Immediate	High	Low-medium (depends on fuel use)
#8: Electrification	100% (diesel PM)	Variable ^c	Variable ^c	Incremental cost – hundreds to low thousands for available equip types
#9: Conversion to CNG/LPG	85% (diesel PM)	Variable ^c	Variable ^c	Low ten thousands per conversion
#10: Engine repowering	Variable ^b	Immediate	High (large engines)	Hundreds to tens of thousands ^c
#11: Inspection & maintenance program	Some anticipated reductions	Med-term	Low	Millions of dollars
#12: Auxiliary power units	50% (diesel PM)	Immediate	High	\$8,000
#13: Idle reduction measures	Variable ^b	Immediate	High	Variable – depends on program
#14: Fuel on-board heaters	13.6% (diesel PM)	Immediate	High	\$1,000

** If Strategy #8 were implemented for every nonroad engine in the PATS area, there would be no gap between the target reductions for risk driver pollutants for this source category and the reductions achievable.*

^aNot all strategies will be appropriate for all equipment types. This will largely be determined by use profiles, size of equipment, and configurational constraints.

^bReduction % dependent on equipment in question, annual use, and horsepower

^cThis is highly dependent upon the equipment type, size, and use profile.

6) Assumptions and Limitations

Nonroad diesel emissions are related to construction activity, which can occur in any part of the PATS study area. In the PATS model, construction activity was attributed to land use in the residential, commercial/institutional and industrial categories. This resulted in higher concentrations in the Western portion of the study area, providing an example of elevated concentrations that could be reasonably anticipated in various locations as future development and construction occur.

The reductions and cost described in the Matrix above for all strategies except #11 and 13 are per vehicle. It is unlikely that all vehicles in the PATS area could be addressed by a single strategy. There are many proven technologies available. Implementation of the strategies can include voluntary, incentive and mandatory approaches. Each of these approaches has differing strengths and weaknesses, e.g., availability of public financial assistance, costs for compliance and flexibility for the diesel owner, assurance that air quality targets are met and over what timeframe and staffing needs for implementation. All strategies are scalable and the extent of the reduction will depend upon the penetration of the strategy within the target sector, which will in turn depend upon the level of vigor and commitment behind the chosen implementation method displayed by the implementing agency, interested community groups and affected stakeholders.

The data quality for risk driver pollutants from the nonroad diesel source category is D (Acceptable).

7) PATSAC Member Feedback

- Include diesel as a significant (not part of aggregate insignificant) activity covered by air permits so that emissions are tracked and can be addressed.
- Government contracts should require clean engines and fuels.
- Review how the emissions are split for ultra-low sulfur vs. conventional diesel.
- Review how the bio-diesel mandate applies to nonroad diesel applications.
- Further review of the feasibility of PM retrofits.
- Clarify costs in table 8 regarding 'hundreds to tens of thousands, depending on equipment type.
- Biodiesel – impacts to engine warranties, restrictions on percentage of biodiesel needs to be addressed.
- It would be helpful to have a breakdown of emissions inventory by medium/heavy duty.
- Review Selective Catalytic Reduction cost estimates, particularly with respect to return on investment (reference TriMet).
- Need to address variable costs in addition to capital costs.
- Review how congestion relief for truck traffic may be alleviated through marine corridors.
- Point sources may have the ability to incentivize how construction equipment/practices are performed and utilized. There may be an avenue to institute emissions limits through contract specifications.
- Promote the use of new technologies in industry.
- There is a need to overcome the challenges of financial incentives towards retrofits. Identified challenges: magnitude of incentive to affect change, improved relations/trust building from industry, reduced paperwork. Ultimately, design issues must be addressed to remove the barriers/challenges for success.
- Grants to retrofit garbage/recycling trucks could be recouped through rate increases.

7.2.4 On Road Diesel

1) On Road Diesel Description

This source category includes medium and heavy duty trucks, including trucks that make deliveries within the Portland metro area and trucks that are used mainly in interstate freight movement.

2) Pollutant Risk Driver Summary

Most pollutants emitted by on road diesel are risk drivers for the PATS study area as a whole, but the pollutants causing at least 5% of the risk within this category are diesel particulate matter, 15 PAH, benzene, 1,3 butadiene, arsenic and chromium. Because of the overwhelming contribution of secondary formation to formaldehyde concentrations (69%), it is not a risk driver targeted in this category. **The target reduction for diesel PM from the on-road diesel source category is 91%.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

Strategies include speeding turnover of fleet to cleaner, new diesel engines, increasing the fleet mix of alternate fuel engines and use of alternate fuels (CNG, biodiesel, propane, and electricity), retrofitting or repowering existing engines, maintaining engines, reducing idling, and improving efficiency.

5) Matrix

The matrix in Table 28 summarizes information for potential strategies to reduce emissions from on road diesel engines.

Table 28: Core Evaluation of On Road Diesel Strategies

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost ^a
#1: Speed turnover of fleet to cleaner engines	80% (Diesel PM)	Voluntary: Upon funding Mandated: Up to 17 years	Feasible	\$5,000 - \$131,000 per vehicle
#2: Increase fleet mix of alternate fuel engines	Compared to pre 2007 - 15-90% (Diesel PM)	Voluntary: Upon funding Mandated: Up to 17 years	Feasible	CNG: \$30,000 - 80,000 per vehicle + fueling infrastructure B20: additional \$0.25 per gal
#3: Retrofit: exhaust aftertreatment	90% (Diesel PM)	Voluntary: Upon funding Mandated: Up to 17 years	Feasible	\$9,000 - 15,000 per truck;
#4: Repower existing engines	25% - 50% (Diesel PM)	Voluntary: Upon funding Mandated: Up to 10 years	Feasible	\$30,000- 50,000 per truck
#5: Maintain Engines	Unknown	Voluntary: Upon funding Mandated: Up to 9 years	Feasible	Dependent on engine and frequency of inspection; costs

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost ^a
				could be offset by fuel consumption improvements
#6: Reduce Idling	Truck stop electrification: 100% of local emissions (diesel PM); Long duration idling, 8-10 hours a day may constitute up to 8% of all PM emissions on a daily basis.	Voluntary: Upon funding Mandated: Up to 11 years	Feasible	Truck stop electrification up to \$10,000 per space Auxiliary Power Unit \$8,500; Diesel fired heater, \$1,600; Engine start/stop \$3,800
#7: Improve Efficiency	Fuel efficiency improvements up to 40% with corresponding reductions in emissions	Voluntary: Upon funding Mandated: Up to 9 years	Feasible	Dependent on tactic, some with return on investment less than 12 months

** If Strategy #2 or 3 were implemented for every on-road engine in the PATS area, there would be a 1% gap between the target reductions for risk driver pollutants for this source category and the reductions achievable. It is unlikely every vehicle could be affected, even by a mandatory strategy.*

6) Assumptions and Limitations

The risk from this source category is area wide, with higher risk along roadways with more diesel traffic. Understanding that many proven technologies are available, the method of implementation is a more critical factor in achieving air quality goals. That implementation method can include, either singly or in combination, voluntary, incentive and mandatory approaches. Each of these approaches has differing strengths and weaknesses that merit consideration in how the strategy is implemented, e.g., availability of public financial assistance, costs for compliance and flexibility for the diesel vehicle owner, assurance that air quality targets are met and over what timeframe and staffing needs for implementation, to name a few. Strategy selection should also take in to consideration that the Portland area is both a transportation and economic center for Oregon and SW Washington and that many diesel engines that travel into the region do not reside here. This can present challenges for jurisdiction and authority in designing either voluntary or regulatory strategies for these vehicles. All of these strategies are scalable and the extent of the reduction will depend upon the penetration of the strategy within the target sector, which will in turn depend upon the level of vigor and commitment behind the chosen implementation method displayed by the implementing agency, interested community groups and affected stakeholders.

The data quality for risk driver pollutants from the on-road diesel source category is B (Very Good) for high-volume roads and C (Good) for low-volume roads.

7) PATSAC Member Feedback

- Calculate toxicity-weighted health benefits.
- DEQ should follow up on the projected level of trucks in 2017 that have EPA approved 2007 or newer engines.
- The white paper needs to include DEQ's Low Carbon Fuel Standard and biodiesel mandate, as well as the proposed idling regulation. DEQ needs to ensure that their impacts are accounted for in the modeling.

- Improve consistency in the on road diesel White Paper. Particularly in Table 6 which indicates reductions compared with EPA estimates for 2007 or newer engines.
- Evaluate strategies based on a “least cost” approach.
- When developing priorities, all strategies should be included rather than segregating strategies based on fuel type or source.
- Include other measures: intelligent transportation systems such as signalization/scheduling for trucks, House Bill 2081 (idling), remove barriers to retrofits and new unit purchases, incent marine freight to take burden off highways and reduce congestion.
- Provide models where incentives have had success to understand effectiveness.
- How does electrification, and the shift of emissions to power plants compare to the emissions attributed to the current scenario?
- Review how non-technical measures (i.e. scheduling) might have mitigation impacts. One opportunity may be to improve signalization.

7.2.5 Nonroad Gasoline

1) Nonroad Gasoline description

Nonroad gasoline engines refer to 2-stroke and 4-stroke spark-ignition (SI) engines, as opposed to 2-stroke and 4-stroke diesel engines that are labeled as diesel in this report. These engines are regulated as large (>25 hp, 19 kW) or smaller types. The larger engines are primarily used in forklifts, but are also found in a variety of industrial and commercial applications. The smaller engines are found primarily in lawn and garden equipment, but are also found used in small generators, pumps (including pressure washers) and other portable equipment. In smaller engines, 2-stroke engines designs are often used when lower engine weight for the power is desired such as for handheld equipment including chainsaws, blowers, and trimmers. The SI engines typically use gasoline fuel; however, liquid petroleum gas (LPG) and compressed natural gas (CNG) are also used.

2) Pollutant risk driver summary

Most pollutants emitted by nonroad gasoline emissions are risk drivers for the PATS study area as a whole, but the pollutants causing at least 10% of the risk within this category are 15 PAH, benzene, 1,3 butadiene, and formaldehyde. Because of the overwhelming contribution of secondary formation to formaldehyde concentrations (69%), it is not a risk driver targeted in this category. **The target reductions for the nonroad gasoline source category are as follows: 15 PAH = 96%; benzene = 86%; and 1,3 butadiene= 90%.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

The spark-ignition (SI) nonroad engines are used in a wide array of commercial and personal equipment using small handheld, portable, or large self-propelled equipment. The three strategies reviewed account for the different approaches that could be used relative to the different equipment types and usage and include the California fleet average accelerated scrappage/retirement program, either new or replacement electric equipment use, and idle reduction measures.

5) Matrix

The matrix in Table 29 summarizes information for potential strategies to reduce emissions from non road gasoline engines.

Table 29: Core Evaluation of Non Road Gasoline Strategies

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: California/ Scrappage Controls	19% (15 PAH) 21% (Benzene) 24% (1,3 butadiene)	5-10 years	Feasible	\$10,000 - \$20,000 for larger equipment additional cost over replacement value of current equipment.
#2: Electrification Program	75% (15 PAH) 75% (Benzene) 75% (1,3 butadiene)	5-20 years	Feasibility depends upon the equipment type	\$10,000 - \$20,000 for larger industrial equipment (e.g. >25 hp forklifts) and as low as \$20 for low power personal equipment (e.g. >1 hp trimmers) incremental to gasoline powered equipment.
#3: Idling reduction	5% (15 PAH) 5% (Benzene) 5% (1,3 butadiene)	1-5 years	Education programs and targeted automatic idle shut down devices.	Automatic systems for larger industrial equipment would have a cost.
#4: Reduced Use				

* There is a **gap of 11% to 21%** between the target reductions for risk driver pollutants for this source category and the reductions achievable if Strategy #2 were applied to every nonroad gasoline engine in the PATS area.

6) Assumptions and Limitations

Because of the wide variety of equipment types using these SI engines, it may be best to consider the equipment and its use to determine the most effective emission reduction strategies. To date, California has only considered large equipment types for forced mandatory replacement because the owner/operators are largely industrial. Smaller equipment may be owned by households or small businesses, and smaller equipment may be more easily replaced by electric equipment types. Finally, in the event that equipment cannot be scrapped or replaced with electric types, idle reduction may be the only emission reduction method available.

Strategy #4, which was suggested at the 4/14/2011 PATSAC meeting, has not yet been evaluated.

The data quality for risk driver pollutants from the nonroad gasoline source category is D (Acceptable).

7) PATSAC Member Feedback

- Review the other measures from the initial brainstorm list and consider how are these measures are integrated in the white papers
- Consider the utilization of non-powered alternatives (push mowers, rakes, etc.)
- There is a need to characterize the benefits/limitations of the use of propane as an alternative fuel
- How does the committee address formaldehyde reductions? What focus/recommendation should this committee have given the magnitude of secondary emissions?

7.2.6 Solvent/Coating Use-Paint Strippers & Architectural

1) Solvent/Coating Use – Paint Strippers and Architectural Description

Coatings include adhesives, paint, sealant, finishers, and other products that are applied to a surface. The pollutants in this source category are from commercial and industrial applications, as opposed to the solvents

contained in consumer products. Solvents are typically used to remove paint or other coatings from metal, wood, and other surfaces. In most cases, the emissions are not released from a stack but are released as the product is used and are locally dispersed. In the case of furniture strippers, often a “dip tank” will be used, where the solvent is literally in a tank large enough to dip furniture.

2) Pollutant Risk Driver Summary

Most pollutants emitted by solvent use are risk drivers for the PATS study area as a whole, but the pollutant causing at least 10% of the risk within this category is naphthalene. **The target reduction for naphthalene from solvent/coating use is 88%.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

Emission reductions could come from consumer education, improved work practices, or product specifications through regulation. Because of the nature of solvent and coating use, add-on controls are unlikely except in the case of large scale stripping operations. Substituting lower emitting components is a possible emission reduction strategy. DEQ’s Ecological Business Solutions program, or EcoBiz could, be augmented by adding a business category for solvent/coating operations. Another potential reduction strategy is to adopt California rules, which contain VOC limits and product labeling laws.

5) Matrix

The matrix in Table 30 Core Evaluation of Solvent and Coating Strategies summarizes information for potential strategies to reduce emissions from solvents and coatings.

Table 30: Core Evaluation of Solvent and Coating Strategies

Potential Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Implement an education and outreach program	Unknown (naphthalene)	1-10 years	Feasible	Cost to agency to develop; results mean improved health/reduced health care costs
#2: EcoBiz Certification	Unknown (naphthalene)	1-10 years	Feasible	Companies who participate in the EcoBiz program receive free “advertising”. Cost to agency to develop category.
#3: Research & develop alternative lower emitting components	Unknown (naphthalene)	1-10 years	Needs research	Unknown—cost of R&D; production costs could be less
#4: Adopt California Rules	Unknown (naphthalene)	1-3 years	Feasible	Cost of rulemaking
#5: Expand Oregon Health Authority capacity to regulate consumer products	Unknown (naphthalene)	2-4 years	Feasible	Cost of rulemaking and implementation of new authority

** There is potentially a **100% gap** between the target reductions for risk driver pollutant (naphthalene) for this source category.*

6) Assumptions and Limitations

The geographic distribution of consumer product emissions and exposures is widespread in the PATS study area, with higher estimated concentrations in residential and commercial areas. Some strategies have worked in other areas to reduce air toxics, such as the California VOC limits and labeling laws. These strategies are technically feasible. Further research would be required to implement strategy #4. For strategies 4 and 5, political support would be necessary for the Oregon legislature to make changes to law.

The data quality for risk driver pollutants from the Solvent/Coating Use – Paint Strippers and Architectural source category is C (Good).

7) PATSAC Member Feedback

- Add a strategy for (or include in Strategy #5): Consumer product labeling (California rules). Require labels, and use other methods, to provide information about toxic components in consumer products (right to know approach).
- Onus to protect the public from harmful ingredients should be on the product manufacturer/seller not the public.
- Review lessons learned from architectural spray coating effort in the 90s, resulting in no effect.
- Determine impact of furniture strippers on environmental justice communities.
- Support legislation that would give the Oregon Health Authority the authority to remove products from the market that cause chronic (as well as acute) hazards to public health.
- Expanding Oregon’s statutory definition of “hazardous substance” would expand the ability of Oregon Health Authority (OHA) to require labeling, recall products, and otherwise regulate solvents classified as consumer products. Expanding OHAs authority to require manufacturers to provide information necessary to determine whether a product poses a health risk is also an important part of ensuring that OHA is able to protect public health. This would allow OHA to implement policies to promote the use of less toxic alternatives to products currently used.

7.2.7 Consumer Products

1) Consumer Products description

This category is broad and includes personal care products, nail salon products, automotive products, clothing, gas cans, paints, solvents, adhesives, adhesive removers, and other household cleaning and garden/landscape products. Most of these products are used in homes of all socio-economic groups and areas, so this category disperses air toxics throughout the PATS study area and populated regions of the state.

2) Pollutant Risk Driver Summary

Most pollutants emitted by consumer product use are risk drivers for the PATS study area as a whole, but the pollutants causing at least 10% of the risk within this category are naphthalene and dichlorobenzene. **The target reduction for naphthalene is 88% and for dichlorobenzene it is 44%.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

Potential strategies to address emissions include a Portable Fueling Container Trade-Out Program; implementing regulations in Oregon such as the Safe Cosmetics Act of 2010, or a VOC limit and prohibition of certain toxics for consumer products and product labeling similar to California requirements; and to expand EcoBiz to include painters of residential and commercial buildings.

5) Matrix

The matrix in Table 31 summarizes information for potential strategies to reduce emissions from consumer products.

Table 31: Core Evaluation of Consumer Product Strategies

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Smart fuels portable fueling container trade-out program	Unknown (naphthalene, dichlorobenzene)	1-2 years	Feasible	Not calculated
#2: Safe Cosmetics Act 2010/ state requirements for personal care products in OR	Unknown (naphthalene, dichlorobenzene)	1-3 years	Feasible	Cost of regulation
#3: VOC limit legislation on general purpose cleaners and other consumer products/ prohibition of certain toxics from some common consumer products, product labeling (similar to California rules)	Unknown (naphthalene, dichlorobenzene)	1-4 years	Feasible	Cost of regulation
#4: Expand Oregon Health Authority Capacity to regulate consumer products	Unknown (naphthalene, dichlorobenzene)	2-4 years	Feasible	Cost of regulation
#5: Expand EcoBiz to new sectors	Unknown (naphthalene, dichlorobenzene)	1-3 years	Feasible	Participating companies receive free “advertising”. Cost to agency to develop category.

* *There is **an unknown gap** between the target reductions for risk driver pollutants for this source category*

6) Assumptions and Limitations

The geographic distribution of consumer product emissions and exposures is widespread in the PATS study area, with higher estimated concentrations in residential areas. Some of the strategies have worked in other areas to reduce air toxics, such as strategy #3, the VOC limits legislation and labeling laws. For strategies 2, 3, and 4, political support would be necessary for the Oregon legislature to make changes to law. The data quality for the consumer products source category was rated D (acceptable).

7) PATSAC member feedback

- Support Legislature giving Oregon Health Authority the authority to remove products from the market that cause chronic (as well as acute) hazards to public health. Opportunity may be to expand Oregon Health Authority capacity to regulate consumer products.
- Require labels, and use other methods, to provide information about toxic components in consumer products (Right to Know approach).
- Onus to protect the public from harmful ingredients should be on the product manufacturer/seller not the public.
- Improve the source category organization. Consumer products sources are mixed with industrial sources.
- Track reforms in the Federal Toxic Substances Control Act which would encourage alternative formulations and zero VOC coatings.
- Review a more comprehensive approach to addressing education and advocacy focusing on consumer education and policy reform.
- Because of limitations with consumer education, better toxics reform is needed.
- Review a strategy to remove mothballs/flakes from stores.

7.2.8 Railroads

1) Railroad Description

Portland has considerable amount of rail activity as freight is transported east from the ports and north/south along the Pacific coast. Over 40 percent of the rail line-haul activity in Portland is cargo passing through the region. Pass through traffic originates and terminates at locations outside of the Portland metropolitan area. The railroad emissions in Portland result primarily from diesel fuel combustion in yard locomotives that disassemble and combine railcars into trains for the transport of freight and line haul locomotives that operate over longer distances and often outside the PATS area. Rail represents an efficient method of cargo transport, requiring on average less energy per ton of cargo moved. Locomotives have become about 16 percent more efficient over the last decade, but additional improvements can be made.

2) Pollutant Risk Driver Summary

Most pollutants emitted by rail are risk drivers for the PATS study area as a whole, but the pollutants causing at least 10% of the risk within this category are 15 PAH and diesel particulate.

The target reductions for railroads are 15 PAH 96% and diesel particulate 92%.

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

Rail yard idling is the most concentrated source of rail emissions in the PATS area. Potential strategies to minimize it include auxiliary power units, use of traction slugs, repowering locomotives, encouraging the use of engines configured with common rail fuel distribution systems, gensets, and hybrid yard engines.

However, idling diesel engines require low fuel levels, resulting in fewer emissions than working engines. The repowering, common rail, genset, hybrid and fuel-cell options offer reduced emissions when an engine is working as well as at idle, thus improving emission reductions and fuel usage more than idle reduction techniques alone.

5) Matrix

The matrix in Table 32 summarizes information for potential strategies to reduce emissions from railroads.

Table 32: Core Evaluation of Railroad Strategies

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Common Rail Diesel System	10 ^a (PAH, Diesel PM)	Immediately available technology.	Currently feasible. Can be implemen ted during engine repower.	\$400,000 retrofit/locomotive
#2: Genset Yard Locomotives	35-50 ^{b,c} (PAH, Diesel PM)	Immediately available technology.	Currently feasible.	\$600,000 – 1.2 million/retrofit locomotive
#3: Hybrid Yard Locomotives	35-60 ^{b,c} (PAH, Diesel PM)	Immediately available technology.	Currently feasible.	\$750,000 million/locomotive
#4: Fuel Cell Powered	~100 ^{b,d} (PAH, Diesel PM)	Commercial ization of	Under developme	\$6 million/ locomotive

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
Locomotive		strategy unknown.	nt.	
#5: Emission Capture and Control	19 ^b (PAH, Diesel PM)	Immediately available technology.	Currently feasible.	\$2 million per yard
#6: APUs/Anti-idling Strategies	17 ^b (PAH, Diesel PM)	Immediately available technology.	Currently feasible.	\$27,500 to retrofit/locomotive
#7: Switcher Engine Repowering	10-60 ^{b,c} (PAH, Diesel PM)	Immediately available technology.	Currently feasible.	\$400,000 retrofit/locomotive
#8: Early Retirement of Older Engines	10-60 ^{b,c} (PAH, Diesel PM)	Immediately available technology.	Currently feasible.	\$2 million/locomotive
#9: Preventative Maintenance	Unknown	Immediately available technology.	Currently feasible.	\$2 million/locomotive
#10: Alternative Fuels – Biodiesel	12 ^{a,e} (PAH, Diesel PM)	Immediately available technology.	May require separate fuel tank and fueling system.	No retrofit cost, but fuel provides 10% less power, so efficiency is reduced.
#11: Alternative Fuels – Natural Gas	50 ^a (PAH, Diesel PM)	Immediately available technology.	CNG applicable for yard operations.	\$400,000 for retrofit/locomotive
#12: Encourage more Freight by Rail	Unknown	Immediately available technology.		
#13: Rail Efficiency Measures	Varies	Immediately available technology.		Varies

^a Percent emission reductions applicable for line haul and yard operations.

^b Percent emission reductions applicable for yard operations only.

^c Emission reductions calculated using midpoint of range.

^d 98% reduction assumed for fuel cell powered locomotives.

^e Emission reductions applicable only for metal species.

6) Assumptions and Limitations

The rail strategies require changes in the locomotive fleet and operations, necessitating cooperation of the railroad companies that operate in the PATS area. Often this requires financial incentives to encourage implementation of these practices. In order to provide such incentives, Oregon would be competing with states such as Texas and California that offer very generous incentives – often fully covering the purchase price of new engines and locomotives, making many of the options in this section very costly to support.

Because locomotive emission sources are highly movable, it is sometimes a challenge to set up incentive programs or policies that encourage the application of technological controls. For example, if a control is installed on a specific locomotive and that locomotive leaves the PATS area, then the emission reduction associated with that locomotive is lost. Because yard locomotives are more likely to stay in the PATS area, strategies involving this type of equipment would likely be the most effective strategy.

The data quality for rail was rated B (very good) for high volume areas and C (good) for low volume areas.

7) PATSAC member feedback

- Measures should be keyed to the fact that over 40% of rail line-haul activity through Portland does not stop.
- Emissions reductions should be updated to include capture of arsenic.
- Consider other measures including potential indirect mobile source rule in Spokane, possible alignment of bikeways with rail lines for emission mitigation.
- Fuel cell technology is not yet available.

7.2.9 Unpermitted Industrial Fuel Use

1) Unpermitted Industrial Fuel Use Description

The unpermitted industrial fuel use source category is comprised of four fuel-specific subcategories: natural gas, distillate fuel oil, residual oil, and other fuels (i.e., waste oil and kerosene). Unpermitted industrial fuel use emissions are primarily from distillate fuel oil; emissions from the natural gas, residual oil and other fuel subcategories are comparatively small. More than 80% of hazardous air pollutant emissions from this source category are from distillate oil combustion. Therefore, emission reduction strategies focus on distillate oil combustion units. The combustion units in this category could either be external (for example, boilers or heaters) or internal (for example engines or generators).

2) Pollutant Risk Driver Summary

Diesel PM is the main risk driver for this category. **The target reduction for Diesel particulate matter (PM) from unpermitted industrial fuel use is 92%.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

Control strategies include switching from distillate oil to cleaner fuels such as biodiesel or natural gas, installing add-on PM control devices such as fabric filters, and lowering the PM emission limits for engines.

5) Matrix

The matrix in Table 33 summarizes information in four core areas for potential strategies to reduce emissions from unpermitted industrial fuel use.

Table 33: Core Evaluation of Unpermitted Industrial Fuel Use Strategies

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Fuel switching - Biodiesel	55% (diesel PM)	Immediate	Feasible	Not calculated
#2: Fuel switching – Natural Gas	28% (diesel PM)	Immediate	Feasible	Not calculated
#3: Add-on PM Control Devices	80% (diesel PM)	Immediate	Feasible, dependent on engine	\$80-\$40,000 per device, dependent on the size of the engine.
#4: More Stringent PM Emission Limits	Depends on emission limit (diesel PM)	2-3 years, depending on rule making	Feasible	Cost of regulation

** There is a **gap of 12%** between the target reductions for risk driver pollutant for this source category and the reductions achievable if Strategy #3 was applied in the PATS area.*

6) Assumptions and Limitations

A limitation on implementing Strategy #1 is the supply of biodiesel in the PATS area. Replacing the existing distillate oil-fired units with natural gas-fired units (Strategy #2) may have a high capital cost. Converting the existing distillate oil-fired units to dual fuel combustion units (i.e., using both diesel and natural gas) is more cost-effective.

There is a 12% gap between the target reduction for the risk driver pollutant for this source category, if Strategy #3 were applied to every oil-fired unit in the PATS area. It is unlikely that these strategies could be applied to each instance of industrial fuel use in the PATS area.

The data quality for the unpermitted industrial fuel use source category was rated D (Acceptable).

7) PATSAC Member Feedback

- There were no additional responses in this category.

7. 2.10 Asphalt Use (non-permitted)

1) Asphalt (non-permitted) Description

Asphalt area source emissions inventory captures emission from solvent evaporation through non-permitted production and use of paving and roofing asphalt. Asphalt is used to pave, seal, and repair surfaces such as roads, parking lots, drives, walkways, and airport runways. Asphalt concrete is grouped into three general categories: hot mix, cutback, and emulsified. Because emissions from hot mix asphalt are low it is excluded from the emissions inventory. Emulsified asphalt is used in most of the same applications as cutback asphalts but is a lower emitting, energy saving, and safer alternative to the cutback asphalts (Moulthrop, et al. 1997). Since emulsified asphalt is used significantly more than cutback asphalt, emissions from emulsified asphalt account for 95% emissions from asphalt source category.

2) Pollutant risk driver summary

Asphalt use is a source of volatile organic compound (VOC) emissions. One of the toxic VOCs is naphthalene, which is the only PATS air toxic of concern for non-permitted asphalt category. **The target reduction for naphthalene from asphalt (non-permitted) is 88%.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

The evaluated strategy considers lowering the VOC standards for all emulsified asphalt types. The reduction targets for naphthalene emissions from asphalt paving could be closely approached if the use of emulsified asphalt is limited to that which contains 0.5 mL or less of oil distillate from a 200 mL sample (as determined using American Society for Testing and Materials (ASTM) Method D244 – Test Methods for Emulsified Asphalts) regardless of application. This is equivalent to a VOC content of 0.25 percent (reduced from average 6% allowable VOC content).

5) Matrix

The matrix in Table 34 summarizes information for a potential strategy to reduce emissions from asphalt.

Table 34: Core Evaluation of Asphalt Strategies

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Lower VOC standards for all emulsified asphalt types	77% (naphthalene)	1-3 years	Feasible	Cost of regulation

*There is a **gap of 11%** between the target reductions for risk driver pollutants for this source category and the reductions achievable*

6) Assumptions and Limitations

The risk from this source category is area-wide, although emissions may be higher in localized impact areas near the asphalt paving activities. Strategy #1 (Lower VOC standards) is technically feasible, and is based on technical analysis done by the Ozone Transportation Commission.² Lower VOC alternatives are currently available. Regulatory authority for DEQ or local government would need to be evaluated. Three strategies (numbers 2-4) suggested at the 4/14/2011 PATSAC meeting have not yet been evaluated. The data quality for the asphalt source category was rated D (acceptable).

7) PATSAC member feedback

- Include additional emission reduction strategies– reduce studded tire use so paving would need to occur less often, require same VOC limit on seal coats as for asphalt paving (perhaps same for roofing and for roof shingle manufacturing).
- Consider warm asphalt and increase use of permeable/porous pavement.
- Consider the use of concrete as an alternative road surface material.

7. 2.11 Miscellaneous (Publicly Owned Treatment Works, Landfills, and Restaurants)

1) Miscellaneous (Publicly Owned Treatment Works, Landfills, and Restaurants) Description

Miscellaneous sources include landfills, restaurants, and Publicly Owned Treatment Works³ (POTWs). Emissions from landfills and POTWs include off-gassing of hazardous air pollutants from waste, not from any specific operations or product use at the facility. In the PATS study area, there are less than 20 POTWs. There

² The Ozone Transport Commission (OTC) is a multi-state organization created under the Clean Air Act (CAA). The OTC is responsible for advising the Environmental Protection Agency on transport issues and for developing and implementing regional solutions to the ground-level ozone problems.

³ Wastewater treatment plants

are no active municipal landfills in the PATS study area although there are a number of closed sites, and one active landfill that takes only construction and demolition debris. There are thousands of restaurants in the Portland metro area. Restaurants emissions usually come from baking or frying and emissions are most often exhausted through a chimney or stack. Emissions are not regulated by DEQ, and vary greatly from one establishment to the next.

2) Pollutant Risk Driver Summary

The contribution of landfills, POTWs and restaurants to Ambient Benchmark Concentration exceedances is minimal.

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

Consumer education could be an effective strategy for reducing emissions from Publicly Owned Treatment Works. This is a pollution prevention strategy. This strategy could effectively reduce or eliminate pollutants from the water, reduce organic material and other (illegal) dumping.

Restaurant emissions are exempt from current permitting rules. Rules could be changed to include them. Outreach and education could also be an effective strategy for reducing restaurant emissions by encouraging owners/operators to voluntarily install afterburner type technology to their current stacks. Participation could be encouraged by creating a restaurant category in the EcoBiz program or with incentives such as a grant program or tax credit.

5) Matrix

The matrix in Table 35 summarizes information for potential strategies to reduce emissions from POTWs, landfills and restaurants.

Table 35: Core Evaluation of POTW, Landfill, and Restaurant Strategies

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Outreach and Education	Unknown	1-10 years	Feasible	Cost of staffing
#2: Rule change/ incentives/ EcoBiz for restaurants	Unknown	1-10 years	Feasible	Cost of incentive/ regulation / Ecobiz.

** There is **an unknown gap** between the target reductions for risk driver pollutants for this source category and the reductions achievable based on strategies where emission reductions have been quantified.*

6) Assumptions and Limitations

The distribution of emissions is area wide with potential localized impact areas. DEQ has had some experience with local impacts of specific restaurants and control strategies can include simple stack extensions, or process modifications to reduce smoke impacts. These strategies may affect annoying or nuisance conditions for neighbors, but only move the pollution elsewhere. Installing afterburners on restaurant stacks would reduce odorous VOC emissions, some of which may be hazardous air pollutants, but could increase other pollution. Afterburners require heat, so fuel is required to make the process work; as such, CO or CO₂ and NO_x emissions could increase. Regulatory authority for a rule change under Strategy #2 would need to be evaluated. Data quality rating for landfills and POTWs are both A (excellent); and for restaurants is D (acceptable).

7) PATSAC Member Feedback

- Better understand area wide as opposed to localized impacts of sources in this category. For example, a landfill or POTWs could be significantly affecting its neighbors while not contributing significantly to total area wide concentrations.
- Further review low-cost strategies and their impacts.
- Improve the source category organization. Restaurants, landfills, and POTWs should be separate categories.
- Add a strategy to deal with closed landfills.
- Include outdoor BBQs in the analysis.

7.3 Point Source Emission Source Categories⁴

7.3.1 Asphalt Roofing Manufacturing

1) Asphalt Roofing Manufacturing Description

The asphalt roofing manufacturing source category consists of facilities that use a fibrous substrate and processed asphalt to manufacture roofing products. Facilities in this source category may manufacture shingles, laminated shingles, mineral-surfaced roll roofing, or saturated felt roll roofing. Asphalt roofing facilities may also have co-located asphalt processing operations, such as asphalt blowing stills, that prepare the raw asphalt material for application to the substrate.

2) Pollutant Risk Driver Summary

Asphalt roofing manufacturing facilities emit pollutants that drive risk in the PATS study area. However, those pollutants emitted by asphalt roofing manufacturing facilities, such as benzene, only contribute to risk in their immediate vicinity. **The target reduction for benzene from asphalt roofing manufacturing is 91%.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

The strategy evaluated for asphalt roofing manufacturing is the establishment of emission standards for benzene, PAH and formaldehyde. Currently, PM emission limits for process emissions are in place at facilities in this source category. Sources are typically able to meet these limits using PM control devices, such as high-efficiency fiber bed filters. The evaluated control strategy would replace filtration-type PM control devices with thermal oxidation of the process vent streams as the control for not only PM, but also vapor-phase organic HAP emissions.

5) Matrix

The matrix in Table 36 summarizes information for a potential strategy to reduce emissions from Asphalt Roofing Manufacturing.

⁴ Point Source emission source categories are in alphabetical order as opposed to level of cumulative risk as seen with area/mobile in Section 7.2 .

Table 36: Core Evaluation of Asphalt Roofing Manufacturing Strategies

Framework Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Emission standards	95% (benzene)	5-10 years	Feasible	Cost of regulation. Major source NESHAP evaluation estimates a cost-effectiveness of thermal oxidation is on the order of \$559,000 per ton of HAP reduced

** There is a gap of 0% between the target reductions for the risk driver pollutant for this source category and the reductions achievable.*

6) Assumptions and Limitations

Thermal oxidation is the only technically available new emission reduction measure available that can be evaluated for this source category. The technology is available, but is only required of major sources of HAP emissions in this source category. The sources in the PATS area are minor sources and are not subject to the major source NESHAP requirements.

This control strategy could be implemented as a regulatory requirement in addition to those currently required in state and federal regulations. As there are no current regulations that require thermal oxidation for the existing sources, a strategy would need to provide ample time to consider regulations and for sources to investigate control strategies, purchase equipment, and perform installation and break-in of new control equipment.

In practice, the emission reductions would likely be less than 95 percent, since capture and control of all of the anticipated emissions may not be possible (i.e., depending upon the collection efficiency). The data quality for asphalt roofing manufacturing was rated A (Excellent).

7) PATSAC Member Feedback

- The white paper should include a strategy to reduce the demand for asphalt roofing.
- Review the use of filters or thermal oxidizers on asphalt storage tanks as a means for emission reductions.
- Consider co-control of VOCs for ozone benefit.

7.3.2 Bulk Terminals

1) Bulk Terminals Description

Petroleum products are delivered by pipeline or marine vessel to a bulk terminal facility. At the bulk terminal facility the products are stored, blended and then delivered to another transfer point (e.g., bulk gasoline plant) or end consumer using railcars, barges, or tank trucks. Emissions from the bulk terminal source category are from loading operations, the storage of products, and the equipment leaks from sources such as pumps, valves, and flanges.

2) Pollutant Risk Driver Summary

Bulk terminals emit pollutants that drive risk in the PATS study area. However, those pollutants emitted by bulk terminals, such as benzene, only contribute significantly to risk in their immediate vicinity. **The target reduction for benzene from bulk terminals is 78 to 93%, depending on the specific facility.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

The bulk gasoline terminals in the PATS area have several applicable regulations covering VOC or HAP emissions. Most of these rules specifically cover gasoline storage or loading. The strategies evaluated include controlling the storage or loading of non-gasoline materials and controlling emissions to a greater extent than what would be controlled by the existing rule.

5) Matrix

The matrix in Table 37 summarizes information for potential strategies to reduce emissions from bulk terminals.

Table 37: Core Evaluation of Bulk Terminal Strategies

Framework Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Standards for vapor loss during storage	10-23% (benzene)	3-5 years	Feasible	\$75,000 for unit upgrade or \$223,000 for new unit
#2: Leak detection and repair	0.4% (benzene)	2-3 years	Feasible	\$1030 per monitoring event

** There is a gap of 59 to 70% between the target reductions for risk driver pollutants for this source category and the reductions achievable*

6) Assumptions and Limitations

Current standards for vapor loss during storage require that emissions from the loading of gasoline are limited to 80 mg TOC/l by the State rule and by the NESHAP (subpart BBBBBB). For sources that are currently meeting the 80 mg TOC/l emission limit, limiting the gasoline loading emissions to <10 mg TOC/l would provide an 88% emission reduction for all PATS pollutants. Revising the state rule to incorporate this new limit would likely take 1 to 2 years to adopt and 2 to 3 years for the source compliance.

The NESHAP (Subpart BBBBBB) requires leak detection and repair monitoring using “sight, sound, and smell.” This type of program, without the use of a TOC monitor, has limited effectiveness. The emission reduction potential for equipment leaks is relatively high for a leak detection and repair program where no monitoring is currently being performed. However, the emissions from equipment leaks are very small from bulk terminals. Five of the seven PATS area terminals have equipment leak emissions of 0.3 to 2.9 tons per year of VOC and a total from the five terminals of 6.4 tons of VOC. Assuming 0.27% for benzene content of gasoline, the greatest amount of benzene emissions available to be reduced is 35 pounds. A more in-depth review of emissions from the seven bulk terminals would be necessary if this control strategy was considered further. These strategies could be applied area-wide or could be targeted to sub-regions.

The data quality for the bulk terminals source category was rated A (Excellent).

7) PATSAC Member Feedback

- Two measures for standards for vapor loss during storage yield different reductions while the other considerations are identical. There is a recommendation to select the 10mg/L limit if the framework level strategy is chosen.

- Determine if Kinder Morgan should be added to the terminals and identify if subsequent additional reductions would be achievable with the evaluated strategies.
- Review controls for barge lightering (out gassing) in Oregon and Washington.
- Review “grandfather” clauses for floating roofs at older facilities.
- Review controls of emissions from venting upon tank clean-up.
- Review whether the leak detection strategy will pay for itself.
- Co-control VOCs for ozone benefit.

7.3.3 Glass Manufacturing

1) Glass Manufacturing Description

The products of the glass manufacturing industry are flat glass, container glass, and pressed and blown glass. Glass manufacturing of containers includes the following operations: raw material and cullet receiving and storage, materials blending and transport, glass melting furnaces, glass forming, final bottle treatment, and maintenance and support systems such as the boiler, heaters and storage tanks. The procedures for manufacturing other glass products are the same except they do not include forming and finishing.

2) Pollutant Risk Driver Summary

Glass manufacturing facilities emit pollutants that drive risk in the PATS study area. However, those pollutants emitted by glass manufacturing facilities, such as arsenic, only contribute to risk in their immediate vicinity.

The target reduction for arsenic from glass manufacturing is 71%.

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

The glass manufacturing facility in the PATS area has several applicable regulations covering PM emissions. Most of these rules specifically cover glass melting furnaces. The strategy that was evaluated at the blueprint level focuses on emissions standards. This strategy reviews the required use of high-energy venturi scrubbers or electrostatic precipitators in combination with collection hoods to further control particulate emissions from molten glass.

5) Matrix

The matrix in Table 38 summarizes information for a potential strategy to reduce emissions from glass manufacturing.

Table 38: Core Evaluation of Glass Manufacturing Strategies

Framework Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Emission Standards	72% (As)	1-2 years	Feasible	Capital costs of \$0.6 to \$1.8M, with annual costs of about \$0.5M

** There is a gap of 0 % between the target reductions for the risk driver pollutant for this source category and the reductions achievable.*

6) Assumptions and Limitations

The risk for this source category is local. With respect to facilities contributing to benchmark exceedances, glass manufacturing accounts for roughly 22% of arsenic emissions for all industrial facilities based on the PATS 2017 projected emissions inventory and modeling studies. The white paper evaluation for glass manufacturing

was performed by DEQ. It was compiled after the committee review process and did not receive the same level of committee evaluation.

The data quality for the glass manufacturing source category was rated A (Excellent).

7) PATSAC Member Feedback

- There was no PATSAC feedback on this white paper.

7.3.4 Metals Facilities

1) Metals Facilities Description

The permitted metals facilities source category is comprised of two subcategories, which are electroplating and metals production. The electroplating subcategory includes hard chromium electroplating, decorative chromium electroplating, zinc galvanizing, and cadmium electroplating. The metals production subcategory includes primary steel production, secondary grey iron production, and secondary steel production.

2) Pollutant Risk Driver Summary

Metals facilities emit four pollutants that drive risk in the PATS study area. For all source sectors, metals facilities account for 100% of the manganese, nickel, lead, and 63% of the cadmium in projected 2017 emissions that contribute to benchmark exceedances. Other pollutants emitted by the metals facilities, such as arsenic, benzene, hexavalent chromium, and naphthalene may be potential risk drivers in their immediate vicinity. **The target reductions for metals facilities are: 39 to 91% for manganese, 72% for nickel, 49% for lead, 1 to 95% for chromium, and 94 to 96% for cadmium, depending on the specific facility.**

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to the [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

DEQ has evaluated a total of six reduction strategies for the permitted metals facilities source category. For electroplating facilities, DEQ evaluated three reduction strategies: housekeeping to focus on fugitive dust and chemical storage, fume suppressants as a wetting agent to reduce mist from plating baths, and HEPA filters as an air filtering device. For metals production facilities, DEQ evaluated three reduction strategies: more stringent emission capture requirements for steel foundries, process adjustments to reduce tap-to-tap time and electricity consumption, and incentives for utilizing vacuum casting for steel mills.

5) Matrix

The matrix in Table 39 summarizes information for potential strategies to reduce emissions from metals facilities.

Table 39: Core Evaluation of Metals Facility Strategies

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Housekeeping (hard chrome electroplating)	10% (Chromium VI)	Immediate	Feasible	\$1,315 (annual costs/facility), 12 applicable facilities
#2: Fume Suppressant (hard chrome electroplating)	21% (Cadmium)	3-5 years to unknown	Feasible	\$1,200 (annual costs/facility)

Brainstorm Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#3: HEPA Filters (hard chrome electroplating)	0.1% (Chromium VI), 21% (Cadmium)	Immediate	Feasible	\$40,000-\$270,000 depending on exhaust flow rate and existing on-site controls
#4: Improved PM capture (secondary metal production)	10% (Manganese, Cadmium, lead)	Significant – rules and upgrades	Feasible	Costs are highly variable depending on case-specific factors and can be significant
#5: Process adjustments for secondary metal production (secondary metal production)	Reduced energy demand will offset emissions associated with power generation	3-5+ years, can require permit approvals	Feasible	Costs can be estimated with melters capacity – see Table 14 in the metals facilities White Paper
#6: Incentive for utilizing vacuum casting for steel mills (secondary metal production)	Unknown	Unknown	Feasible	Unknown

** There is a gap of 89% for manganese, 49% for lead, 72% for nickel 84 to 74% for chromium, and 63 to 65% for cadmium between the target reductions for risk driver pollutants for this source category and the reductions achievable.*

6) Assumptions and Limitations

The risk for this source category is local. The emissions from metals facilities can be broken into two subcategories, hard chrome electroplating and secondary metal production. With respect to facilities contributing to benchmark exceedances, electroplating accounts for roughly 51% of cadmium and 1% of manganese, nickel, and lead emissions, whereas secondary metal production accounts for roughly 49% of cadmium and 99% of manganese, nickel, and lead emissions for all metals facilities based on the PATS 2017 projected emissions inventory and modeling studies.

The White Paper evaluation for metals facilities was performed by a contractor whose information gathering and evaluation method were performed utilizing facility permits and conversations with DEQ staff. There are aspects of the evaluation that have been questioned by committee members that will need follow up to ensure that the metrics associated with various strategies are accurate.

The data quality for the metals facilities source category was rated A (Excellent).

7) PATSAC Member Feedback

- A control strategy that might work at one facility may not apply at another. Care should be taken in writing the descriptions of the control strategies to be clear that they can not be applied universally
- The costs and benefits associated with emission control strategies will depend on the specific equipment and process being controlled and the facility where it is applied. What may be cost effective at one facility may not be technically feasible at another

- When an impact from an emission control strategy has been demonstrated, DEQ should work with individual facilities to develop strategies that will work at those sites
- Future strategies should not be constrained by DEQ resources.
- Review the possibility of asking industry what they can do instead of trying to suggest actions.
- Since potential strategies may fall short of achieving benchmark concentrations, reduction efforts should consider local impacts and work that will mitigate emissions for the highest risk populations.
- The vacuum casting process for metals affects organics.

7.3.5 Permitted Industrial Fuel Use

1) Industrial Fuel Use Description

The permitted industrial fuel use source category is comprised of four fuel-specific subcategories: natural gas, wood waste, distillate fuel oil, and other fuels (i.e., residual fuel oil, process gas, refinery fuel gas, and solid waste). The emission units from permitted industrial fuel use source category are comprised of external combustion units (such as boilers and heaters) and internal combustion units (such as engines and turbines).

2) Pollutant Risk Driver Summary

The uses of fuel at industrial facilities emit pollutants that drive risk in the PATS study area. However, those pollutants emitted by fuel use at industrial facilities, such as arsenic, benzene, cadmium and acrolein, may only contribute significantly to risk in their immediate vicinity.

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

The three strategies for the industrial fuel use source category that were evaluated include the following: fuel switching, add-on PM control devices, and more stringent emission limits.

- Fuel switching uses a cleaner burning fuel in place of the existing fuel.
- Add-on PM control devices reduce particulate matter and non-mercury metallic HAP emissions from industrial fuel combustion.
- More stringent emission limits for wood-fired boilers would require existing boilers to comply with the more stringent PM and CO emission limits established in NESHAP subparts DDDDD and JJJJJ for new/reconstructed units and for the units located at HAP major sources.

5) Matrix

The matrix in Table 40 summarizes information for potential strategies to reduce emissions from permitted industrial fuel use.

Table 40: Core Evaluation of Permitted Industrial Fuel Use Strategies

Framework Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Fuel switching	77% (acrolein) 89% (benzene) 6% (cadmium)	3-5 years	Readily available	Some capital cost would be required to modify the existing wood-fired boilers to accommodate the switch of fuel. In addition, there would be on-going costs associated with the purchasing of fuel.

Framework Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#2: Add-on PM control devices	1% (all pollutants)	3-5 years	Feasible	Capital, operation, maintenance, and stack testing costs
#3: More stringent emission limits	Depends on level of emission standards established	3-5 years	Feasible	Depends on level of emission standards established

** Some pollutants emitted by permitted industrial fuel use may be risk drivers for the PATS study area as a whole, but the facilities only contribute significantly to risk in their immediate vicinity.*

6) Assumptions and Limitations

Fuel switching, as an effective reduction measure, applies only to emissions from wood waste as a fuel source. The requirement of add-on PM control devices will only control PM species, such as arsenic, cadmium, chromium VI, diesel PM 2.5, lead, manganese, and nickel. Applying more stringent emission limits from NESHAPs will tend to impact both PM and VOC species.

It is a potential control option to have existing wood-fired boilers comply with the more stringent PM and CO emission limits established in NESHAP (subparts DDDDD and JJJJJ). However, this control option is only viable if the existing wood-fired boilers are located at HAP minor sources.

The data quality for the industrial fuel use source category was rated A (Excellent).

7) PATSAC Member Feedback

- Review and include the impact of EPA's new boiler Maximum Achievable Control Technology Rule in the White Paper and the 2017 emissions inventory and modeling.
- Consider reduction measure impacts to greenhouse gas emissions.
- Explore fuel switching as a strategy on the basis of the greatest emission reductions at a potentially lower cost.

7.3.6 Surface Coating

1) Surface Coating Description

The surface coating source category includes point source facilities that apply a material (such as paints, sealants, caulks, adhesives) to a substrate for decorative, protective, or functional purposes. The PATS study area includes sources performing paper coating, metal can coating, wood furniture coating, barge coating, rail car coating, heavy duty truck coating, and drum coating.

2) Pollutant Risk Driver Summary

Surface coating facilities emit pollutants that drive risk in the PATS study area. However, those pollutants emitted by surface coating facilities, such as naphthalene, only contribute to risk in their immediate vicinity.

The target reduction for naphthalene from surface coating is 74 to 86% depending on the specific facility.

3) List of Existing Emission Reduction Strategies

For a description of existing emission reduction strategies, please refer to [Appendix 12.9](#).

4) Summary of Potential New Emission Reduction Measures

DEQ has evaluated 14 brainstorm level strategies for reducing emissions from six different surface coating subcategories. The strategies are associated with the various application processes for surface coating. The 14 strategies are categorized at the blueprint level under the following three strategies: substituting lower emitting components, emissions standards, and improved application techniques.

5) Matrix

The matrix in Table 41 summarizes information for potential strategies to reduce emissions from surface coating.

Table 41: Core Evaluation of Surface Coating Strategies

Framework Level Strategy	Emission Reductions (risk driver pollutants)	Timeframe to reduce emissions	Technical feasibility	Cost
#1: Substitute lower emitting components	Rail/barge, drum, and metals parts coating: 100% (naphthalene)	1-2 years	Potentially feasible to Feasible, depending on sub-category	Low to significant based upon subcategory: Misc. metal parts coating – low cost
#2 Emission standards	Rail/barge and drum coating: 95-98% (naphthalene)	1-2 years	Feasible	Low to significant based upon subcategory: Rail/barge coating – \$100K/booth (thermal ox) + operational expenses
#3 Improved application techniques	Drum coating: 60% (naphthalene)	1-2 years	Feasible	Low cost (e.g., a few thousand dollars)

** Some pollutants emitted by surface coating facilities may be risk drivers for the PATS study area as a whole, but the facilities only contribute significantly to risk in their immediate vicinity.*

6) Assumptions and Limitations

The surface coating reduction measures focus on emission reductions from six separate types of surface coaters. The selection of any strategy evaluated would therefore focus on reductions for specific surface coating operations, as opposed to the entire inventory of surface coating facilities.

The single measure with the greatest impact on PATS HAP emissions for the surface coating source category would focus on a single facility that performs drum coating, which currently does not have any VOC or organic HAP controls. A single facility accounts for about 80 percent of the PATS HAP emissions from the surface coating source category in the inventory. Emissions from this facility could be reduced by about 95 percent through the installation and operation of a thermal oxidizer or similar device on the exhaust from the drum coating operation.

The data quality for surface coating was rated A (Excellent).

7) PATSAC Member Feedback

- Review the use of bio-filters as a reduction strategy.

- Review whether switching guns under improved application techniques provides a 60% reduction of naphthalene.
- Further review of applicable NESHAPs is needed for this source category.
- Drum coating is one area where it appears that technology has not been applied yet and may be an emission reduction opportunity.

7.3.7 Additional PATSAC Member Feedback on Point Sources

- In general for point sources (and potentially all source categories), technical feasibility, cost and other factors are often facility specific so organization by source categories and drawing conclusions on feasibility might simply be speculation.
- Point source categories need more in depth research for full understanding and stakeholder consideration.
- The cost and feasibility studies are often case studies from other regions that may not be comparable to Portland area point sources. Care should be taken in writing the descriptions of the control strategies to be clear that they cannot be applied universally
- What may be cost effective at one facility may not be technically feasible at another. Therefore, DEQ should not promote generalized emission control strategies but instead, when an impact has been demonstrated, DEQ should work with the individual facility to develop strategies that will work at that site.