Construction Exposure Profiles

Diesel Engine Exhaust

PROVINCIAL BUILDING & CONSTRUCTION TRADES COUNCIL OF ONTARIO

Diesel engine exhaust (DEE) is a mixture of gases and tiny particles, produced when diesel-burning engines are used. It is a significant respiratory health hazard in the construction industry and building trades. CAREX Canada estimates that 966,000 Canadian workers have been exposed to DEE at work.

Toxic substances found in DEE include carbon (soot), carbon monoxide, polycyclic aromatic hydrocarbons, metals, and fine particulate matter. The composition of DEE depends on several factors such as the type and condition of the diesel engine, type of fuel, and load on the engine. When gases and particulates in DEE reach the deepest part of the lungs, it may increase the risk of respiratory diseases, heart disease, and cancer.

Health Effects

- Lung Cancer
- Bladder Cancer

Symptoms of acute exposure include coughing; eyes, nose, and throat irritation; headaches; or nausea, and allergic reactions.

Exposure Sources and Construction Trades

The largest source of DEE is large diesel-burning engines used in heavy equipment, motor vehicles, and other construction equipment. Some examples include:

- Welding machines
- Generators
- Compressors
- Rough-terrain lift trucks
- Concrete trucks
- Packers
- Bobcats
- Cranes
- Front-end loaders
- Powered elevating work platforms
- Bucket trucks and aerial devices

Trades Exposed in Construction	Exposure Sources and Activities
Operating engineers, and heavy equipment mechanics and operators	• Operating large motor vehicles and heavy equipment with diesel-burning engines
Sheet metal workers, welding and flame cutting occupations	• Operating welding and flame cutting equipment powered by diesel-burning engines
General and specialized construction labourers	• Operating diesel-powered generators and compressors • Performing work activities in proximity to diesel-burning equipment

Increased Risk

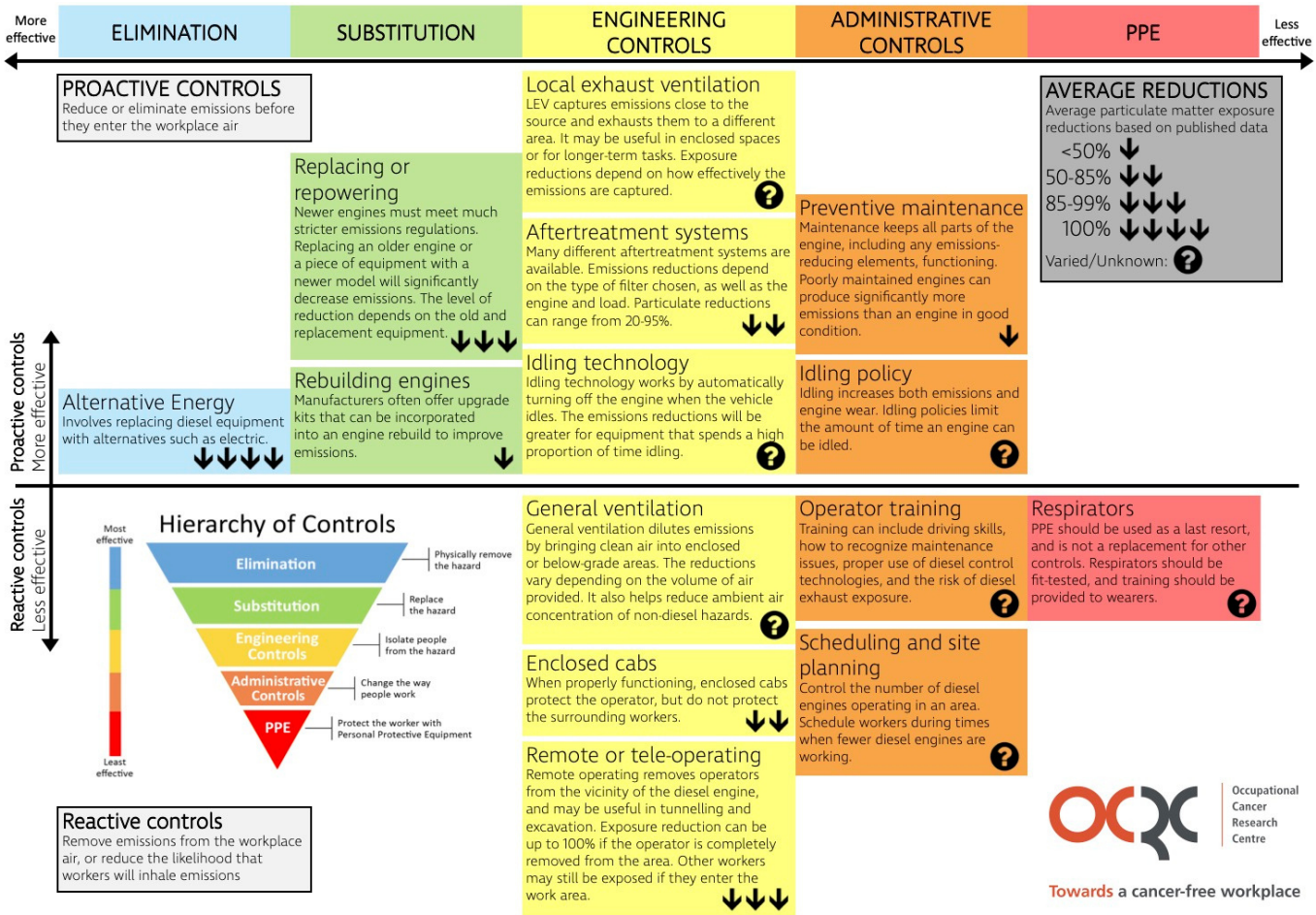
The Burden of Occupational Cancer Project estimates that almost 120 lung cancers and possibly 45 suspected bladder cancers diagnosed each year among Ontario construction workers are caused by exposure to DEE. The risk of lung cancer for workers in the construction industry is 1.09 times higher when compared to the general population in Ontario. The risk of bladder cancer for workers in the construction industry is 1.08 times higher compared to the general population in Ontario due to DEE exposure. According to the Future Burden of Cancer in Construction Project, Ontario construction workers exposed to DEE will experience an estimated 402 lung cancer cases over the period of 2030-2060 if there is no intervention [r].

The Occupational Disease Surveillance System (ODSS) has identified specific construction trades in Ontario as having the highest risks for lung and bladder cancer, when compared to all other workers in the ODSS, as shown in the following table.

Trade	Lung Cancer	Bladder Cancer
Occupations in labouring and other elemental work: electrical power, lighting and wire communications	8%	62%
Foremen/women: Excavating, grading, paving and related occupations	36%	29%
Plasterers and related occupations	20%	25%
Brick and stone masons and tile setters	10%	24%
Concrete finishers and related occupations	-	24%
Pipefitting, plumbing, and related occupations	8%	24%
Construction electricians and repairers	-	17%
Painters, paperhangers, and related occupations	39%	14%

Prevention

There is currently no occupational exposure limit for diesel engine exhaust that applies to the construction industry in Canada. Control strategies that may be effective in construction include:



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Occupational Cancer Research Centre

Provincial Building & Construction Trades Council of Ontario