



The NCEMBT has just released the Task 8 final report. In this Task residential air cleaners were investigated in the laboratory to assess their effectiveness in removing particulates and volatile organic compounds at the same time. The laboratory results were used to model the applicability of air cleaners to supplement or replace mechanical ventilation. The key findings are:

- a) Media filtration and electronic precipitation are two effective methods to remove indoor particulate contaminants. Four portable air cleaners claiming the use of HEPA filters were tested. None of them approached a removal efficiency of  $\geq 99.97\%$ . The measured efficiencies ranged from around 50% to 80%. Further investigation revealed that the frames allowed some air to by-pass the HEPA filters. This is a significant product design issue.
- b) One electronic precipitation and one ionizing were among the six portable units tested. Each both produced significant amount of ozone.
- c) Sorption and UV-photocatalytic oxidation are two effective methods to remove indoor VOC contaminants, although most of off-the-shelf products are based on sorption technology.
- d) An analysis was performed to compare the energy cost between ventilation and use of a portable air cleaner using the simple steady-state model. Two cities, Syracuse, NY and Chicago, IL, were selected for analysis. Results indicate that there are significant savings using the best available air cleaner to replace the mechanical ventilation if particulates, toluene (or VOCs with vapor pressure smaller than 150 mmHg) or formaldehyde were the target pollutants. However, even the best portable air cleaner tested costs more than mechanical ventilation to provide the same clean air exchange rate for dichloromethane due to the low removal efficiency. In general, an air cleaner would need to perform better than \$1.2/CADR (in Syracuse) or \$3.75/CADR (in Chicago) for a target pollutant to obtain the energy cost benefit compared with mechanical ventilation.