

## **CN Davies annual report 2015**

**by**

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Over the past year, I have been trained in using real-time optical particle counters and in performing air exchange rate testing using CO<sub>2</sub> as a tracer gas as well as other sampling techniques. I have developed a protocol to ensure that every house that I sample will have the same tests completed on them so as to guarantee repeatability and reproducibility of results. Since my last report, I have changed the type of homes that will be used in my study; the homes will now be those that undergo a retrofit to become more energy efficient. This allows me to monitor homes before and after a retrofit to assess the impact an energy efficient retrofit has on indoor aerosol pollution. The homes selected will now only be monitored during the heating season, this allows me to examine the worst case scenario for indoor aerosol pollution as the heating in the homes will be on and occupants are less likely to open the windows. The heating season is the period in which heating is required in the house, based on the outdoor temperature. The heating season in Ireland can start in mid-September and run through until mid-April, depending on outdoor temperatures. I have completed an extensive recruitment campaign to secure homes in a housing estate that will be retrofitted to the same standard. The retrofit will comprise of pump insulation, attic insulation, new windows and doors, as well as a boiler upgrade. The homes are three bed semi-detached houses and gas heated. The homes were selected using a strict criterion based on building type and type of retrofit. The homes will contain no smokers. In February, I will start to monitor 20 homes in a housing estate in a commuter town just outside Dublin.

In September, I attended the Air Infiltration and Ventilation Centre (AIVC) conference in Poznań, Poland. I completed a short oral presentation and poster presentation entitled "A protocol for assessing Indoor Air Quality in retrofitted energy efficient homes in Ireland". At the conference, I was able to meet other researchers in my area and to get feedback on what I plan to do. Over all, the reactions I got to my study was excellent, I have incorporated the comments into my protocol. The conference has paved the way for potential future collaborations with other researchers in my area.

In November, I attended the Fundamentals of Aerosol Science course in Birmingham. I found this course to be excellent; I gained a lot of practical knowledge on environmental sampling and electrical and optical properties of aerosols. I have recommended this course to other PhD students in my department. I also went to the Annual Aerosol Society Conference, where I presented a poster entitled "A protocol for assessing PM<sub>2.5</sub> in retrofitted energy efficient homes in Ireland". The poster detailed my approach to assessing PM<sub>2.5</sub> in homes, as well as the selection criteria for homes. I was able to meet with exhibitors which allowed me to learn more about the equipment that I use.