CIAQ
Federal Interagency
Committee on Indoor Air Quality

The next CIAQ Webinar/meeting will be held on **Wednesday, October 8th 2014**
www.epa.gov/iaq/ciaq
CIAQ@epa.gov

Webinar/meeting Attendance

Webinar/meeting duration: 195 minutes (1:00-4:15 PM)	Total attendance: 168 persons
Webinar registrations: 305 persons	Webinar attendance: 161 persons
Teleconference participants: 141 persons	In-person participants (room): 7 persons
Teleconference operator: Toni Simmons	Moderator: Phil Jalbert

~ A G E N D A ~

1:02 Welcome, introductions and announcements, *Phil Jalbert*
Brief announcements concerning the CIAQ Disclaimer; meeting agenda and minutes; EPA/CIAQ venue is relocating to Constitution Avenue; Department of Veteran's Affairs Joins CIAQ; FDA action on E-cigarettes; and, Greenwashing (ANSI pilot).

Updates on IAQ & IEQ activities from Federal CIAQ Member Agencies
1-NIST, National Institute of Standards and Technology, *Dr Andy Persily*
2-CPSC, Consumer Product Safety Commission, *Joanna Matheson*
3-HUD, Department of Housing and Urban Development
Healthy Housing and Lead Hazard Control, *Dr Peter Ashley*
Q&A on Agency Updates

4-DOE, Department of Energy, Building Technologies Program, *Chris Early*
5-GSA, General Services Administration, *Ken Sandler*
6-VA, Department of Veteran's Affairs, *James Symanski*
7-EPA, Environmental Protection Agency
Radon, Asthma, Science, Indoor airPLUS (IAP), Schools, Cookstoves
David Rowson (Director, Indoor Environments Division (IED))
Q&A on Agency Updates

Presentation: For details see Section 8/page 15 of these minutes.
"ASHRAE Standard 62.1: The IAQ Procedure and LEED", by Chris Muller, Purafil, Inc.
Answers to questions about the presentation are being developed and will be made available soon; look for a listserv announcement.

4:15 The Webinar/meeting was concluded.

~ M I N U T E S ~

Welcome, introductions and announcements, *Phil Jalbert, CIAQ Executive Secretary*

Disclaimer. A reminder to everyone that opinions expressed are solely those of the speaker. EPA and the Committee do not endorse services, entities or products that may be mentioned in the meeting. The full disclaimer can be found at the foot of today's Agenda.

Minutes. For those in the room, a note that the minutes may vary from the handouts due to late arriving information or changes.

Agenda. Today we have updates from seven (7) agencies and departments, and an interesting presentation from Chris Muller of Purafil, Inc. [Chris presented a very similar topic to the CIAQ at the June 2008 meeting]. In the Agency Updates section we'll have one or two short Q&A sessions, and another Q&A following the presentation. Toni, today's Operator, will instruct you on how to queue up for that when we get to that point.

EPA/CIAQ Relocating. EPA's 1310 L Street offices will be relocating to offices on Constitution Avenue in July/August. Details on the new CIAQ venue for the October 8th webinar-meeting will be posted to the listserv when available.

Veteran's Affairs Joins CIAQ. Please extend a welcome to James Symanski of the Department of Veterans Affairs (VA). The VA has joined the CIAQ and is present today for the first time. We have a brief update from James, who is a P.E., and the VA's Sustainable Design Program Manager.

E-cigarettes. As you know we have discussed the e-cigarette issue here at the CIAQ in the past. Recently, the FDA proposed a rule to bring e-cigarettes within their regulatory authority. Comments are due by July 9th; on how to submit comments, visit: http://www.regulations.gov/#!documentDetail;D=FDA-2014-N-0189-0001

Greenwashing. ANSI is piloting an accreditation program to help users determine which certification bodies and green labels are legitimate, a label-for-a-label program (to address greenwashing). For more information visit: http://www.ansi.org/news_publications/news_story.aspx?menuid=7&articleid=3867

Agency IEQ-IAQ Updates

1-NIST, National Institute of Standards and Technology

POC: Andy Persily (301.975.6418, andyp@nist.gov)

1.1-NIST Net-zero House: Instrumentation of the NIST Net-Zero Energy Residential Test Facility was completed last summer, with a year of monitoring in progress to verify that it indeed operates at net zero energy over one year. This two-story, four-bedroom house incorporates energy-efficient construction, space conditioning systems and appliances, as well as solar water heating and solar photovoltaics to meet the house's energy needs. In the area of IAQ, the house has a heat recovery ventilator sized to comply with ASHRAE Standard 62.2 and an extremely tight envelope, and was built with low-emitting building materials.

Measurements of indoor VOC and aldehyde concentrations started last summer and will continue through the summer of 2014 to verify that the material specifications meet the intended goals. Radon levels have been measured four times and are below the EPA action level of 4 pCi/L. Thermal comfort conditions are being continuously monitored in the house as well to confirm that the heating and cooling systems are maintaining comfortable conditions. An article on the IAQ specifications was recently published in the REHVA Journal in a special issue on net or near zero energy buildings, which can be downloaded at http://www.rehva.eu/publications-and-resources/hvac-journal/. For more information on the house in general, view the following video http://www.youtube.com/watch?v=xSzu83fyQaQ.

On June 30, 2014, the demonstration year will be complete. As of May 28, 2014, the house has consumed approximately 150 kWh more electrical energy than it has produced through the photovoltaic panels on the roof. This equates to a $20 energy bill over the course of 11 months. For daily updates, please visit http://www.nist.gov/el/nzertf/countdown.cfm as the countdown to net zero begins.
POC: Andy Persily (301.975.6418, andyp@nist.gov)

1.2-Improving the Reliability of Product Emissions Testing: The use of building materials with low VOC emissions may allow energy savings by lowering outdoor air ventilation requirements. Reference material development work to support the validation of product emissions testing has been focusing the production of toluene reference materials but is now shifting to formaldehyde emissions. In addition to the energy motivations for VOC reference materials, EPA has proposed rulemaking limiting formaldehyde emission from wood products.

To support improved labeling of low VOC products, NIST is developing a formaldehyde reference material with known contaminant emissions profiles to ensure correct determination of product emission rates. Improved data on the emission rates from materials and furnishings will be useful in low-energy building design and estimating occupant exposures. To that end, a formaldehyde reference material is being designed and constructed, and initial testing will commence soon. As part of this effort, the properties of the reference material and components will be examined for consistency and to ensure traceability of the final product. POC: Dustin Poppendieck (301.975.8423, dustin.popendieck@nist.gov)

1.3-Improved handling of infiltration in energy modeling: NIST has developed new methods to incorporate airflow calculations into building energy calculations, which are more accurate than current approaches and easier to apply. Current approaches include ignoring infiltration or assuming a fixed rate, which do not reflect known dependencies of infiltration on outdoor weather and heating, ventilating and air conditions (HVAC) system operation. The new strategies are based on a study of the relationships between infiltration rates calculated using multizone airflow models, weather conditions, and building characteristics, including envelope airtightness, and HVAC system operation. NIST Technical Note 1829 (http://dx.doi.org/10.6028/NIST.TN.1829) provides a detailed description of a building-specific and a generalized strategy for calculating infiltration in a commonly-used energy simulation tool, EnergyPlus.
POC: Lisa Ng (301.975.4853, lisa.ng@nist.gov)

1.4-ASHRAE: Standard 62.2 and IAQ 2013: The next meeting of the committee responsible for Standard 62.2 on residential ventilation and IAQ will be held June 27th and 28th in Seattle, where several proposed

changes to the standard will be discussed. One significant recent development includes proposals to change the scopes of Standards 62.2 and 62.1, which would move most residential dwelling units out of the scope of Standard 62.1 and into the scope of Standard 62.2. Currently, multifamily residential buildings of three stories or more are in the scope of Standard 62.1.
POC: Steven Emmerich (301.975.6459, steven.emmerich@nist.gov)

The ASHRAE IAQ 2013 conference with the theme Environmental Health in Low-Energy Buildings was held in Vancouver in October. The conference proceedings are available at the ASHRAE bookstore, http://www.techstreet.com/ashrae/products/1870896. A special issue of the HVAC&R Research Journal is being prepared that will contain several of the key papers from the conference. This issue is expected to be published later this calendar year. POC: Steven Emmerich (301.975.6459, steven.emmerich@nist.gov.

1.5-ASHRAE Standard 189.1: Efforts continue on updating and revising ASHRAE/USGBC/IES SSPC 189.1, Standard for High-Performance Green Buildings Except Low-Rise Residential Buildings. Current efforts are focusing on revisions that will be contained in the new version of the standard that will be published later this year. In the area of indoor environmental quality, the following addenda have recently been approved for publication: m, which adds lighting quality to the scope of the IEQ section and adds associated requirements; and r, which addresses ventilation in healthcare facilities.

Other IEQ-related addenda that are expected to be part of the 2014 standard are as follows: ae, VOC content of paints and coatings; ao, sealing of HVAC system filters; bn, requiring pre-occupancy ventilation; bx, addressing moisture control in the building envelope; and bz and cd, which both address outdoor contaminant entry from construction vehicles. More information on committee activities can be found on the ASHRAE website, where you can sign up for notifications of public reviews and other information at https://www.ashrae.org/resources--publications/free-resources/listserves.
POC: Andy Persily (301.975.6418, andyp@nist.gov).

1.6-ASTM: D22.05 Subcommittee on Indoor Air: ASTM D22.05 Subcommittee on Indoor Air met in Toronto in April and will meet again in October in New Orleans. Current activities within ASTM D22.05 include the development of standard methods for measuring spray polyurethane foam emissions using micro chambers. In next year efforts will be made to validate the proposed standards. A key issue with these standards yet to be resolved is the temperature at which SPF emissions testing should performed. In April 2015, there will be an ASTM symposium on SPF emissions at the ASTM meeting in Los Angles. Other current subcommittee work includes exposure scenarios for residential buildings and guidance on interpreting indoor carbon dioxide generation rates. More information regarding these efforts, as well as existing ASTM IAQ standards can be found at www.astm.org/COMMIT/SUBCOMMIT/D2205.htm.

2-CPSC, Consumer Product Safety Commission
POC: Joanna Matheson (301.987.2564, jmatheson@cpsc.gov)

2.1-Nano material studies: Interagency activities with NIOSH continue including evaluation of nano silver in consumer products. Additional interagency projects evaluating the presence and potential release of nanomaterials from consumer products are also continuing, including work at NIST

quantifying nanomaterial release from various matrices in the indoor environment, distinguishing engineered nanoparticles from those produced incidentally. Dr. Tinh Nguyen and Andy Persily are working on the NIST studies. POC: Treye Thomas (301.987.2560, tthomas@cpsc.gov)

2.2-Portable generator safety: The CPSC staff is developing a draft notice of proposed rulemaking for the Commission's consideration to reduce the risk of death and injury due to carbon monoxide (CO) poisoning caused by portable generators. As reported at the last CIAQ meeting, staff sent a letter on 1/14/14 to Underwriters Laboratories Inc. (UL) with staff's recommendations for requirements that could be used by a working group as a starting point for developing specific proposals for requirements in the voluntary standard UL 2201, *Portable Engine-Generator* Assemblies. The letter also requested that UL form the working group. The letter is available on CPSC's website at (http://www.cpsc.gov//Global/Regulations-Laws-and-Standards/Voluntary-Standards/Portable-Generators/CPSCstaffllettertoULdatedJan142014.pdf).

UL subsequently solicited for volunteers and formed a task group. The group held their first meeting on 5/13/2014. The task group is being chaired by Kevin Dunn, industrial hygienist with NIOSH, who was heavily involved in the successful effort that resulted in the EPA adopting a stringent CO emission standard for marine generator engines to address CO poisonings occurring on and around boats. POC Janet Buyer (301.987.2293, jbuyer@cpsc.gov)

2.3-Spray Polyurethane Foam (SPF) activities: EPA established a multi-agency work group to address several issues relating to SPF emissions. The agencies have received complaints regarding health effects including severe respiratory irritation, breathing difficulties, dizziness and nausea, resulting from the installation of SPF in homes. The work group has been working with industry on addressing issues such as the availability of consistent and accurate hazard communication on diisocyanates and other chemicals in the SPF insulation products; implementation of best practices that protect spray applicators, others in the work site, and occupants of residences, schools and other buildings; accurate marketing claims, and outlining of data gaps.

There are work items (ASTM WK40293, WK40292, and WK43872) under the ASTM Air Quality/Indoor Air (D22.05) subcommittee to measure emissions from these SPF products. An ASTM standard (ASTM D7859 - 13e1) was recently accepted under this work item involving spraying, sampling, packaging, and test specimen preparation of SPF insulation for testing of emissions using environmental chambers. CPSC contracted with Versar, Inc to produce a toxicological profile of select amine catalysts commonly found in SPF (**http://www.cpsc.gov/PageFiles/129845/amine.pdf**). Information from this report suggests that amine emissions may be the cause of these long term health effects. An interagency agreement was signed with NIST to conduct chamber testing of SPF samples. The study is to develop methods that will characterize and quantify releases of amines, isocyanates and other compounds.
POCs: Treye Thomas (301.987.2560, tthomas@cpsc.gov); Melanie Biggs (301-987-2593, mbiggs@cpsc.gov)

2.4-NSF/UL 440 – Health-based VOC Emissions Standard (Voluntary) for Building Products and Interior Furnishings: CPSC staff had been providing technical assistance on a monthly basis to both the Toxicology and Environments/Products task groups. There hasn't been new activity with these task

groups since draft proposal language was distributed and some of the proposals were approved to be balloted by the Joint Committee. The proposals cover chemical VOCs and toxicology endpoints, modeling scenarios and associated parameters, and other topics of interest.
POC: Kent Carlson (301.987.2578, kcarlson@cpsc.gov)

2.5-Drywall Projects: CPSC has received 4,054 reports from residents in 45 states, the District of Columbia, American Samoa and Puerto Rico. The majority of the reports remain from consumers residing in the states of Alabama, Florida, Louisiana, Mississippi and Virginia. The work continues at ASTM (under ASTM C11) on a proposed standard regarding limiting drywall sulfur content. On 5/2/2014 the CDC/ATSDR released their "Health Consultation: Possible Health Implications from Exposure to Sulfur Gases Emitted from Chinese-Manufactured Drywall," report.

This report describes the modeling researchers used to estimate levels of sulfur compounds in indoor air of homes built with problem drywall and the possibility of adverse health effects. The report and associated documents can be found at: http://www.atsdr.cdc.gov/drywall/. All drywall reports and studies are found at the first tab "Interagency Drywall Investigation" on the CPSC drywall webpage: http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/Drywall/
POC: Joanna Matheson (301.987.2564, jmatheson@cpsc.gov)

3-HUD, Housing and Urban Development, Office of Healthy Homes and Lead Hazard Control
POC: Peter Ashley (Peter.j.Ashley@HUD.gov)

3.1-Lead Hazard Control Grant Notice of Funding Availability (NOFA) Published**:** The OLHCHH published the combined Lead-Based Paint Hazard Control (LBPHC) and Lead Hazard Reduction Demonstration (LHRD) for Fiscal Year 2014. Approximately $47 million is available under the LHC NOFA and $45 million under the LHRD NOFA. An additional $12 million is available for Healthy Homes Supplement Funding; this funding (maximum of approximately $400,000 per grantee) allows grantees to address indoor environmental hazards that cannot be addressed using lead hazard control funds; applications due by June 27th. POC: Michelle Miller (michelle.m.miller@hud.gov)

3.2-Healthy Homes and Lead Technical Studies Pre-Application NOFA Published: The OLHCHH published a pre-application NOFA for healthy homes (approximately $3M available) and lead (approximately $1M available) technical studies. Based on score, a subset of pre-applicants will be invited to submit full applications. The program funds research on a variety of topics related to the identification and control of lead and other key residential health and safety hazards, with a focus on low income housing. POC: Peter Ashley **(**peter.j.ashley@hud.gov)

3.3-HUD Funds for Mold Remediation in Tribal Communities: In fiscal year 2014, Congress for the first time appropriated $10,000,000 for the Indian Community Block Grant (ICDBG) program for mold remediation and prevention in tribal housing (Consolidated Appropriations Act, 2014 (P.L. 113-76). The remediation of mold has long been an eligible actively in the ICDBG program; this set-aside of funds will enable tribes to do more. Funds will be awarded in response to a Notice of Funding Availability (NOFA) which is expected to be posted in mid-June. Eligible tribes and tribal organizations will compete

on a national level for awards that are expected to be made in late September or early October. Tribes with the greatest need will receive priority for the funds.
POC: Roberta Youmans (roberta.l.youmans@hud.gov)

3.4-The 2014 National Healthy Homes Conference (NHHC): The third **National Healthy Homes Conference,** a collaboration of the U.S. Department of Housing and Urban Development, Rebuilding Together, HGTV and DIY Network, was held in Nashville, TN from May 28th – 30th, 2014. Approximately 1,100 individuals registered for the conference and 137 sessions were held during the conference. Presentations, including many related to indoor air quality/indoor environmental quality will be made available on the conference website.
POC: Michelle Miller (michelle.m.miller@hud.gov), Eric Hornbuckle (eric.w.hornbuckle@hud.gov)

3.5-National Healthy Housing Standard Released: On May 16th the National Center for Healthy Housing and the American Public Health Association released the "National Healthy Housing Standard" at the National Press Club in Washington, D.C. HUD Secretary Shaun Donovan addressed the audience at event. The Standard translates current public health knowledge into housing code parlance and can serve as a complement to the International Property Maintenance Code by providing a set of minimum performance standards for a "safe and healthy home". For some topics, "stretch provisions" are provided for property owners who want to exceed the minimum standard. Federal agency staff from the CDC, EPA, and HUD served on the Technical Review Work Group for the document.
National Center for Healthy Housing POC: Jane Malone (jmalone@nchh.org)

4-DOE, Department of Energy
POC: Chris Early (chris.early@ee.doe.gov, 202.589.0514)

4.1-Current Projects by the Lawrence Berkeley National Laboratory for the DOE Residential Buildings Research Program:
POC: Brett Singer (bcsinger@lbl.gov, 510.486.4779), Max Sherman (MHSherman@lbl.gov, 510.486.4022)

As part of our efforts to better understand the current state of kitchen ventilation in US Homes, our Indoor Environmental group has worked together with LBNL Public Affairs to develop and post an online survey on cooking and kitchen ventilation equipment and practices. Version 1.0 of the public survey is available here: http://indoorair.lbl.gov/range-hood-roundup.html. The web portal provides more background and info.

4.2-Recent *Reports* by DOE (and others) related to IAQ
4.2.1-*Pollutant exposures from unvented gas cooking burners: A simulation-based assessment for Southern California.* Logue JM, Klepeis NE, Lobscheid AB, Singer BC *Environmental Health Perspectives*. November, 2013 http://homes.lbl.gov/publications/pollutant-exposures-unvented-gas-cooking-burners-simulation-based-assessment-southern-c

Results: The simulation model estimates that in homes using natural gas combustion burners (NGCBs) without coincident use of venting range hoods, 62%, 9%, and 53% of occupants are routinely exposed to

NO2, CO, and HCHO levels that exceed acute health-based standards and guidelines. NGCB use increased the sample median of the highest simulated 1-hr indoor concentrations by 100, 3000, and 20 ppb for NO2, CO, and HCHO, respectively. Conclusions: Reducing pollutant exposures from NGCBs should be a public health priority. Simulation results suggest that regular use of even moderately effective venting range hoods would dramatically reduce the percentage of homes in which concentrations exceed health-based standards.

4.2.2-*10 Common Misconceptions About Combustion Safety, Home Energy Magazine*, by VI RAPP, BRETT SINGER and IAIN WALKER, February 28, 2014, http://www.homeenergy.org/show/article/id/1938/nav/indoorairquality

Summary: In the home performance industry, most standards require extensive testing to identify vented appliances that could backdraft and spill exhaust gases, particularly when homes are air-sealed. But how good are these tests at finding problems? And how real are the risks? In this article, we answer these questions by addressing ten common misconceptions about combustion safety.

4.2.3-*Investigation of formaldehyde and acetaldehyde sampling rate and ozone interference for passive deployment of Waters Sep-Pak XPoSure samplers*, 12/2013, Mullen, NA, Russell, ML, Lunden, MM, Singer, BC http://homes.lbl.gov/publications/investigation-formaldehyde-and-acetaldehyde-sampling-rate-and-ozone-interference-passiv. HUD, EPA, CEC, and DOE.

Summary: This study investigated formaldehyde and acetaldehyde passive sampling rates and ozone interference for the DNPH-based Waters Sep-Pak XPoSure sampler. Previous studies have shown that ozone interferes with active sampling by this cartridge. Our study included one laboratory and six field experiments conducted in Northern California homes. Passive sampling rates of 1.10 ± 0.09 and 0.86 ± 0.10 mL/min determined for formaldehyde and acetaldehyde are lower than previously reported. In a controlled laboratory experiment there were small, statistically insignificant impacts of subsequent ozone exposure on formaldehyde and acetaldehyde mass passively collected on the samplers. This sampler is inexpensive, easy to deploy and to transport by mail, and has a high sampling capacity when used passively; it is suitable for a wide-range of monitoring applications. However, the passive sampling rate remains in question given the internally consistent, but different results obtained in our study and the previous study.

4.2.4-*Intermittent Ventilation Energy Demands and Indoor Air Quality in Hot and Humid Climates*, March 2014, Diana E. Hun and Mark C. Jackson, Oak Ridge National Laboratory

Summary: In this research we examine if intermittent ventilation can outperform continuous ventilation. More specifically, our goals were to assess an occupancy-based ventilation schedule that was tailored to decrease exposure to indoor air pollutants, and a utility-based ventilation schedule that could lower energy use during peak-demand hours. Our approach involved conducting spring and summer experiments in an unoccupied test house in east Tennessee, where we used formaldehyde concentrations as an indicator of indoor air quality. More specifically, we evaluated the effect of the following

mechanical ventilation schedules per ASHRAE 62.2-2010 on indoor formaldehyde concentrations and energy use:

4.2.5-*Test Plan to Evaluate the Impact of Source Control Measures on Indoor Air Quality in High Performance Homes,* February, 2014; SH Widder, Pacific Northwest National Laboratory; BC Singer, R Maddalena, Lawrence Berkley National Laboratory

4.2.6-*Combustion Safety for Natural Draft Appliances through Appliance Zone Isolation.* J. Fitzgerald and D. Bohac, Center for Energy and Environment for the DOE Building America Program. June 2013, http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/measure_guide_combustion_safety_appliancezone.pdf

Summary: This Measure Guideline covers how to assess and carry out the isolation of natural draft combustion appliances from the conditioned space of low-rise residential buildings. It deals with combustion appliances located either within the living space in enclosed closets or side rooms or outside the living space in an adjacent area like an attic or garage. This subset of houses does not require comprehensive combustion safety tests and simplified prescriptive procedures can be used to address safety concerns. This allows residential contractors inexperienced in advanced combustion safety testing to effectively address combustion safety issues and allow retrofits, including air sealing and changes to distribution and ventilation systems, to proceed.

4.2.7-*Measurement-Based Evaluation of Installed Filtration System Performance in Single-Family Homes.* Chan WR and Singer BC., Lawrence Berkeley National Laboratory, Berkeley, CA. April 2014. http://eetd.lbl.gov/publications/measurement-based-evaluation-of-insta

Summary: Enhanced filtration technologies incorporated in various system designs are being installed in both new and existing U.S. residential buildings, and in some cases creating substantial new energy loads despite inconsistent effectiveness in reducing exposures. Research is needed to support guidance on effective technologies, system designs and controls. A key element of this research effort is the ability to quantify performance of filtration systems as installed in homes. This guide provides background information on the factors that impact filtration system performance and specific guidance on how to implement installed performance evaluations. The guide is intended to inform building scientists, healthy homes researchers, and practitioners interested in conducting an evaluation or understanding an evaluation performed by others.

4.2.8-*Energy impacts of effective range hood use for all U.S. residential cooking.* Logue JM and Singer BC. 2014b. *HVAC&R Research.* 20(2): 264-275. *LBNL report number pending.* http://www.tandfonline.com/doi/full/10.1080/10789669.2013.869104

Range hood use during residential cooking is essential to maintaining good indoor air quality. However, widespread use will impact the energy demand of the U.S. housing stock. This article describes a modeling study to determine site energy, source energy, and consumer costs for comprehensive range hood use. Range hoods performing at a level common to range hoods currently in U.S. homes would require 19–33 TWh (69–120 PJ) of site energy, 31–53 TWh (110–190 PJ) of source energy; and would cost consumers $1.2 to $2.1 billion (US$/2010) annually in the U.S. housing stock. The average household

would spend less than $15 annually. Reducing required airflow (e.g., with designs that promote better pollutant capture and have more energy saving potential, on average, than improving fan efficiency).

4.2.9-*Capture efficiency of cooking-related fine and ultrafine particles by residential exhaust hoods*. Lunden MM, Delp WW, Singer BC. *Indoor Air.* May 24, 2014. *LBNL report number pending.* http://onlinelibrary.wiley.com/enhanced/doi/10.1111/ina.12118/

Effective exhaust hoods can mitigate the indoor air quality impacts of pollutant emissions from residential cooking. This study reports capture efficiencies (CE) measured for cooking generated particles for scripted cooking procedures in a 121-m^3 chamber with kitchenette. Results indicate that CEs measured for burner CO_2 are not predictive of CEs of cooking-generated particles under all conditions, but they may be suitable to identify devices with CEs above 80% both for burner combustion products and for cooking-related particles.

4.2.10-*Addressing Kitchen Contaminants for Healthy, Low-Energy Homes.* Stratton JC and Singer BC. Lawrence Berkeley National Laboratory, Berkeley, CA. January 2014. LBNL-6547E. http://eetd.lbl.gov/publications/addressing-kitchen-contaminants-for-h EPA, HUD, DOE and CEC

This report identifies barriers to the widespread adoption of kitchen exhaust ventilation technologies and practice and proposes a suite of strategies to overcome these barriers. The recommendations have been vetted by a group of industry, regulatory, health, and research experts and stakeholders who convened for two web-based meetings and provided input and feedback to early drafts of this document.

The most fundamental barriers are:

(1) the common misconception, based on a sensory perception of risk, that kitchen exhaust when cooking is unnecessary; and, (2) the lack of a code requirement for kitchen ventilation in most US locations.

Highest priority objectives include the following:

(1) Raise awareness among the public and the building industry of the need to install and routinely use kitchen ventilation;

(2) Incorporate kitchen exhaust ventilation as a requirement of building codes and improve the mechanisms for code enforcement;

(3) Provide best practice product and use-behavior guidance to ventilation equipment purchasers and installers, and;

(4) Develop test methods and performance targets to advance development of high performance products. A specific, urgent need is the development of an over-the-range microwave that meets the airflow and sound requirements of ASHRAE Standard 62.2.

4.3-DOE Weatherization Assistance Program
POC: Jennifer Somers; Josh Olsen (joshua.olsen@ee.doe.gov); Shawn Green (shawn.green@go.doe.gov)
The National Evaluation report "Weatherization and Indoor Air Quality Measured impacts in single-family homes under the Weatherization Assistance Program" is complete. Release date is not scheduled.

5- GSA, General Services Administration, Office of Federal High Performance Green Buildings
POC: Ken Sandler (202.219.1121, ken.sandler@gsa.gov)

5.1-Workshop on Occupant Health**:** GSA's Office of Federal High-Performance Green Buildings (OFHPGB) is drafting a proposal with the National Academy of Sciences for a workshop to examine the risks to Federal building occupant health and well-being presented by classes of chemicals in building products, and what, if any, policy approaches may be needed in response. Once the proposal is developed, we will circulate it in search of other potential sponsors.
POC: Ken Sandler (ken.sandler@gsa.gov, 202.219.1121)

5.2-Demonstration Project. OFHPGB is scoping out a potential demonstration project that would examine measurable stress impacts of working in a GSA building under different indoor environmental conditions, following previous research at the Denver Federal Center that found differences in heart rate variability and salivary cortisol levels before and after a workplace upgrade.
POC: Dr. Judith Heerwagen (judith.heerwagen@gsa.gov; 206.522.0354)

6-VA-Department of Veterans Affairs
POC: James Symanski, P.E. (202.632.5522, James.Symanski@va.gov)

6.1-Sustainable Design Manual: The VA released its new Sustainable Design Manual in early May. The manual is available on the Sustainable Design page of VA's Technical Information Library (TIL) at http://www.cfm.va.gov/til/sustain.asp. The new manual contains several requirements related to Indoor Air Quality.

7-IED, Indoor Environments Division
POC: David Rowson, Director (202.343.9411, Rowson.Dave@epa.gov)
7.1-Radon**.** We continue to focus and invest in technical standards of practice for radon. Four consensus standards are out now for public comment: (1) multi-family mitigation; (2) school/large buildings measurement; (3) school/large building mitigation; and (4) device performance. EPA's investment in these standards will help fill critical technical gaps. We are also currently discussing with state and industry stakeholders the next standards we should focus on as a community of practice.

The Federal Radon Action Plan (FRAP) continues to be a priority and is the most significant commitment to date by the federal family to reduce the radon risk in homes and schools. Nearly 2/3 of the participating Agencies' FRAP commitments have been completed. The new HUD requirement issued in February 2013 to require testing and fixing in multifamily housing has clearly been a watershed event, and affected over 100K housing units in FY2013 alone.

We continue to work with state radon programs to establish a new shared data resource for collecting and housing radon testing data. We are collaborating with CDC's Environmental Health Tracking Network in this important effort.

We remain committed to strengthening the treatment of radon within state cancer control plans. We are collaborating with CDC on this effort also. It has been a central component of our numerous

radon stakeholder meetings planned and delivered by our Regional EPA offices this year in conjunction with their state radon program and industry members.

A new group has been formed to complement the Federal FRAP effort. In collaboration with the American Lung Association, a new NGO/private sector group launched an effort this past fall to engage key non-governmental and private sector organizations on radon risk reduction. They hope to parallel the FRAP approach and push the private sector for new ideas and commitments to take action.

Congress appropriated $8M for the state radon grant program in FY2014 and EPA's Regional offices are working to award those funds to the states and tribes.

7.2-Asthma Awareness Month: During May, EPA recognized with a social media campaign to encourage Americans to learn how asthma affects families and communities, and how environmental factors affect asthma. On May 1, EPA kicked-off Asthma Awareness Month with: a press release announcing the winners of the annual National Environmental Leadership in Asthma Management Awards (with a YouTube video of the Administrator embedded); a webinar entitled "Closing the Gap: Addressing Asthma Disparities in Schools" which had 513 participants; a Janet McCabe blog congratulating the winners; and a Twitter Chat with OAQPS, ORIA, ORD, CDC which resulted in 11 tweets a minute #asthma.

Throughout the month, daily content was posted to Facebook and Twitter, as well as additional blogs from OAQPS, and partnership programs representing innovative work at the University of Turabo in Puerto Rico and Boston Public Health Commission. On May 8, EPA participated in a Radio Media Tour, in partnership with the Ad Council, to raise asthma awareness and promote The Breathe Easies asthma media campaign. Tracey Mitchell (IED's certified asthma educator), Lina Younes (EPA's Office of Web Communications), and Christ Draft (Former NFL Linebacker and Founder of the Chris Draft Foundation) participated in 13 interviews resulting in 4.6 million listeners.

As part of the month-long event, EPA honored a health plan, health care provider and community-based asthma program with the 2014 National Environmental Leadership Award in Asthma Management to recognize their exceptional commitment to improving the lives of people with asthma. HUD and HHS representatives participated on the evaluation panel. The winners were featured in a webinar on May 20, 2014 which had 158 participants.

They were also presented their awards at the National Healthy Homes Conference in Nashville, May 28-30. EPA helped to design this conference with HUD and gave numerous presentations and hosted an exhibit booth. The health plan winner is Peach State Health Plan, Atlanta, GA; the Health care provider winner is Tufts Medical Center in Boston, MA; and the community-based program winner is Multnomah County Health Department from Portland, OR.

7.3-Recent Important Scientific Advances

7.3.1-EPA's Indoor Environments Division has an interagency agreement with the Department of Energy's Lawrence Berkeley National Lab to develop and disseminate information about the relationships between IAQ and people's health and productivity. Since 2006, several peer-reviewed

journal articles have been published based on analyses conducted under the interagency agreement, and a web site at LBNL disseminates the project's results including downloadable journal articles and information developed from literature reviews.

7.3.2-An article "Health Benefits of Particle Filtration" was recently published in the journal Indoor Air and major update to the project's web site was posted based on this journal article and other emerging literature. A major expansion of web site's section "Indoor Volatile Organic Compounds (VOCs) and Health" was also recently completed (www.iaqscience.lbl.gov).

7.3.3-*National Expenditures, Jobs, and Economic Growth Associated with Indoor Air Quality in the United States,* Journal of Environmental Health, May 2014.

This new analysis, commissioned by EPA/IED, was recently published in the Journal of Environmental Health, May 2014 edition. The analysis estimates that "the annual sale of IAQ products and services is valued at $18–$30 billion and is associated with approximately 150,000–250,000 current jobs". The article will be posted on the EPA website.

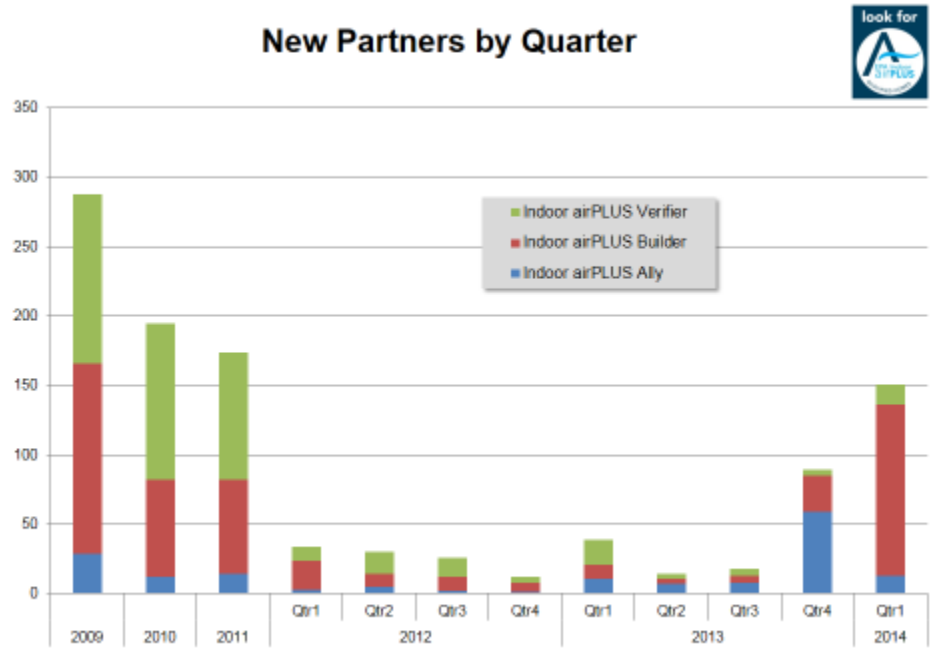
7.4-Indoor airPLUS

7.4.1-The 2nd revision to the Indoor airPLUS Construction Specifications was released to partners in November 2013. Revision 2 provides additional refinements to the specifications to encourage broader builder participation in the program.

7.4.2-The program continues to gain momentum, with 200 new builders joining the program since release of Revision 2 two months ago.

7.4.3-The last 4 quarters saw an almost 100% increase in homes labeled Indoor airPLUS though the total numbers are still a small fraction of the market.

7.4.4-The program is continuing to work closely with the ENERGY STAR Certified Homes program as well as DOE's Challenge Home program, which was recently re-named Zero Energy Ready Home (ZERH). DOE's recently revised program requirements now require the Indoor airPLUS label as a pre-requisite to receiving the ZERH label.



7.5-Healthy School Indoor Environments

7.5.1-*Energy Savings-Plus Health: IAQ Guidelines for School Building Upgrades:* EPA's Indoor Environments Division plans to release this new guidance document this summer. EPA developed this guide to protect and improve IAQ in schools during energy efficiency upgrades and other building renovation activities. Energy management and protection of IAQ should both be critical priorities for school facility management, and there can be a mistaken impression that the two goals are at odds with one another. In fact, when energy efficiency and IAQ protection goals are integrated and addressed holistically, schools can achieve strong results in both areas. An announcement will be provided via the CIAQ listserv when the new guide is available.

7.5.2-School Health and Indoor Environments Leadership Development (SHIELD) Summit: EPA's Indoor Environments Division is gathering the top leaders in the green and healthy schools movement to discuss and accelerate progress on indoor environmental health in schools to the 2014 School Health and Indoor Environments Leadership Development (SHIELD) Summit taking place on Thursday, June 19th in Washington, DC. Attendees will include non-governmental organizations, school district representatives with established, sustainable IAQ management programs, industry leaders, government agencies (federal and state level), and community-based asthma coalitions focused on schools and/or healthy indoor environments. For more information on the SHIELD Summit contact Michele Curreri at curreri.michele@epa.gov.

7.5.3-Healthy School Webinars: EPA has established a website that houses webinars that present technical solutions and resources to create healthy school environments and training materials for school

officials and staff about the importance of IAQ management. Access past technical webinars by visiting the IAQ Tools for Schools webinar archive at http://www.epa.gov/iaq/schools/webconferences.html.

The archive is a great resource to help school officials, stakeholders, and others learn how to better manage IAQ in schools and to hear the experts' responses to the questions asked during webinars. This information provides great insight about how to create and sustain comprehensive IAQ management programs in schools.

8-Presentation: ASHRAE Standard 62.1: The IAQ Procedure and LEED by Chris Muller (cmuller@purafil.com, 770.662.8545)

We had an interesting presentation on ASHRAE Standard 62.1: The IAQ Procedure and LEED, given by Chris Muller, ASHRAE Distinguished Lecturer (Technical Director, PURAFIL, Inc.). Chris' listserv announcement noted that the ability to achieve IAQ goals while reducing energy consumption is a valuable benefit to using ASHRAE Standard 62.1-2013, "Ventilation for Acceptable Indoor Air Quality". Meeting the requirements of the IAQ Procedure (IAQP), allows one to take credit for the application of validated air cleaning technologies and reduce the amount of ventilation air that has to be heated and/or cooled.

Revisions to Standard 62.1 have caused some confusion in the application of energy conservation measures. This confusion, coupled with a restriction on the use of the IAQP for use with the LEED building rating system, has prevented wider application of the IAQP. However, this may be changing due to the implementation of an IAQP pilot program offering an alternative compliance path for use with LEED-EB.

A performance methodology has been developed by the USGBC's IAQ Performance Testing Working Group (IAQP WG). The intent of the methodology is to establish minimum IAQ standards, based on the IAQP, for the comfort and well-being of occupants. The goal of this methodology is to create a compliance path for all related IEQ credits, including the Minimum IAQ Performance prerequisite. The working group has defined how the IAQP will fit into future versions of LEED for new construction and existing buildings.

The presentation: (1) discussed the current status of the Indoor Air Quality Procedure (IAQP); (2) reviewed the applicable provisions of the Standard for use with the LEED IAQP pilot program; (3) reviewed the indoor air quality models in use; and (4) gave examples of the IAQ Procedure's successful use in certifying LEED buildings. There was also be a discussion of current activities for making it easier to validate the IAQ Procedure and make it more useful to the engineering community.

Presentation Notes:
(a) Listen to the presentation and the Q&A session: ftp://scgguest7:scg611!@ftp.scgcorp.com
(right click to open the hyperlink)
This recording (42.2 MB) is only available for 30 days. Answers to questions about the presentation are being developed and will be made available soon; look for a listserv announcement.

(b) Presentations are available on the CIAQ website as PDF for a limited time; then by request via email to CIAQ@epagov.

(c) If you would like to present an IAQ or IEQ related topic to the Committee, please submit your presentation proposal to CIAQ@epa.gov.

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