February 14, 2018

CIAQ Meeting Minutes

Moderator: Laureen Burton, EPA

Meeting Overview

- Welcome, introductions and announcements
- Federal CIAQ Member Agency Updates - (Pages 2-17)
  - DOE-Department of Energy, Building Technologies Program — Page 2
  - NIST-National Institute of Standards and Technology — Page 6
  - CPSC-Consumer Product Safety Commission — Page 9
  - EPA-Environmental Protection Agency Indoor Environments Division (IED) — Page 12

Unable to attend this meeting:

- CDC-Centers for Disease Control (NIOSH)
- HUD-Department of Housing and Urban Development Office of Healthy Homes and Lead Hazard Control (OHHLHC)

- Presentations

Responses of Consumer Grade Monitors to Residential Sources of Fine Particulate Manner
Brett Singer, Indoor Environment Group Lead, Lawrence Berkeley National Laboratory

Responses of Consumer Grade Monitors to Residential Sources of Fine Particulate Manner
Linda Wigington, Team Leader, Reducing Outdoor Contaminants in Indoor Spaces (ROCIS)

- Post – meeting Updates and Announcements
  - Next CIAQ meeting is June 6, 2018 at 1pm

AGENCY UPDATES

DOE, Department of Energy. (POC: Chris Early, chris.early@ee.doe.gov, 202-586-0514)

- **DOE's Advanced Research Projects Agency-Energy (ARPA-E)** advances high-potential, high-impact energy technologies that are too early for private-sector investment. ARPA-E awardees are unique because they are developing entirely new ways to generate, store, and use energy. ARPA-E started a new program in November called: *SENSOR (Saving Energy Nationwide in Structures with Occupancy Recognition.)* The projects of ARPA-E's SENSOR program will develop user-transparent sensor systems that accurately quantify human presence to dramatically reduce energy use in commercial and residential buildings. Projects in the SENSOR program seek to reduce energy used by heating, ventilation, and air conditioning systems by 30% in both residential and commercial buildings. SENSOR projects will focus on one or more of four areas:
  - human occupancy sensors for residential use ($7.8 million),
  - occupant-counting sensors for commercial buildings,
  - CO2 sensors to enable the use of variable building ventilation based on data from occupant-counting sensors ($4.5 million), and
  - real-world testing and energy savings validation of these technologies.
  - You can find out more at: https://arpa-e.energy.gov/?q=arpa-e-programs/sensor.

- **Department of Energy's Health and Home Performance Initiative.** This DOE initiative will demonstrate associations between home performance services and health benefits leading to: expanded lead generation for qualified home improvement contractors, improved physician performance, increased homeowner accessibility for home performance services, and sustained positive health outcomes for consumers. Part of this DOE initiative is the upcoming conference: *2018 Health in Buildings for Today and Tomorrow: Making Connections*. An Interdisciplinary Conference on Health and the Sustainable Built Environment. July 19 – 20, 2018, Bethesda, MD. Sponsored by NIH, NSF, CDC, DOE, GSA, and following previous conferences organized by the *Health in Buildings Roundtable*, this event brings together the health and sustainable buildings communities to (i) define data resources and metrics for how the built environment impacts health, (ii) discover how sustainable building design, operation, and technologies can improve health outcomes, and (iii) identify outstanding research issues that remain unanswered. The conference will include two plenary sessions and four technical tracks.

  Conference organizers are looking for speaker nominations (including self-nominations). Limited travel support will be available through a grant from the *National Science Foundation.* Priority will be given to graduate students, junior researchers and faculty members, and underrepresented individuals.

  To register or get updates you can go here: https://www.eventbrite.com/e/save-the-date-2018-health-in-buildings-roundtable-conference-tickets-41014168482

- **Building Technologies Office's Better Buildings Residential Network Peer Exchange Call Series:** The Better Buildings Residential Network connects energy efficiency programs and partners to

share best practices and learn from one another to increase the number of homes that are energy efficient. One upcoming call is:

Kick the Cold: The Intersection of Healthy Homes and Energy Efficiency. February 22, 2018 1:00PM to 2:30PM EST. Register at https://energy.gov/eere/better-buildings-residential-network/events/kick-cold-intersection-healthy-homes-and-energy

Building America Program. *New Home IAQ Study.* Broadly, the study seeks to characterize IAQ and factors that impact IAQ in new homes built to current codes, including those with and without mechanical ventilation. Currently DOE is developing test plans.

- **Building America Solution Center.** (https://basc.pnnl.gov/). The BASC provides access to expert information on hundreds of high-performance construction topics. Updated guides for home construction have been recently added for:
  - how to install radon fans,
  - how to install a vertical radon ventilation pipe, the uses, selection process, and specifications of high-MERV **(**Minimum Efficiency Reporting Value) filters,
  - how to air seal an attached garage in new and existing buildings,
  - How to provide combustion air for fireplaces and how to test fireplaces for combustion safety, and
  - Basic steps for installing ceiling fans.

- **Building America Program. New Report**. *Review of Residential Comfort Control Products and Opportunities* 2017-12-15. Pacific Northwest National Lab. CE Metzger, S Goyal, MC Baechler. This paper has a section focused on comfort, health, and indoor air quality. This paper begins by discussing the interaction of each major component in advanced sensor and control applications related to HVAC equipment. The paper also looks at the applications of these components to commissioning, maintenance and operations of the HVAC equipment in residential buildings. A summary of state-of-the-art product features is also provided. These products are categorized through their primary application type (commissioning/maintenance or operation) and the features are categorized by component type (sensors, data storage, human-in-the-loop, communication, and controls). A common theme that emerges from this study is the importance of the ability for various product categories to be connected to each other. https://www.osti.gov/scitech/biblio/1417446-review-residential-comfort-control-products-opportunities

- **Building America Program. Recorded Webinar.** *Effect of Occupant Behavior and Air Conditioner Controls on Humidity in Typical and Low-Load Homes.* https://www.energy.gov/eere/buildings/building-america-meetings

- **Zero Energy Ready Homes Program.** The *Race to Zero Student Design Competition* has 84 teams registered which will be down-selected to 40 finalists who will compete at the National Renewable Energy Laboratory in April. All of these teams will be required to include comprehensive IAQ in their design solutions. https://energy.gov/eere/buildings/us-department-energy-race-zero-student-design-competition

- **Building Technolgies Office.** ASHRAE released the new *Advanced Energy Design Guide for K12 School Buildings: Achieving Zero Energy*. This resource was funded by DOE and has a section

(albeit short) on IAQ as it connects to other important attributes for school design. Further, it frequently calls out the importance of designing with IAQ in mind throughout, and offers comprehensive guidance on related design elements, such as CO2 sensors and filters. There's also an extensive additional resources section on IAQ. More info about the guide can be found here: https://energy.gov/eere/buildings/articles/unlocking-innovative-design-better-schools.

- **Lawrence Berkeley National Laboratory Healthy Efficient Homes Research & Standards.** POC Iain Walker (iswalker@lbl.gov) and Brett Singer (bcsinger@lbl.gov). This project is advancing innovative technologies, industry guidance and codes and standards to ensure good indoor air quality in homes. The program is core-funded by DOE and an Interagency Agreement with EPA's Indoor Environments Division. The Department of Housing and Urban Development's Office of Healthy Homes supported the program for two IAA cycles, through 2017. And research efforts are coordinated with several California Energy Commission projects and also work being conducted with other partners and collaborators. You can see more about this effort at this web page: https://energy.gov/eere/buildings/downloads/healthy-efficient-homes-research-standards. Five areas of particular focus are: Developing an IAQ scoring tool; Developing smart ventilation algorithms and tools; Overseeing the Building America new home IAQ study conducted by competitively selected teams; Conducting research to identify efficient solutions to inadequate kitchen exhaust ventilation; and improving building codes and standards. Recent work includes:

  - New Home IAQ Study:
    Currently developing field test protocols for the Building America New Homes IAQ Study, based on a Berkeley Lab study of new homes conducted for the California Energy Commission. The field data collection for that study will be completed in March 2018. Two conference papers report on partial data and interim findings:

    Ventilation and Occupants' Activities Impact on Indoor Air Quality in New California Homes. IAQA Conference 2018. Conference Paper: Kim, Y-S, Singer, BC, Walker, IS, and Chan, WR.

    Assessing Occupant and Outdoor Air Impacts on Indoor Air Quality in New California Homes. Proc. AIVC Conference 2017. Conference Paper: Walker, I.S., Kim, Yang-Seon, Singer B.C., and Chan W.R.

  - Smart Ventilation
    Created an international definition of **Smart Ventilation** in collaboration with the Air Infiltration and Ventilation Center. Developed new control algorithms for occupancy-based ventilation that account for non-occupant emissions. Working with Aereco on demand – controlled ventilation systems with modulating fans and air inlets as part of the SVACH study for the California Energy Commission.

    Journal article –"*Performance-based approaches to residential smart ventilation*" by Gaelle Guyot, Max Sherman, and Iain Walker. In REHVA Journal – June 2017 - for the Federation of European HVAC Associations. This article gives an overview of the performance-based approaches used in 5 standards and regulations. Each country uses different IAQ indicators. The common thread in all of these methods is the use at a minimum, of the exposure to a pollutant generated indoors (very often the CO2), sometimes combined with the condensation risk. A minimum airflow rate for unoccupied periods is also often required.

http://www.rehva.eu/fileadmin/REHVA_Journal/REHVA_Journal_2017/RJ3/p.9/09-11_RJ1703_WEB.pdf. Funding by DOE, CEC, and Aereco SA.

Related to the smart ventilation work is a study that LBNL did about consumer grade IAQ monitors for residential particles. That study is being presented later in this meeting.

- Kitchen Exhaust Ventilation -

  Evaluating the Performance of Island Kitchen Range Hoods. 2017. Proc. AIVC Conference 2017. Conference Papers: Walker, I.S., Rojas, G., Clark, J. and Sherman, M.H.

  Comparing Extracting and Recirculating Residential Kitchen Range Hoods for use in High Energy Efficient Housing. Proc. AIVC Conference 2017. Rojas, G., Walker, I.S. and Singer, B.C. 2017.

  Development of a Standard Capture Efficiency Test Method for Residential Kitchen Ventilation. Science and Technology for the Built Environment. Vol. 24, No. 2. Journal Article: Kim, Y-S., Walker, I.S. and Delp, W.W. https://doi.org/10.1080/23744731.2017.1416171. This article provides the background technical information for the new ASTM test method for range hoods.

- IAQ Score – Developed an initial version of the IAQ score to run on a web-browser.

- Industry Standard Technical Support – Collaborated with ASHRAE 62.2 (the standard for Ventilation and Acceptable Indoor Air Quality in residential buildings) committee and RESNET MultiFamily building working groups to develop new language for MF ventilation requirements and field diagnostics. Led development of ASHRAE 62.2 revisions to simplify the compliance path.

  Continued development of RESNET Standard 380 (Standard for Testing Airtightness of Building Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems) that includes measurement protocols for ventilation systems.

  Uncertainty in Air Tightness Measurements. AIVC Conference 2017. Conference Paper: Walker, I.S. 2017. This paper summarizes the field study data and analysis used to create the uncertainty estimates and corrections for RESNET 380 envelope leakage measurements.

NIST Update for CIAQ – February 14, 2018

NIST, National Institute of Standards and Technology

- NIST Net-zero House: The NIST Net Zero Energy Research Test Facility (NZERTF) is a two-story, four-bedroom house incorporating energy-efficient construction, space conditioning systems and appliances, as well as solar water heating and solar photovoltaics to meet the house's energy needs. For more information on the house in general, view the following video: http://www.youtube.com/watch?v=xSzu83fyQaQ. All publications can be found at the NIST NZERTF web page http://www.nist.gov/el/nzertf/. Testing is on-going of the thermal comfort provided using a small duct, high velocity distribution system as compared to a conventional air-to-air heat pump. Preliminary findings on this work has been submitted to the Indoor Air 2018 conference in Philadelphia, July 22-27, 2018. The work was done in collaboration with Dr. Hyojin Kim at The Catholic University of America. A tracer gas system has been installed in the home in order to obtain continuous air change rate measurements. Contact: Lisa Ng, 301-975-4853, lisa.ng@nist.gov.

- Improving the Reliability of Product Emissions Testing: EPA has issued a rule limiting formaldehyde emissions from wood products. To support improved labeling of low-emitting products, NIST is developing a formaldehyde reference standard with known contaminant emissions profiles to ensure more accurate determination of product emission rates. Formaldehyde reference materials were sent to four laboratories for an inter-comparison study**.** Small-scale chamber experiments following ASTM D6007 (Standard Test Method for Determining Formaldehyde Concentrations in Air from Wood Products Using a Small-Scale Chamber) were used to test the performance of the formaldehyde reference standard. Results will be presented at the Indoor Air 2018 conference. A larger reference standard is currently being designed for testing using ASTM E1333 (Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber). Contact: Dustin Poppendieck, 301-975-8423, dustin.poppendieck@nist.gov.

- Real-time outdoor air infiltration rates. NIST has entered into a Cooperative Research and Development Agreement (CRADA) with the National Center for Healthy Housing, and Beetle Management, Inc. entitled "Determination of real-time infiltration rates in homes using low-cost sensors". The objective of this collaboration is to investigate the use of air pressure sensors to estimate real-time infiltration rates in a home, in part to control mechanical ventilation systems. The development of such a method is intended to overcome the challenges and limitations that exist with tracer gas methods for determining infiltration rates. NIST is conducting a series of tracer gas tests at the Indoor Air Quality Test House and the NZERTF on the NIST campus. The Collaborators and NIST are conducting this testing over a set of indoor conditions that may affect infiltration rates, such as switching fans on and off, and opening doors and/or windows. Using the data and a detailed multizone airflow model of the home, the Collaborators and NIST will develop a simplified model of the house that can be used to estimate real-time air infiltration rates, which will hopefully be generalizable for use in other houses. Contact Lisa Ng, 301-975-4853, lisa.ng@nist.gov.

- **ASHRAE Standard 62.2**
  The committee responsible for Standard 62.2 on residential ventilation and IAQ met in January in Chicago to continue working on proposed changes that may be included in the 2019 version of the standard. Topics being addressed include filtration credit for reducing ventilation rates, changes to multifamily housing requirements, kitchen hood capture efficiency, ventilation requirements for use of unvented combustion heaters, and ventilation distribution credit. Contact: Steven Emmerich, 301 975-6459, steven.emmerich@nist.gov.

- **ASHRAE Position Documents**
  The IAQ Position Document Committee will meet in January in Chicago as they continue to work on updating that document. A focus of the document is discussion of factors that inhibit that provision of better IAQ. The new version of the Position Document is expected to be published in 2018. Contact: Andrew Persily, 301 975-6418, andyp@nist.gov.

  ASHRAE has initiated a revision of its Position Document on Environmental Tobacco Smoke, which is expected to be approved and published in 2018. Contact: Andrew Persily, 301-975-6418, andyp@nist.gov.

  ASHRAE has also initiated a new Position Document on Resilience, which held its first meeting last December. A final version will hopefully be completed and approved during 2018. Contact: Andrew Persily, 301-975-6418, andyp@nist.gov.

- **ASHRAE Standard 189.1**
  The 2017 version of ASHRAE/ICC/IESUSGBC SSPC 189.1, Standard for High-Performance Green Buildings Except Low-Rise Residential Buildings, was approved for publication late last year and includes 75 individual revisions to the 2014 version. The standard will constitute the technical content of the 2018 International Green Construction Code, which will be available in the U.S. and Canada in the spring. Standard 189.1-2017 itself will only be available outside of these two countries per an agreement between AIA, ASHRAE, ICC, IES and USGBC. In the area of indoor environmental quality, revisions that have been incorporated into the 2017 standard include a restriction on the indoor use of unvented combustion devices, a requirement for occupant surveys to assess satisfaction with indoor environmental quality, and improvements to lighting quality through daylighting and glare control.

  The committee holds monthly web meetings, which are open to all interested parties. More information on the 189.1 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. Contact: Andrew Persily, 301-975-6418, andyp@nist.gov.

- **ASHRAE *Green Guide***
  The *Green Guide*, 5th Edition was published in January. It is available from the ASHRAE bookstore as a hardcopy and in PDF form. NIST took the lead on revising the IAQ Chapter. Contact Lisa Ng, 301-975-4853, lisa.ng@nist.gov.

- **ASTM: D22.05 Subcommittee on Indoor Air**
  On April 12th, 2018, there will be a day long workshop on Sampling and Analytic Advances in Formaldehyde and Other Carbonyl Compounds Determination in Air at the semi-annual ASTM meeting in San Diego. This workshop will feature 13 international speakers. Dustin Poppendieck will present information relating to the NIST formaldehyde reference material. Contact: Dustin Poppendieck, 301-975-8423, dustin.popendieck@nist.gov.

  Standard D6245 Using Indoor Carbon Dioxide Concentrations to Evaluate Indoor Air Quality and Ventilation. Based on a newly developed method for estimating the rate at which building occupants emit carbon dioxide, a revision was approved at the subcommittee level. A main committee ballot was recently released, which was scheduled to close February 9th. Contact: Andrew Persily, 301-975-6418, andyp@nist.gov.

CPSC, Consumer Product Safety Commission

(POC, Joanna Matheson, 301.987.2564, jmatheson@cpsc.gov)

- Nano material studies: Interagency activities with NIOSH continue including evaluation of nanomaterials in and released from laser printers and additives for wood and wood coatings. Similarly interagency activities with the EPA continue on evaluating nanomaterial release from engineered nanomaterial (ENM) surface coatings applied to outdoor surfaces for protecting and preserving those surfaces. Aging effects are being analyzed. Interagency work at NIST continues on quantifying nanomaterial release from various matrices in the indoor environment (e.g., document protocols to characterize nanoparticles released from surface coatings associated with products such as flooring finishes and interior paints), distinguishing engineered nanoparticles from those produced incidentally, expanding indoor air models (e.g., CONTAM) to predict airborne exposures to nanoparticles in occupied buildings associated with release from consumer products as well as the development of a bioassay validation program. TERA is completing the literature review on carbon nanotubes, nano silver and titanium dioxide as an update to the Versar 2011 review, with a goal to determine whether the literature is sufficiently robust to determine a NOAEL/LOAEL/ADI. The University of Cincinnati is preparing a commercialization report on nanomaterials and is assembling a database of physical-chemical characteristics and toxicology data (if available) on known nanomaterials. CPSC is cosponsoring with the National Nanotechnology Coordination Office (NNCO) to hold a second "Quantifying Exposure to Engineered Nanomaterials (QEEN) from Manufactured Products" conference in 2018. (POC Treye Thomas, 301.987.2560, tthomas@cpsc.gov; Joanna Matheson, 301.987.2564, jmatheson@cpsc.gov).

- Portable generator safety: Last Nov, the U.S. CPSC voted to approve a notice of proposed rulemaking (NPR) to reduce the risk of carbon monoxide (CO) poisoning deaths and injuries associated with portable generators. The proposed rule limits portable generators' CO emission rates. The proposed rule's CO emission rates, which are technically achievable using existing and proven emission control technologies that are already in the marketplace, are expected to lower the CO emission rate from that of current generators by nominally 90%. The Federal Register notice with information about the proposed rule is available here: https://www.federalregister.gov/documents/2016/11/21/2016-26962/safety-standard-for-portable-generators. The comment period closed April 24, 2017. The comments can be viewed by going to www.regulations.gov , and typing CPSC-2006-0057 on the search line.

  In parallel with staff preparing the proposed rule for the Commission, staff has been participating in development of voluntary standards to address the hazard without rulemaking. As has been reported in previous CIAQ meetings, staff has participated in a task group formed by Underwriters Laboratories to develop a proposal for a test method to be used for measuring portable generator CO emission rates. UL opened the proposal for balloting by the standards technical panel to receive ANSI recognition. The proposal received 59% votes in favor, which did not meet the 66.7% needed for ANSI recognition. In a separate effort, staff are also participating in a steering committee of the Portable Generator Manufacturers Association (PGMA), which is currently developing revisions to PGMA's G300 standard, *Safety and Performance of Portable Generators*, to address the CO hazard by means of a CO detection and shutdown system. (POC Janet Buyer, 301.987.2293, jbuyer@cpsc.gov).

- Spray Polyurethane Foam (SPF) activities: Under the ASTM Air Quality/Indoor Air (D22.05) subcommittee, CPSC has been involved in providing technical support for the development of voluntary standards to test for chemical emissions from SPF insulation. ASTM Work items WK40293, WK51588 and WK52052 focus on measuring or modeling emissions from SPF products using micro-scale environmental test chambers, a large-scale spray booth, or computer models.

  An interagency agreement (IAG) was signed with NIST to conduct chamber testing of SPF samples. The IAG has helped to develop methods that will characterize and quantify releases of amines and other compounds to aid in ASTM standard development. CPSC has also initiated a state only-CPSC working group on SPF. A federal partners working group is meeting mid-March to provide updates on activities on SPF insulation and its emissions into home indoor air. State agencies please contact the new POC Adrienne Layton if interested in participating. (POC: Adrienne Layton, 301.987.2590, alayton@cpsc.gov; Treye Thomas, 301.987.2560, tthomas@cpsc.gov;).

- Mold Projects: CPSC contracted with TERA to perform a review on the health risks of common mold species likely to be found in and around the home. Two reports, "Review of the Health Risks of Mold, Basic Mold Characteristics" and "Review of the Health Risk of Mold, Health Effects of Molds and Mycotoxins" can be found online at: https://www.cpsc.gov/Research--Statistics/Chemicals/. Those reports were used by TERA to develop a tool, a dashboard to perform a preliminary hazard assessment on mold. Staff is currently assessing the draft tool. (The new POC for mold work is Eric Hooker, 301-987-2516, ehooker@cpsc.gov).

- 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. NSF has recently formed a smaller subgroup in order to make progress on the draft standard and will update the entire 440 group on their progress in the near future.

- ANSI/Composite Panel Association – Particleboard and MDF formaldehyde standards - CPSC staff submitted comments in late 2015 regarding proposed revisions to the ANSI A208.1 (medium density fiberboard) and ANSI A208.2 (particleboard) standards. There has been no further activity with this group (POC Kent Carlson, 301.987.2578, kcarlson@cpsc.gov).

- Formaldehyde (FA) Activities: CPSC staff participated in a UL-sponsored roundtable discussion of FA toxicology, airborne FA in residential settings, and resultant consumer uncertainty and concern. Following the discussion, UL identified next steps including the summarization of all available standards for FA and identification of standards gaps, evaluating and conducting research to further define the link from product emissions to air concentration, identification an review of acute/chronic exposure guidelines based on FA irritancy, summarizing current literature on FA in homes, identifying primary sources and modifiers of FA in the home,

evaluating different consumer FA measurement devices, and evaluating different methods to relay FA-related information to consumers. There has been no further activity with this group (POC Kent Carlson, 301.987.2578, kcarlson@cpsc.gov).

- Emerging Technologies/3D Printers: CPSC Staff is interested in consumer 3D printing and potential air contaminant (VOC and particle) release. Staff has reviewed publications with 3D printer emission data and estimated preliminary risk from exposure to emitted VOCs in order to determine potential health and safety issues to consumers (SOT poster). CPSC student interns have investigated potential risks associated with 3D printing in primary schools. A poster highlighting health and safety issues is in preparation. Staff has also recently participated in an ANSI/America Makes conference to identify current voluntary or other standards and standard gaps for additive manufacturing (3D printing). Staff has also joined the ASTM F42/ISO TC261 Additive manufacturing group, which's scope is "The promotion of knowledge, stimulation of research and implementation of technology through the development of standards for additive manufacturing technologies." Federal agencies interested in sharing information should contact CPSC (POC Treye Thomas 301.987.2560, tthomas@cpsc.gov, Kent Carlson , 301.987.2578, kcarlson@cpsc.gov)

EPA, Environmental Protection Agency – Indoor Environments Division

Schools

- **Indoor Air Quality and Energy Efficiency Guidance for Schools.** IED's Schools Team continues our work making the connection between IAQ, energy efficiency, occupant health and safety protections through assisting school districts carrying out renovations and retrofit projects. EPA's *Energy Savings Plus Health: Indoor Air Quality Guidelines for School Building Upgrades* guidance was released a few years ago to assist school districts are protecting IAQ during these renovation projects. The Team is preparing for a webinar – **Making the Connection: Linking IAQ, Energy Efficiency and Preventive Maintenance Together for Healthy Schools** taking place on Thursday, February 22nd. The webinar will explore the critical connection between IAQ, energy efficiency and preventive maintenance, and the importance of properly integrating them for optimal occupant health and building performance during a renovation project. The webinar will feature Ellen Tohn, Tohn Environmental Strategies and Schools of Guntersville, AL. Please share this guidance, the Interactive Air Quality Planner, and other resources linking the benefits of integrating IAQ management with renovation projects with your stakeholders. and remember, linking the benefits of integrating IAQ management with energy efficiency upgrades is a win-win for all. It is available on EPA's website at http://www2.epa.gov/iaq-schools/iaq-guidelines-school-building-upgrades-energy-savings-plus-health . Register for the webinar at https://register.gotowebinar.com/register/5573318176764256770.
  POC: Michele Curreri at curreri.michele@epa.gov

- **Schools Team Continues the IAQ Knowledge to Action Webinar Series.** IED's Schools Team popular *IAQ Knowledge to Action Professional Training Webinar Series* continues, building upon the success of the previous webinars, this new series explores IAQ and the benefits of preventive maintenance to promote a proactive approach to addressing IAQ issues in schools. The next webinar in this series - **From Roof to Curb: Taking a Comprehensive Approach to IAQ Management Through Preventive Maintenance** is taking place on Thursday, March 8th. During this webinar we will further explore the components of a model IAQ preventive maintenance plan and assessment checklist and will feature Des Moines Public Schools, Iowa and their Preventive Maintenance Program. Registration is open and can be found at https://register.gotowebinar.com/register/8491061397068364545. **Register Today**.
  POC: Tracy Enger at enger.tracy@epa.gov

- **Expanding the Reach for School IAQ Training.** IED's School Team has enjoyed tremendous success with the two professional training webinar series, the 10-part *IAQ Master Class Professional Training Webinar Series,* and the subsequent series, *IAQ Knowledge to Action Professional Training Webinar Series.* Since the launch in 2015, more than 3,000 participants have generated nearly 6,000 views of the trainings. All webinars are available "on demand". Register to view the webinars at https://www.epa.gov/iaq-schools/indoor-air-quality-schools-master-class-webinar-series. We are eager to drive even more action in school districts through spreading the IAQ Master Class Professional Training Webinar Series across more networks and platforms. Please contact IED's Schools Team if your

organization would like to use your existing training platforms and vehicles to host or link to EPA's IAQ Master Class Professional Training Webinar Series.
POC: Tracy Enger at enger.tracy@epa.gov

- **IAQ Tools for Schools Mobile App**. IED's Schools Team continues to promote the use of the IAQ TfS Mobile App as a great free resource for schools and districts to manage, monitor and maintain IAQ programs that promote healthy, productive indoor environments. Download the Mobile App today at https://www.epa.gov/iaq-schools/school-iaq-assessment-mobile-app.
POC: Sheila Brown at brown.sheila.@epa.gov

Indoor airPLUS Label (IAP) and Healthy Home Performance (HHP)

- **Indoor airPLUS Results** - IED's Indoor airPLUS Program has experienced continued growth through 2017 exceeding last year's grand total of labeled homes by over 1,000. Builders and Home Energy Raters continue to partner with EPA and label Indoor airPLUS homes all across the country, highlighting the importance that industry places on the health and safety tenets that come with the Indoor airPLUS label. The first quarter of 2017 boasted the best quarter of the program's history, and the third quarter missed that mark by one labeled home. The growth of the program has resulted in the program exceeding 13,000 labeled homes and adding over 200 new partners by year's end.

- **Educating Partners and Industry** – Our Indoor airPLUS team continues to conduct training and outreach through webinars and conferences. In January, our staff presented in three sessions at the NAHB International Builders' Show in Orlando. The presentations were on the comparison between Indoor airPLUS and the National Green Building Standard, as well as radon resistant techniques. The radon topic continued later in the month with a webinar on radon-resistant new construction (RRNC) that addressed updates and exceptions in the Indoor airPLUS Construction Specifications regarding radon. The program will be releasing Revision 4 of the Indoor airPLUS Construction Specifications soon, and we're planning to host a webinar in the coming weeks to discuss those program updates.

- **Energy Saving Plus Health Guidance Updates –** The Indoor Environments Division (IED) developed the single-family (2011) and multi-family (2016) guidance documents to address indoor air quality (IAQ) concerns during energy upgrades, through voluntary guidance that gives best practices for improving IAQ in conjunction with energy upgrade work. As technology and research advances, there comes a need for an update to these guidance documents. IED will update both of these at the same time to make them more synergistic. These updates include references to building codes, industry standards and URLs; best practices and technical guidance; recent developments in pollutant control (e.g., particulate matter, radon, moisture); and general formatting for improved usability by industry stakeholders. The end result will be guidance that will not only help the user improve their IAQ but, we hope, provide an opportunity to sell improvements in existing homes.

- **Labeling existing homes with Indoor** airPLUS **-**The Indoor Environments Division will explore further transforming the practice of residential home renovations through the inclusion of

existing homes in the Indoor airPLUS label. A central focus of IAP V2 will be to assist the home performance industry (energy auditors, renovators, HVAC service providers, etc.) through providing a platform consisting of technical expertise, guidance, and tools intended to increase consumer activity/demand for renovations that maximize healthy home improvements. IED has been meeting with key stakeholders from the home performance industry including representatives from Building Performance Institute (BPI), Department of Energy Home Performance with Energy Star (HPwES), Housing and Urban Development (HUD), Efficiency First, Home Performance Coalition, and networking at regional and national conferences to discuss labeling existing homes and to assess the technical needs of industry and stakeholder buy-in and support.

Radon

- **National Radon Action Plan** - IED continues to support the growing national network of Federal Agencies, Private Sector, NGOs and States to prevent lung cancer deaths through the National Radon Action Plan (NRAP). Along with its founding members, the American Lung Association has brought in supporting organizations (those who have signed a declaration of support) and emerging potential partners (organizations identified to help drive progress) to increase the mitigation of existing homes and the construction of new homes with radon-reducing features. The NRAP expands the efforts under the Federal Radon Action Plan to focus on actions that go beyond federal governmental actions alone.

  The National Radon Action Plan presents a long-range strategy for eliminating avoidable radon-induced lung cancer in the United States. The Plan's near-term goals are to reduce radon risk in 5 million homes and to save 3,200 lives by 2020. While the 2020 goals offer bold and important milestones, they are not the endpoint. Our ultimate goal is to eliminate avoidable radon-induced lung cancer in the United States by incorporating radon testing, radon mitigation and radon-resistant construction into the systems that govern purchasing, financing, constructing and renovating homes and other buildings. Progress for NRAP strategies can be tracked at RadonLeaders.org/nationalradonactionplan. Some highlights include:

  - The National Tribal Air Association has signed on in support of the National Radon Action Plan and now has a Tribal representative as a member of the Leadership Team. The American Thoracic Society, the American Public Health Association, the Asthma and Allergy Network and Trust for America's Health have all signed on to the goals and strategies in the plan.
  - NRAP Team has identified addressing radon gas risk reduction via informing housing finance underwriters about radon in liability risk management. The concept is explored in the "Managing Radon's Radioactive Liability" presentation. The Team is beginning work on a series of webinars communicating risk management of radon to housing finance sector in 2018.
  - HUD has awarded Health Research, Inc. /New York State Dept. of Health $435,000 to investigate an effective sampling strategy for radon testing in multi-family housings. The

researchers will obtain and analyze over 7,000 results of completed radon measurements from 100% of ground-floor units in over 500 multifamily buildings.

- In collaboration with AARST, EPA submitted and successfully defended a proposal for International Green Construction Code (IGCC) to require RRNC and testing to below 2.7 pCi/L in commercial buildings. The IGCC is the first international building code to require radon to be addressed, and it will be published this year.

- **New Guide for Health Care Providers!** the Conference of Radiation Control Program Directors, Inc., has developed a new guide for health care providers titled Reducing the Risk from Radon: Information and Interventions. This guide was designed to furnish health care providers with the information they need to reduce their patients' exposures to radon. Radon is estimated to cause about 21,100 lung cancer deaths per year and is the leading environmental cause of cancer mortality in the United States. We're asking our stakeholders to post the widget on their websites to help promote the Guide. Please visit http://www.radonleaders.org/resources/reducingtheriskfromradon.

- **Radon Credentialing** - As part of our role to support state programs and make sure consumers receive the best possible radon services, we have issued a Federal Register (FR) Notice seeking public feedback on a proposed approach for developing voluntary criteria for organizations that credential radon service providers. These criteria will establish an ongoing and open evaluation process for organizations wanting to credential radon service providers. The FR Notice comment period closed on November 23rd and we are now analyzing more than 20 comments representing a range of stakeholder perspectives. Over the next year we will focus our efforts on formulating and initiating an approach forward. We will continue to engage stakeholders throughout the process. The total time it takes to complete this work will depend on the approach. At a minimum we anticipate this work will take another two years. During this time, states receiving State Indoor Radon Grant (SIRG) funding are required to list only radon service providers who are certified through a state licensing process or by NRPP or NRSB, the two credentialing bodies currently recognized by EPA. Please visit www.epa.gov/radon to learn more about EPA's proposal.

Asthma

- May is Asthma Awareness Month and its coming soon. This month provides a great opportunity for EPA to raise asthma awareness and educate stakeholders on the importance of comprehensive asthma management which includes medical treatment and reducing exposures to environmental triggers.

  During May, EPA will honor a health plan, healthcare provider, and a community-based asthma program with the National Environmental Leadership Award in Asthma Management. This award signifies that a program is outcome-driven, comprehensive, and grounded in best practices for asthma care. To date, there have been 41 winners. The most recent call for applications closed February 7th. Winners will be announced in May and featured on an Asthma Webinar to kick off Asthma Awareness Month. For more information

and to learn about these award-winning programs, visit http://www.asthmacommunitynetwork.org/awards

Use tools and resources on **AsthmaCommunityNetwork.org** to maximize your program's impact this May. Promote your Asthma Awareness Month events in the **Events Calendar**, and then connect with other programs by sharing your Asthma Awareness Month story in a **Network Blog.** If you are not already a member of the Network, we encourage you to join today and engage with over 1,100 asthma programs. www.asthmacommunitynetwork.org.

- For the past five years, and in service to the Coordinated Federal Action Plan to Reduce Asthma Disparities (or Asthma Disparities Action Plan), we have collaborated with the Departments of Housing and Urban Development (HUD) and Health and Human Services (HHS) to host regional summits aimed at helping states and communities find local solutions to secure sustainable financing for in-home environmental interventions. The summits present an opportunity to interact directly with state Medicaid, healthy homes and asthma control programs and support partnerships and solutions across health, housing and environmental sectors to secure reimbursement through Medicaid. In 2017, EPA, in partnership with HUD and CDC, convened past summit hosts and local leaders working to secure Medicaid reimbursement to identify lessons learned and challenges. This past October, the group agreed to formally convene as a community of practice. Moving forward the community of practice, supported by EPA facilitation, will meet regularly to share progress, tackle challenging issues and identify key learning that may benefit other communities. EPA will also develop tools to help translate and spread learning from the group to a broader audience. For more information on the sustainable financing summits: http://www.asthmacommunitynetwork.org/resources/conferences

- The Financing In-Home Asthma Care microsite within ACN.org provides states and communities with resources to help advance local solutions for sustainable financing of in-home environmental interventions. Developed in partnership with HUD and CDC, this microsite will serve as a platform to help spread learning that emerges from the community of practice. http://www.asthmacommunitynetwork.org/Financing

- The National Center for Healthy Housing in partnership with EPA, launched an eLearning and technical assistance platform which equips participants with information about how to build the systems, infrastructure and financing to put home-based asthma services in place in their own states, communities or regions. To access the eLearning modules, click on http://nchh.org/Program/EquippingStatesforReimbursement.aspx

IED Tribal Program

- Mr William "Bill" Thompson of the Penobscot Tribe in Maine has been working with us for close to a year now. He'll soon begin his second year under the terms of an Interagency Personnel Agreement (IPA) EPA has with the Tribe. As you know, IED has an initiative known as the Federal Tribal Collaboration (FTC). Bill is working with us to leverage other Federal agency resources to benefit IAQ in the Tribal community. The FTC is a two-fold approach to: (1) have IAQ projects be eligible in Federal Tribal grant and loan programs; and (2) build Tribal capacity to successfully apply for and receive funding, and implement effective IAQ

interventions. We are currently working with three Federal Agencies, HUD, USDA, HHS, and we have opened a dialogue with DOE. We are also collaborating with the Native American Indian Housing Council, which provides technical assistance to Tribes.

IED Cooperative Agreements

- In 2017, IED conducted a national grants competition and a competitive evaluation process, resulting in six organizations being selected and receiving cooperative agreements. The cooperative agreements began this federal fiscal year 2018 in October 2017 and contingent upon Agency and program funding levels will end in September 2020. These projects are dedicated to improving indoor air quality and educating Americans on how to reduce the environmental risks of indoor contaminants. The following organizations who received awards are:
    - **Radon:**
        - Kansas State University
        - Conference of Radiation Control Program Directors
        - American Lung Association of Washington DC
    - **Asthma:**
        - Green and Healthy Homes Initiative
        - Public Health Institute-Regional Asthma Management and Prevention Program
    - **Comprehensive Indoor Air Quality:**
        - Environmental Law Institute

  For more details about the projects and activities of each agreement, please see

  https://www.epa.gov/indoor-air-quality-iaq/cooperative-agreement-funding-indoor-air-quality

CIAQ Mold Work Group Update

- **CIAQ Mold Work Group** is scheduled to meet in March. The group will plan to report out at the CIAQ me