

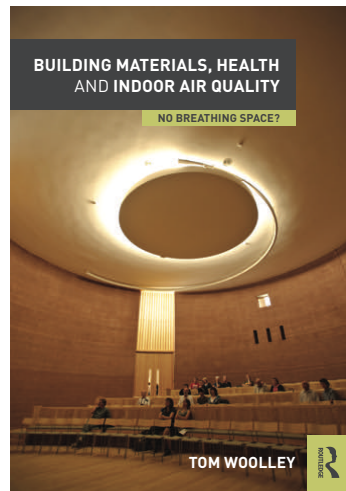
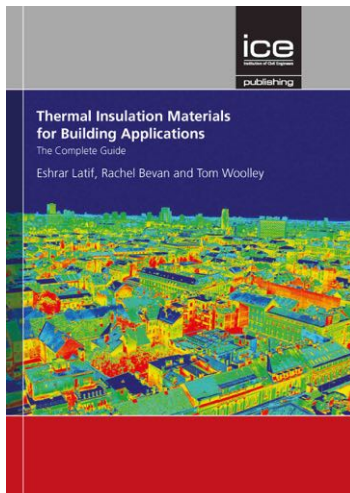
Retrofit and Health

“Installing Insulation improves health”

Busting the Myths

Tom Woolley – Architect and Author

- Almost no objective research to substantiate the contention that insulation improves health!
- Good research and plenty of anecdotal material confirms the opposite
- Why?: Most retrofit schemes are badly done, use the wrong insulation materials and ignore the issue of ventilation.
- This has led to damp and mould, worsening respiratory and asthmatic conditions and even unlivable houses in hundreds of thousands of cases. Most insulation contains hazardous chemicals that can aggravate respiratory and asthmatic conditions.
- Literature on fuel poverty refers to insulation in general terms without any detail or understanding of how buildings work.



Exeter research confirms no improvement in health after retrofit. Sealing up houses often leads to poorer indoor air quality. Global studies on VOC emissions confirm massive health problems from materials currently in use



Higher energy efficient homes are associated with increased risk of doctor diagnosed asthma in a UK subpopulation

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Sharpe, R.A, Machray, K.E., Fleming, L.E., Taylor, T. 1, Henley, W., Chenore, T., Hutchcroft, I., Lemon, S., Merrifield, R. & Wheeler, B.W.

Modelling the impact of fuel poverty and energy efficiency on health

Final report to EAGA charitable trust May 2018)

“in both the national and local analyses where there was a suggestion of a positive association, i.e. higher admission rates in areas where average home energy efficiency was greater. There were a smaller number of instances where an inverse association was observed. “

RESEARCH

RESEARCH ARTICLE

ATMOSPHERIC CHEMISTRY

Volatile chemical products emerging as largest petrochemical source of urban organic emissions

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A gap in emission inventories of urban volatile organic compound (VOC) sources, which contribute to regional ozone and aerosol burdens, has increased as transportation emissions in the United States and Europe have declined rapidly. A detailed mass balance demonstrates that the use of volatile chemical products (VCPs)—including pesticides, coatings, printing inks, adhesives, cleaning agents, and personal care products—now constitutes half of fossil fuel VOC emissions in industrialized cities. The high fraction of VCP emissions is consistent with observed urban outdoor and indoor air measurements. We show that human exposure to carbonaceous aerosols of fossil origin is transitioning away from transportation-related sources and toward VCPs. Existing U.S. regulations on VCPs emphasize mitigating ozone and toxics, but they currently exempt many chemicals that lead to secondary organic aerosols.

Exposure to air pollution is the fifth ranking human health risk factor globally, following malnutrition, dietary risks, high blood pressure, and tobacco (1). Secondary organic aerosols (SOA), a major component of fine particulate matter (PM_{2.5}) in cities around the world (2), form through oxidation of volatile organic compound (VOC) precursors. Oxidation of VOCs in the presence of nitrogen oxides (NO_x = NO + NO₂) also contributes to tropospheric ozone (O₃), which increases risks of mortality from respiratory diseases (3). A recent epidemi-

ological study suggests that adverse human health effects occur below current U.S. standards for PM_{2.5} and O₃ (4). It is thus critical to identify and quantify the most important human-produced sources of VOC emissions to effectively mitigate air pollution and improve human health.

Automotive emissions of VOCs have decreased steadily from efforts to control tailpipe emissions in the United States (5) and Europe (6). As a result, other sources of VOC emissions are likely growing in relative importance (7). Transportation emissions of NO_x and VOCs have long been considered major contributors to formation of O₃ (8) and SOA (9–11) in urban areas, although recent studies have suggested the importance of nonvehicular sources as major contributors (12–14). Emissions from the use of chemical products have been difficult to constrain in models (15) or from ambient measurements (16). One challenge has been the lack of available atmospheric measurements of oxygenated volatile organic compounds (OVOCs) common in everyday household products (16). Here, we focus on volatile chemical products (VCPs), including pesticides, coatings, printing inks, adhesives, cleaning agents, and personal care products. These

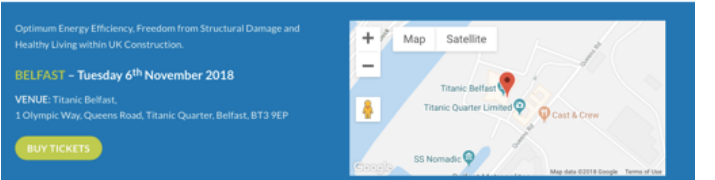
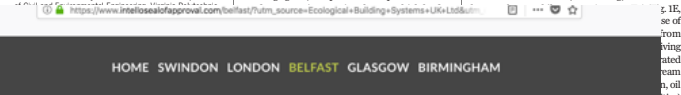
to support this finding: (i) energy and chemical production statistics; (ii) near-roadway measurements of transportation emissions, together with laboratory testing of chemical products; (iii) ambient air measurements away from roads; and (iv) indoor air measurements.

Mass balance of hydrocarbons in the petrochemical industry

We used energy and chemical production statistics, together with near-roadway and laboratory measurements, to construct the mass balance shown in Fig. 1 (7). In 2012, the amount of oil and natural gas used as fuel in the United States was ~15 times the amount used as chemical feedstocks (Fig. 1A). Chemical feedstocks are almost entirely derived from fossil hydrocarbons (18) and are transformed to chemicals found in everyday household products (tables S1 to S3). We focus on emissions from organic solvents, which consist mostly of intermediate-volatility organic compounds (IVOCs) and higher-volatility VOCs (fig. S1). The evaporation time scales of higher-volatility VOCs range from milliseconds to hours, and for IVOCs from hours to months (19). The fraction that can be emitted to the atmosphere depends strongly on product type and use (table S4). For example, a high fraction of organic compounds evaporate from architectural coatings. Most organic compounds in soaps and detergents dissolve in water and end up in sewer systems (20), with negligible amounts emitted from wastewater treatment plants (21).

Total gas-phase VOC emission factors of mobile source fuels and VCPs are based on field (e.g., near-roadway) and laboratory experiments reported in the literature (Fig. 2). A key finding is that VOC emission factors (emission amount per unit product use) resulting from the use of many chemical products are one to two orders of magnitude higher than from automobile exhaust. The relatively low VOC emission factor for on-road gasoline engines today (Fig. 2) results from (i) combustion oxidizing most hydrocarbons in fuel to carbon dioxide, and (ii) the increasing effectiveness of modern three-way catalytic converters in reducing tailpipe VOC emissions over multiple decades (5–7). Consequently, the relative importance of VCP emissions has grown. For example, mixing ratios of acetone, a marker of coating-related VCPs in this study and in the past (16), increased in ambient air in Los Angeles from 1990 to 2010 (22). This is in sharp contrast to VOCs present in gasoline exhaust, which decreased markedly during the same period (22), except for ethanol (23).

Although U.S. sales of VCPs are substantially smaller than for gasoline and diesel fuel, VOC emissions from VCPs (7.6 ± 1.5 Tg) are twice as



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Claims in the literature that retrofit insulation leads to improved health are almost entirely based on a very limited study by Howden Chapman in New Zealand

- *The NI Warm Homes scheme (NIWH) retrofits houses and directly improves SAP ratings (i.e. energy ratings of dwellings). Although improvements in the health of inhabitants is also central. (citing the Howden Chapman study) Liddell 2013*
- *Significant improvements in health-related quality of life were found in a randomised controlled trial of home insulation, which concluded that targeting home improvements at low-income households significantly improved social functioning and both physical and emotional well-being (including respiratory symptoms) The Health Impacts of Cold Homes and Fuel Poverty by the Marmot Review Team for Friends of the Earth May 2011) .(cites Howden Chapman)*
- **I looked into the Howden Chapman study**
- **(Effect of insulating existing houses on health inequality: cluster randomised study in the community. Howden-Chapman P. et al . BMJ. 2007 Mar 03; 334(7591):460)**
- ***Households randomly allocated to the intervention group had their houses insulated (June to August 2001). The intervention consisted of installing ceiling insulation, draught stopping around windows and doors, and fitting sisalated paper beneath floor joists and a polythene moisture barrier on the ground beneath the house***
- ***Mean bedroom temperature increased in the insulated houses from 13.6°C to 14.2°C and in the uninsulated ones from 13.2°C to 13.4°C. (0.6 of a degree!!!)***
- **Based on self reporting by a very small group**

Cavity wall insulation 'a scandal', Arfon MP claims

By Sian Elin Dafydd
BBC News
18 April 2017



Residents' fight against cavity wall insulation issues

29 November 2017



Damp wall inside Kenneth Bowen's house in Hawthorn, Pontypridd



Success of Kirklees exaggerated

The Kirklees Project has earned its status as a best practice model of home insulation projects. Of a Kirklees council capital investment of £13.3M, **benefits to mental well-being and physical health are estimated to recoup 36p in the £ over a lifespan of likely impacts**. Of the Kirklees Warm Zone Health and well-being impacts from insulation and heating are more evidence-based than are estimates of impacts from smoke alarms, CO monitors, and fire safety checks. (Liddell et al 2011)

BUT THERE IS NO EVIDENCE

The results demonstrate that impacts in lower income areas have reduced energy use and carbon emissions whilst also improving comfort levels and reducing fuel poverty.....The indirect benefits of this, **particularly on public health**, can be expected to be significant. The impacts of household retrofit and domestic energy efficiency schemes: A large scale, ex post evaluation **Phil Webber , Andy Gouldson, Niall Kerr E. Energy Policy 84(2015)35–43)**

The lead author of this study, Phil Webber, was one of the local authority officials, as Head of the Environment unit at Kirklees from 1990 to 2011, in charge of the programme. Webber is also a director of YES energy solutions, a not for profit installation community interest company that carried out many of the retrofit installations

Health benefit claims of BRE study exaggerated

*Research (what research????!) has suggested that if all of the English housing stock with a SAP below the historic average of 41 was to be brought up to at least the current average of 51 through heating and insulation improvements, the **health cost-benefit to the NHS would be some £750 million per annum**. Research by the BRE in 2010 suggested that if all of the English housing stock with a SAP below the historic average of 41 was to be brought up to at least the current average of 51 through heating and insulation improvements, the health cost-benefit to the NHS would be some £750 million per annum. Other BRE estimates put the costs to the NHS of energy inefficient housing at £192 million (£35 million of which was in the private rented sector). Use of the initial version of the BRE category 1 health cost calculator put the estimated private rented sector costs to the NHS at between £37 and £674 million depending on SAP rating and occupancy level.26. (Sheldrick, B., Hepburn, D., 2004. Assessing the impact of the central heating programme on tackling fuel poverty: Report of the first year 2001–2002. Scottish Executive, Edinburgh)*

Many other studies have relied on Howden Chapman as the only evidence of health benefits

- NEA and The Children's Society (for National Grid Affordable Warmth Solutions), 2015, Making a House a Home: Providing affordable warmth solutions for children and families living in fuel poverty. Available at: <http://www.nea.org.uk/wp-content/uploads/2016/01/Making-a-House-a-Home.pdf> [Accessed 06/03/2017] A cluster randomised trial in which 1350 houses were retrofitted with insulation in **New Zealand** found that the intervention resulted in \$3,374 of benefits, compared with \$1,800 of costs. Of these benefits, 61% had accrued in the health sector.
- Evaluation of the Warm At Home Programme by Sheffield Hallam estimated that the programme had led to 121.8 QALYs. This was the equivalent of around £2,436,000 in additional benefits. For every £1 of funding received, the programme produced £4 in health-related benefits. The evaluation found that although cost effectiveness reduced as the cost of the intervention increased, the health and wellbeing benefits that accrued from higher cost-interventions were still greater. The evaluation did not account for the longer term health benefits that would accrue over time following higher cost interventions, nor did it account for the wider social benefits.⁷² Preval, N., Keall, M., Telfar-Barnard, L., Grimes, A., **Howden-Chapman, P.**, 2017, Impact of improved insulation and heating on mortality risk of older cohort members with prior cardiovascular or respiratory hospitalisations, British Medical Journal Open 7:e018079

The Victims of bodged retrofit schemes

Linda Griffiths and Linda O'Connell – EWI Failure- Our story 2013-2018 – still unresolved - **One of thousands**



experienced before.



Saturated boards rendered & meshed whilst still wet, & missing fixing at bottom corner. Also surface of board was shaved removing the protective fibreglass layer.



Deterioration Since October 2015



“3 million homes in England,” estimated to have been damaged by defective retrofit schemes, many in Wales and NI, fewer in Scotland due to better controls and awareness



Northern Ireland Housing Executive tasks BBA CIT with delivering groundbreaking cavity wall insulation study



White van “man” now makes more money from extracting insulation than installing



CIVALLI
Regain control of your home

Supporting Victims of Failed Cavity Wall Insulation



Neath failed EWI

Parextherm Mineral Render System

PAREX THERM MINERAL render systems offer a specially formulated mineral based render, which forms part of an External Insulated Facade System (EIFS) External Walling Insulation systems (EWI) that can be applied to many different substrates, providing a unique opportunity in flexibility of design.

A LOCAL MP has grilled the UK Government for answers on an energy efficient scandal which affected people across Renfrewshire.

5



Gavin Newlands, MP for Paisley and Renfrewshire North, held a debate in Westminster Hall this week on the UK Green Deal and highlighted the 3,000 Scottish households affected by the mis-selling of energy efficiency products by HELMS, which crashed into liquidation after being fined £200,000 by the Information Commissioner's Office last year for making more than six million nuisance calls.

Recent debate in Parliament





December 2015

Cavity wall insulation complaints – a review of CIGA complaints handling

- Shove warned of the dangers of poorly thought out retrofit techniques and cavity wall installation as far back as 1991. Her thorough study, which involved interviews with installers, and an extensive literature review, raised serious questions about how cavity wall insulation was developing, though it is hard to know if much attention was paid to her warnings.
-
- *“Most believe that the future success of cwi depends on **eliminating cowboys** and not inviting their return....its is difficult to believe that an invasion of appropriately guaranteed cowboys would really harm the cause of national energy efficiency.*
- *.....in practice rain exposure made hardly any difference to the industry. There were still doubts among BRE experts who take the line that cavities should still be cavities. “*
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- (Shove E. Filling the gap – The social and economic structure of the cavity wall industry. Institute for advanced architectural studies York 1991)



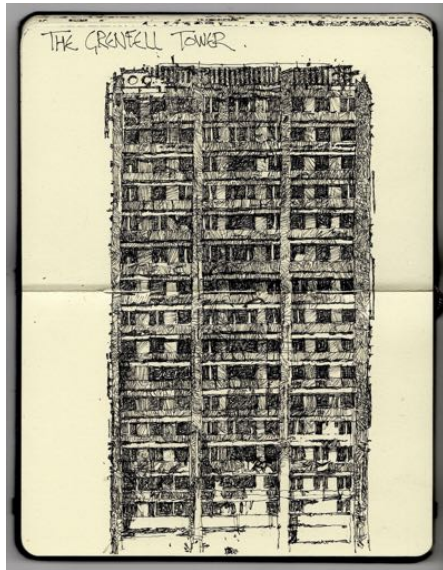
Homeowners Professionals Members About LABC News Awards Training BROWSE

News > BRE Report raises concerns over post installation performance of cavity wall and external wall insulation

BRE Report raises concerns over post installation performance of cavity wall and external wall insulation

18.01.2017 | News

Tower block retrofits even more ineffective and disastrous with almost no scientific data to back up claims



Geoff Green, David Ormandy, John Brazier, Jan Gilbertson. (2000) Tolerant Building: the impact of energy efficiency measures on living conditions and health status, in Fergus Nicol & Janet Rudge (editors) Cutting the Cost of Cold: Affordable Warmth for Healthier Homes. Spon Press. London.
in the UK and Europe there are refurbishments of 1960's tower blocks which achieve the three objectives of warm, damp-free and energy efficient homes, fully tolerating a spectrum of lifestyles

'Huge concentrations' of toxins found in Grenfell soil, study finds

Exclusive: Public Health England has not acted on early findings of report warning of potential carcinogens



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'WHEN THE FACADE COMES OFF' - THE WIDER IMPLICATIONS OF THE CLADDING AND INSULATION CRISIS

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AND CHELSEA

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Housing / Affordable warmth and energy efficiency in the home

Affordable warmth and energy efficiency in the home

Fuel poverty can affect anyone but most at risk are; single older households, single younger households, older couples and lone parents.

The Healthy Homes Hotline - 0808 202 6204 helps people who are having difficulty keeping their homes warm or keeping up with their energy bills.

Healthier Homes project

The Healthier Homes project has been set up with public health funding to assist residents living in homes that are cold, damp or dangerous and whose health may be put at risk.

More in Affordable warmth and energy efficiency in the home

- > Smoke and Carbon Monoxide Alarms Regulations
- > Healthier Homes Training
- > Houses in Multiple Occupation

View all

Also in Housing

- > Living in healthy homes

There is some good practice using non toxic and breathable materials but these are few and far between

WHISCERS™



Whole House In Situ Carbon and Energy Reduction Solution

Faster, better, cost-effective: low-mess wall insulation for hard-to-treat properties



Future Proofing Your House - A Co-operative Approach

Talk by **Jonathan Atkinson** from the **Carbon Co-op** in Manchester
Chaired by **Professor Tom Woolley**



Thursday October 4, 6pm
Room 00-021, Ground Floor University of Ulster York Street Belfast BT15 2ED
Refreshments

The need to renovate and insulate older houses is an important issue for society. As energy costs continue to grow and climate and weather patterns change we need to keep warm in the winter and cool in the summer. Northern Ireland has the highest level of fuel poverty in Europe. Tenants, landlords and home owners find it hard to get good advice about how to insulate and improve their houses. Even where grants are available, there is confusion about the best measures to take. Many houses suffer from damp and mould and poor indoor air quality. This event will provide an opportunity to learn from the excellent work of the Carbon Co-op and to discuss possible initiatives in Northern Ireland. It is supported by a number of leading organisations concerned about these issues, Bryson Energy, National Energy Action, Co-operative Alternatives and Belfast School of Architecture and the Built Environment

Come and learn about how to improve your house.

