NEW TRENDS IN VENTILATION SYSTEMS AND THE IMPACT ON IAQ, ENERGY PERFORMANCE AND THE INSTALLATION FITTER

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WHAT SHOULD A HEALTHY ENERGY EFFICIENT DWELLING OFFER?

- A dwelling with sufficient ventilation
- A cool house in the summer
- A dwelling with less exposure to contaminants
PRIORITIZING POLLUTANTS: ADVERSE HEALTH EFFECT

<table>
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<tr>
<th>Priority Pollutants for Chronic Exposure</th>
<th>Potential Acute Exposure Concerns</th>
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<tbody>
<tr>
<td>Acetaldehyde</td>
<td>Acrolein</td>
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<tr>
<td>Acrolein</td>
<td>Chloroform</td>
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<tr>
<td>Benzene</td>
<td>Carbon Monoxide</td>
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<tr>
<td>Butadiene, 1,3-</td>
<td>Formaldehyde</td>
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<tr>
<td>Dichlorobenzene, 1,4-</td>
<td>NO₂</td>
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<tr>
<td>Formaldehyde</td>
<td>PM₂.₅</td>
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<td>Naphthalene</td>
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15 POLLUTANTS WITH HIGHEST HEALTH AFFECT

- PM 2.5 10 times more effect as SHS
- Same order as traffic accidents
- Cooking can be an important source

Logue et al. 2011
Energy efficient measures to reduce PM2.5 emissions due to cooking

Too high concentration ineffective ventilation

4 hours!
PROBLEMS IN VENTILATION PERFORMANCE: IT FAILS DUE TO EXECUTION & DESIGN
A FIRST STEP IS TO SET REQUIREMENTS, SECOND TOUGH STEP IS REALIZING IT......

80% dwellings in NL flow rates fails

100% performance check is necessaire
HOW TO IMPROVE?

- Better design
- Better execution
- Inspection
- Education & Training

Performance contracting can be a driver
PERFORMANCE CONTRACTING FOR ENERGY AND INDOOR AIR QUALITY

What is Performance Contracting?

Schools and governments want to conserve water/energy and hire Performance Contractor

Performance Contractor does energy/water audit and guarantees financial savings after upgrades

School or government gets a loan from the bank to do energy/water upgrades

Performance contractor does energy/water upgrades. Money saved from upgrades pays for loan*

Schools and governments

Save energy
Save water
Save Money!
INNOVATIVE DESIGN:
VENTILATION SYSTEM INCLUDING RANGEHOOD

>90% efficiency

23 dB(A)
EFFECT OF FLOW ON CAPTURE EFFICIENCY

Extract ventilation kitchen 75 m³/h

4 times 300 m³/h

Simulaties: Andreas Mack, TNO
INNOVATIVE DESIGN: DEMAND CONTROL WITH MECHANICAL EXTRACT AND NATURAL SUPPLY
INNOVATIVE DESIGN: LOCAL HEAT RECOVERY IN LIVING, NATURAL SUPPLY AND MECHANICAL EXTRACT BEDROOMS
INNOVATIVE DESIGN: HEAT RECOVERY BALANCED VENTILATION WITH MIXING FANS
KEY POINT FOR PERFORMANCE CONTRACTING: TRAINING INSTALLATION FITTER
EU PROJECT NEWCOM: DEVELOPING EUROPEAN TRAINING SCHEMES

- Training ventilation fitters for Nearly Zero Energy Buildings and performance contracting (NZEB)

- Ventilation fitters will be qualified to ensure the energy standard qualities.

- Status: Specifying the needed skills and knowledge for fitters
THANKS FOR YOUR ATTENTION

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