Identifying criteria for environmental risk assessment models at different stage-gates of nano-material/product innovation considering requirements of various stakeholders

General information
State: Published
Organisations: Physics, Research area: Aerosol Physics, Research group: The Instrumentation, Emissions, and Atmospheric Aerosols Group
Authors: Sørensen, S. N., Hansen, S. F., Baun, A., Spurgeon, D., Matzke, M., Schirmer, K., Burkard, M., Dal Maso, M., Poikkimäki, M., Verschoor, A., Quik, J., Peijnenburg, W., Wigger, H., Nowack, B.
Publication date: 2017
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Research output: Scientific › Paper, poster or abstract

Kirja-arviointi: Kuinka vesiensuojelu saatiin pääosin pääläisten kuntoon?

General information
State: Published
Ministry of Education publication type: B1 Article in a scientific magazine
Organisations: Civil Engineering
Authors: Katko, T. S.
Number of pages: 2
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Peer-reviewed: No
Glazed spaces: A simplified calculation method for the evaluation of energy savings and interior temperatures

Previous studies have shown that temperatures inside glazed balconies are almost without exception higher than those of outside air. This is due to the space's ability to capture and store the building's heat losses and solar radiation. The interior temperatures and energy saving effects of glazed balconies are, however, not particularly good in Finland, because the implemented solutions are not optimized for these issues. The purpose of this study is to introduce simplified evaluation methods for the energy saving and interior air temperature evaluation of glazed spaces and to verify the method reliably with the help of measured and simulated values of typical Finnish 1970s apartment blocks. The presented method can be used for optimizing and showing the energy saving impact as well as the mean, maximum and minimum temperatures of different type of glazed spaces in the preliminary design stage. The results show that the accuracy of the method is sufficient for designing if nine parameters are changed at most. The accuracy is affected by the number of changes made in relation to the typical 1970s apartment blocks in Finland, which was chosen as a starting point for the method's development.
Building Codes and Demand Response of Energy Use

Buildings are an essential part of the wider energy system. A significant share of electricity consumption occurs in buildings. Traditionally buildings have been places where electricity is consumed. Now they have a growing role also as a location where renewable energy production, such as solar power, occurs.

Demand response means the voluntary actions that are taken on the customer side as a response to something on the demand side. In practice, demand response can involve, for example, reducing the energy consumption during the peak times of the larger energy system or shifting the timing of the building’s energy consumption by synchronizing it with local renewable energy production’s profile inside the building. The building codes of Finland direct the designers’ energy-related solutions both in new construction and licenced renovations.

In this conceptual paper the literature related to demand response and regulation is reviewed, and it is discussed what kind of a role the building codes could have in advancing the buildings' preconditions for demand response. Demand response is currently brought out in EU directives in the regulation with relation to network operators. However, preparedness for demand response could also be advanced by giving more attention to the timing of power use in the building codes.

General information

State: Published
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Organisations: Department of Civil Engineering, Research group: Construction Processes, Research group: Life-cycle Economics, Department of Electrical Engineering, Research area: Power engineering
Authors: Sorri, J., Heljo, J., Järventausta, P., Honkapuro, S., Harsia, P.
Number of pages: 14
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Volume: 4
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Editors: Nenonen, S., Junnonen, J.
Keywords: building codes, demand response, energy law, energy use, power
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Research output: Scientific - peer-review › Conference contribution

Teollisten nanohiukkasten ympäristöriskejien arviointi

In the 21st century, increasing number of nanoscale materials such as engineered nanoparticles (ENP) are produced for various industrial applications and everyday products. However, recent studies have shown that some ENPs may cause adverse effects on human health and the environment, thus a need to assess and govern risks has arisen, to ensure development and production of low-risk products containing ENPs. In order to reliably assess the risks, analytical measurement methods are needed, along with modeling methods that take into account the processes ENPs undergo in the nature. Present risk assessment models do not sufficiently consider the processes affecting ENPs after they are released into the atmosphere.

In this Master’s thesis, how the effect of possible atmospheric processes can be considered in assessments of the environmental and health risks of ENPs is studied. A Gaussian atmospheric dispersion model is proposed to model the behavior and fate of ENPs after their release into the atmosphere. The model is developed to compute exposure estimates to be used in risk assessment. Additionally, a SimpleBox4Nano- model, found during the literature review, is recommended as an exemplary model that takes into account some of the atmospheric processes. The thesis focuses
also on how the uncertainty that is present in the current models can be reduced through sensitivity analysis. A sensitivity testing was performed for the dispersion model considered in this thesis and it was found that exposure estimates change the most when model input parameters such as particle mass, particle size, atmospheric stability class, wind speed and size of the particle plume are varied. This kind of sensitivity testing could be a way to increase accuracy and reliability of the current risk assessment models.

Assessment of indoor environmental quality in existing multi-family buildings in North-East Europe
Sixteen existing multi-family buildings (94 apartments) in Finland and 20 (96 apartments) in Lithuania were investigated prior to their renovation in order to develop and test out a common protocol for the indoor environmental quality (IEQ) assessment, and to assess the potential for improving IEQ along with energy efficiency. Baseline data on buildings, as well as data on temperature (T), relative humidity (RH), carbon dioxide (CO2), carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO2), formaldehyde, volatile organic compounds (VOCs), radon, and microbial content in settled dust were collected from each apartment. In addition, questionnaire data regarding housing quality and health were collected from the occupants. The results indicated that most measured IEQ parameters were within recommended limits. However, different baselines in each country were observed especially for parameters related to thermal conditions and ventilation. Different baselines were also observed for the respondents’ satisfaction with their residence and indoor air quality, as well as their behavior related to indoor environment. In this paper, we present some evidence for the potential in improving IEQ along with energy efficiency in the current building stock, followed by discussion of possible IEQ indicators and development of the assessment protocol. (C) 2015 Elsevier Ltd. All rights reserved.
Development of an assessment protocol: the impact of energy retrofits on indoor environmental quality and public health in the existing building stock

General information
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Organisations: Department of Civil Engineering, Research group: Structures and Their Behaviour, Research area: Structural Engineering, Research group: Building Physics and Acoustics, Kaunas Univ Technol, Kaunas University of Technology, Dept Environm Technol, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth
Authors: Du, L., Leivo, V., Kiviste, M., Martuzevicius, D., Turunen, M., Prasauskas, T., Haverinen-Shaughnessy, U.
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Research output: Scientific - peer-review → Conference contribution
Betonielementtien uudelleenkäyttömahdollisuudet

Finnish mines. The method was developed based on the stress test designed for nuclear power plants by the European Nuclear Safety Regulators Group (ENSREG). Altogether twenty-one mines or concentrating plants were chosen to be tested, and twenty responded. In the stress test questionnaire there were fifteen questions on seven risk scenarios that the nominated expert group assessed to be both potential and significant. There are sixty-seven tailings dams in Finland. Nine of them have been classified as Class 1 ("consequence class"), that is, dams which could cause loss of life in the event of dam failure. The study showed that the hydrological design of tailings dams has to be reconsidered. One finding of the stress test was that the dam safety legislation and the guidelines do not define criteria for the closure of tailings dams. Based on the results, mining companies are monitoring their dams quite well and are aware of dam safety risks, probably thanks to the detailed dam safety legislation. However, the base of the waste areas is typically ignored. Old mining waste areas are mainly built on natural soil layer without any liners. New mining waste areas require an environmental permit, which contains requirements for the bottom liners as well.

General information
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Organisations: Department of Civil Engineering, Research group: Earth Constructions
Authors: Leppänen, M., Laasonen, J., Välisalo, T.
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Liite 6: Yleistä kaivannaisjättealueista ja patoturvallisuudesta

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Authors: Leppänen, M., Välisalo, T. (ed.), Laasonen, J.
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http://www.ym.fi/fi-FI/Ajankohtaista/Julkaisut/YMra_22014_Kaivosten_stressitestit_2013%2828221%29
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Water and Sanitation Research in Tampere, Finland

General information
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Authors: Juuti, P., Katko, T. S.
Publication date: 2005
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