

Performance Gap and near Zero Energy Buildings Compliance of Monitored Passivhaus in Northern Ireland, the Republic of Ireland and Italy

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Abstract : The near Zero Energy Building (nZEB) standard is required for all buildings from 2020. The Passive House (PH) standard is a well-established low-energy building standard, having been designed over 25 years ago, and could potentially be used to achieve the nZEB standard in combination with renewables. By comparing measured performance with design predictions, this paper considers if there is a performance gap for a number of monitored properties and assesses if the nZEB standard can be achieved by following the well-established PH scheme. Analysis is carried out based on monitoring results from real buildings located in Northern Ireland, the Republic of Ireland and Italy respectively, with particular focus on the indoor air quality including the assumed and measured indoor temperature and heating periods for both standards as recorded during a full annual cycle. An analysis is carried out also on the energy performance certificates of each of the dwellings to determine if they meet the near Zero Energy Buildings primary energy consumption targets set in the respective jurisdictions. Each of the dwellings is certified as complying with the passive house standard, and accordingly have very good insulation levels, heat recovery and ventilation systems of greater than 75% efficiency and an airtightness of less than 0.6 air changes per hour at 50 Pa. It is found that indoor temperature and relative humidity were within the comfort boundaries set in the design stage, while carbon dioxide concentrations are sometimes higher than the values suggested by EN 15251 Standard for comfort class I especially in bedrooms.

Keywords : monitoring campaign, nZEB (near zero energy buildings), Passivhaus, performance gap

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