Changes in heat load profile of typical Danish multi-storey buildings when energy-renovated and supplied with low-temperature district heating

Denmark has a long-term objective of being free of fossil fuels by 2050, with the energy supply mix for buildings being fossil-free by 2035. Energy consumption for existing buildings needs to be decreased concurrent with the conversion from fossil-fuel supply to renewable-energy (RE) supply. When end-use savings are implemented in buildings concurrent with the application of low-temperature district heating (LTDH), the heat profiles of the buildings will change. Reducing peak loads is important, since this is the dimensioning foundation for future district heating systems. To avoid oversized RE-based capacity, a long-term perspective needs to be taken. Applying LTDH in existing buildings without changing the heating system implies reduced radiator performance, so it is of great importance that acceptable comfort temperatures can still be provided. The results indicate that it is possible to apply LTDH most of the year without compromising on thermal comfort if energy renovation is also implemented.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Building Physics and Services
Contributors: Harrestrup, M., Svendsen, S.
Pages: 232-247
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: International Journal of Sustainable Energy
Volume: 34
ISSN (Print): 1478-6451
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 1.17 SJR 0.471 SNIP 0.531
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.92 SJR 0.414 SNIP 0.719
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 0.63 SJR 0.346 SNIP 0.509
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 0.73 SJR 0.351 SNIP 0.568
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 0.88 SJR 0.337 SNIP 0.727
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 0.99 SJR 0.503 SNIP 0.795
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 0.75 SJR 0.268 SNIP 0.592
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.212 SNIP 0.429
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.136 SNIP 0.215
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.223 SNIP 0.313
Scopus rating (2007): SJR 0.191 SNIP 0.527
Scopus rating (2006): SJR 0.201 SNIP 0.884
Scopus rating (2005): SJR 0.231 SNIP 0.611
Scopus rating (2004): SJR 0.107 SNIP 0.045