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Corrigendum to “Energy savings across EU domestic building stock by optimizing hydraulic distribution in domestic space heating systems”

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Corrigenda to:

Energy and Buildings [ENB_91C (2015_ 199-209]

Energy savings across EU domestic building stock by optimizing hydraulic distribution in domestic space heating systems

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ABSTRACT

The objective of this work is to quantify the resultant savings across the EU from the optimization of existing system components in domestic space heating distribution systems to maintain comfort levels. Heat energy savings are shown to range from 1% to 19% depending on dwelling type, age, location and initial specific heat energy consumption. Total potential savings across the sector amount 10 Mtoe, a reduction of 3.24 %; 87 % of these from a reduction in pumping power required by heating distribution systems and 13 % of these from a reduction in the heat energy consumed by heating systems. The carbon abatement potential is estimated to be 27.2 million tonnes of CO_2 equivalent. Regulatory changes to the domestic replacement and maintenance industry are required for these low-cost, high impact and highly applicable energy saving measures to be adopted more extensively.

4.0 Results

The heat energy saving potential resulting are presented in Figs 15 and 16. The total heat energy savings potential of heating system optimization across the EU 27 is in the region 8.7 Mtoe or 101 TWh, which amounts to circa19.19 million tonnes of CO_2 equivalent assuming 0.19 kg of CO_2 per is produced per kWh of heat energy production [46]. The analysis indicates a potential to reduce the heat energy consumption of European dwellings by an average of4.14 %, equating to an overall reduction of 2.82 % across the sector. Shown in Fig. 15, are the savings by country.

The potential savings resulting from reduction in pump power required by the heat distribution system amount to 5.8 TWh, which, when a primary energy conversion factor of 2.6 is applied [47]; results in a primary energy saving of 15.08 TWh or 1.3 Mtoe. This equates to 8 million tonnes of CO_2 equivalent assuming 0.53 kg of CO_2 per is produced per kWh of electrical energy production [46]. The resultant saving indicates a potential reduction in primary electrical energy across the sector of 0.42%.

Total potential savings across the sector amount 10 Mtoe (- 3.24 % across the sector), 87 % from savings in electrical energy and 13 % from heat energy consumption. The carbon abatement potential is estimated to be 27.2 million tonnes of CO_2 equivalent. As shown in Fig. 17, the results are significant due to the relative energy consumption of the sector being so large (68 %). As shown in Fig. 18, heat energy saving potential across the EU 27 is limited by the fact that 67 % of the European

dwelling stock was constructed prior to 1980 where no savings are apparent from the optimization process.

Fig. 15

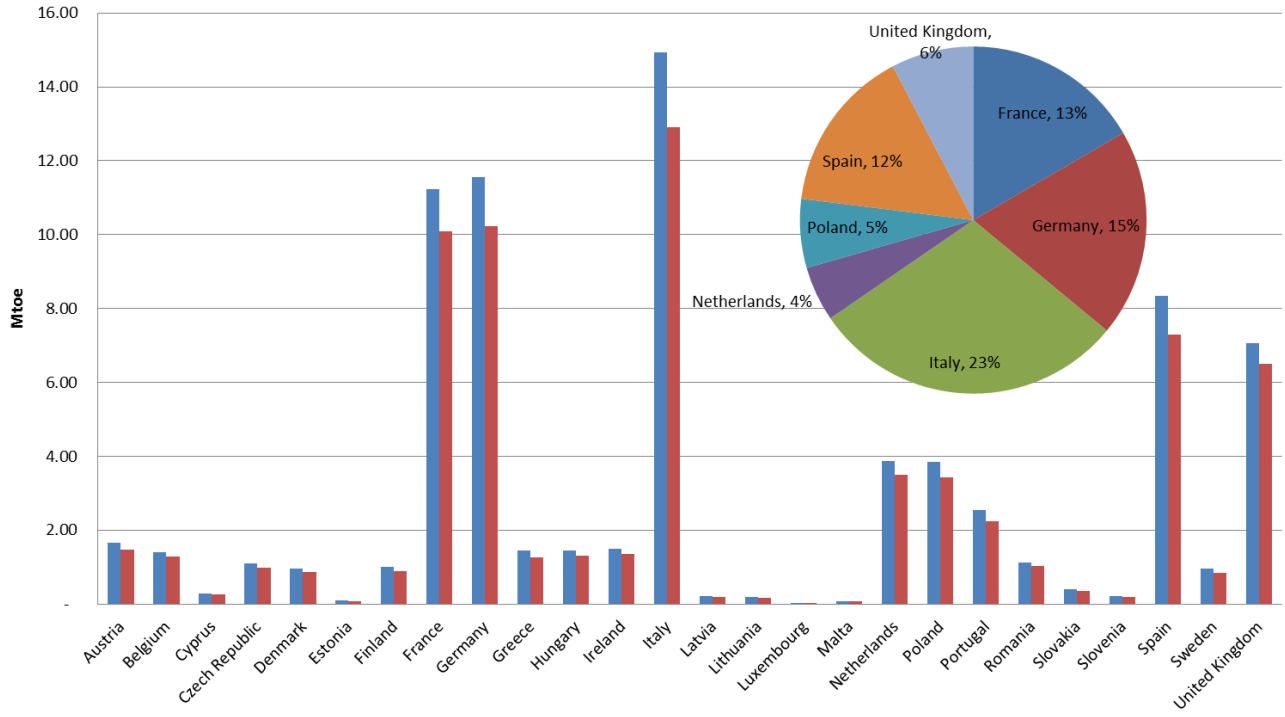


Fig. 16

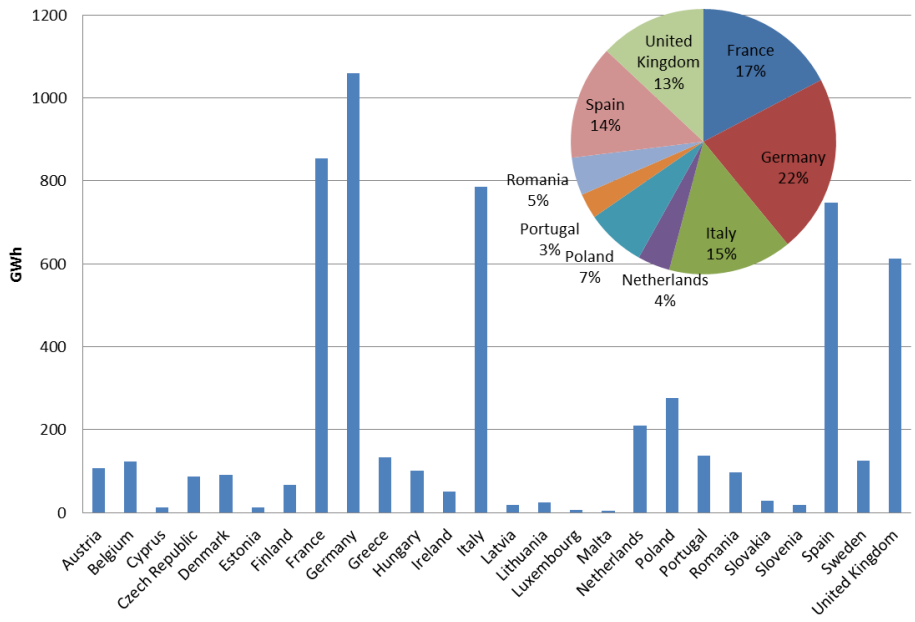
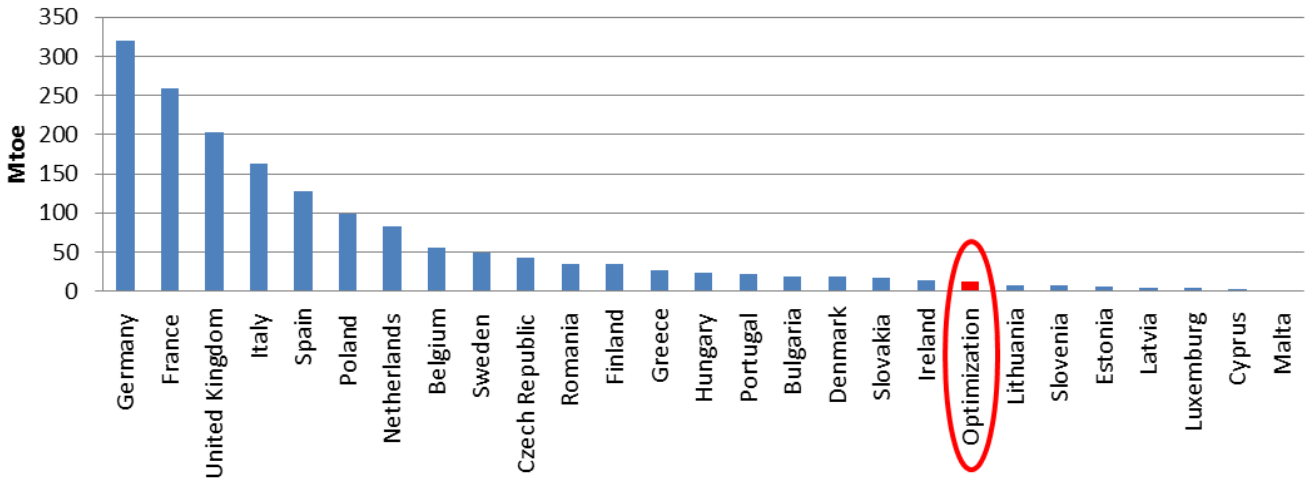


Fig. 17


Mtoe
350
300
250
200
150
100
50
0
Germany
France
United Kingdom
Italy
Spain
Poland
Netherlands
Belgium
Sweden
Czech Republic
Romania
Finland
Greece
Hungary
Portugal
Bulgaria
Denmark
Slovakia
Ireland
Optimization
Lithuania
Slovenia
Estonia
Latvia
Luxemburg
Cyprus
Malta