New Build Heating & Hot Water Costs



Introduction

- This document shows the annual and weekly heating costs of different technologies in new build homes
- Heating costs are produced for different housing types built by different property developers
- Various parameters are used to model heating costs including:
 - Fuel cost
 - Energy demand
 - Energy consumption
 - Efficiency of technology
 - Carbon intensity of fuel source
- LPG is compared against various fuel sources including electricity, gas and oil
- LPG weekly costs are compared against a social households weekly income to see if the household would be in fuel poverty if it were to use LPG as a heating source.

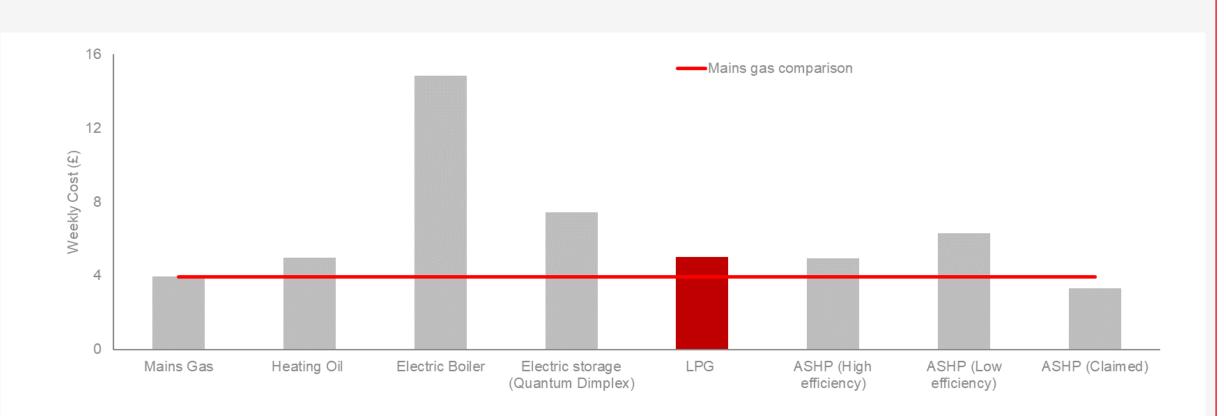
2 Bed Flat (G/F) – Persimmon (Charles Church)

| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|---|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| Persimmon (Charles Church) - 2 bed - Fl | lat (G/F) | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 4,301 | 0.92 | 4,675 | 204.76 | 3.94 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 4,301 | 0.88 | 4,887 | 259.23 | 4.99 |
| Electric Boiler | | | 17.92 | 0.352 | 4,301 | 1.00 | 4,301 | 770.67 | 14.82 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 4,301 | 1.00 | 4,301 | 385.36 | 7.41 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 4,301 | 0.92 | 4,675 | 261.15 | 5.02 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 4,301 | 3.00 | 1,434 | 256.89 | 4.94 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 4,301 | 2.36 | 1,822 | 326.55 | 6.28 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 4,301 | 4.50 | 956 | 171.26 | 3.29 |

- > 2 Bed Flat (G/F), Persimmon (Charles Church) 'Brockeridge Paddocks', Twyning, Gloucestershire, GL20 6DE
- > Total floor area (ground + first floor) = $54.4m^2$



2 Bed Flat (G/F) – Persimmon (Charles Church)



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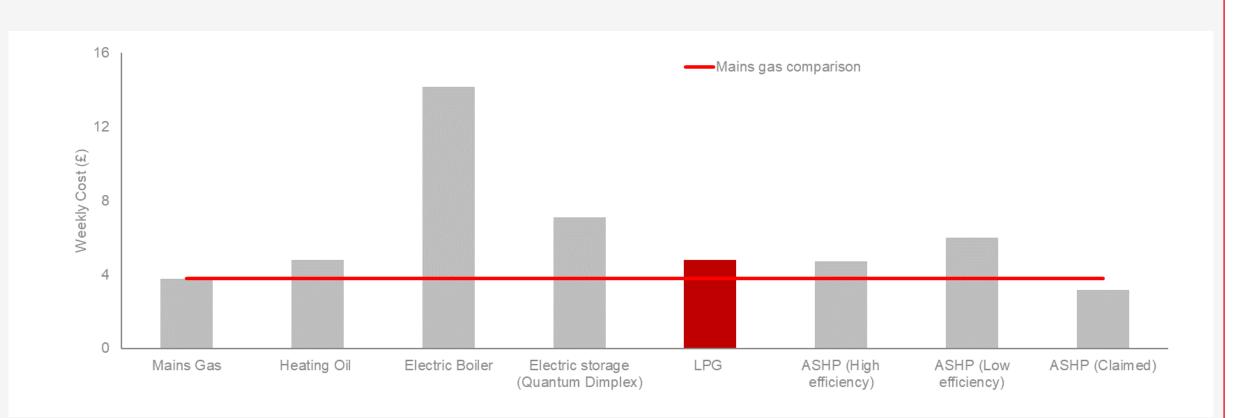
2 Bed Flat (F/F) – Persimmon (Charles Church)

| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|---|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| Persimmon (Charles Church) - 2 bed - Fl | at (1st floor) | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 4,112 | 0.92 | 4,470 | 195.78 | 3.76 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 4,112 | 0.88 | 4,673 | 247.85 | 4.77 |
| Electric Boiler | | | 17.92 | 0.352 | 4,112 | 1.00 | 4,112 | 736.85 | 14.17 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 4,112 | 1.00 | 4,112 | 368.45 | 7.09 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 4,112 | 0.92 | 4,470 | 249.69 | 4.80 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 4,112 | 3.00 | 1,371 | 245.62 | 4.72 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 4,112 | 2.36 | 1,742 | 312.22 | 6.00 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 4,112 | 4.50 | 914 | 163.74 | 3.15 |

- > 2 Bed Flat (1st floor), Persimmon (Charles Church) 'Brockeridge Paddocks', Twyning, Gloucestershire, GL20 6DE
- > Total floor area (ground + first floor) = $54.4m^2$



2 Bed Flat (F/F) – Persimmon (Charles Church)



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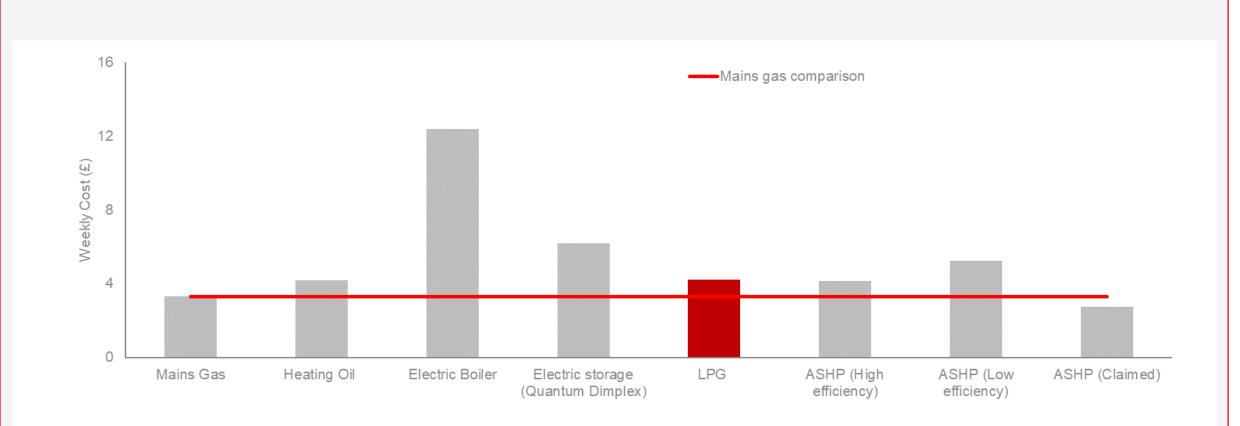
2 Bed Mid-terrace Home – Bellway Homes

| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|--|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| Bellway Homes - 2 bed - mid terrace - Th | ne Ash | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 3,596 | 0.92 | 3,909 | 171.26 | 3.29 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 3,596 | 0.88 | 4,087 | 216.75 | 4.17 |
| Electric Boiler | | | 17.92 | 0.352 | 3,596 | 1.00 | 3,596 | 644.39 | 12.39 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 3,596 | 1.00 | 3,596 | 322.22 | 6.20 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 3,596 | 0.92 | 3,909 | 218.36 | 4.20 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 3,596 | 3.00 | 1,199 | 214.80 | 4.13 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 3,596 | 2.36 | 1,524 | 273.05 | 5.25 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 3,596 | 4.50 | 799 | 143.20 | 2.75 |

- > 'The Ash' 2 bed Mid-terrace Home, Bellway Homes 'Showfields', Haydon Bridge, Northumberland, NE47 6DG
- > Total floor area (ground + first floor) = $58.48m^2$



2 Bed Mid-terrace – Bellway Homes



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2 Bed Semi-detached – Persimmon (Charles Church)

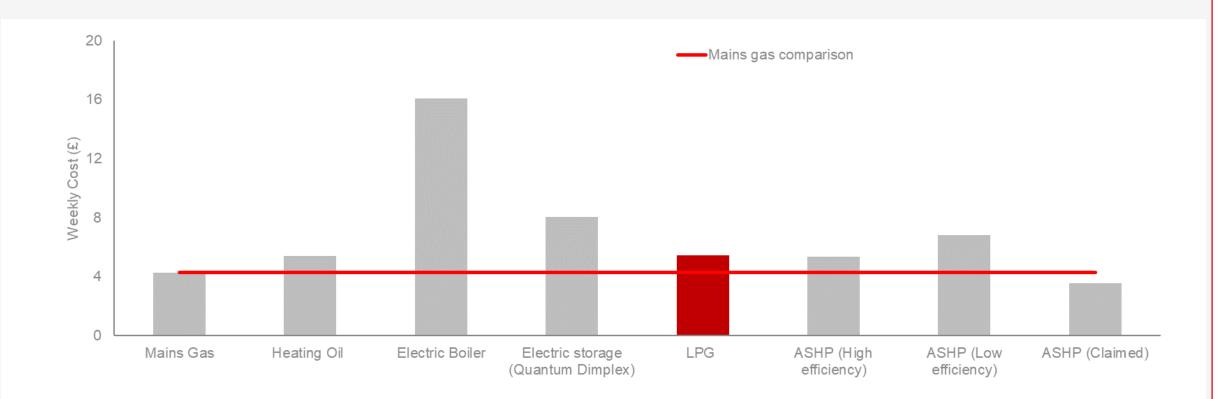
| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|--|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| Persimmon (Charles Church) - 2 bed - s | emi-detached - Tr | afalgar | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 4,669 | 0.92 | 5,075 | 222.27 | 4.27 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 4,669 | 0.88 | 5,305 | 281.39 | 5.41 |
| Electric Boiler | | | 17.92 | 0.352 | 4,669 | 1.00 | 4,669 | 836.57 | 16.09 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 4,669 | 1.00 | 4,669 | 418.31 | 8.04 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 4,669 | 0.92 | 5,075 | 283.48 | 5.45 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 4,669 | 3.00 | 1,556 | 278.86 | 5.36 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 4,669 | 2.36 | 1,978 | 354.48 | 6.82 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 4,669 | 4.50 | 1,037 | 185.90 | 3.58 |

Running cost information based on:

- 'Trafalgar', 2 Bed Semi-detached Home, Persimmon (Charles Church), 'Brockeridge Paddocks', Twyning, Gloucestershire, GL20
 6DE
- > Total floor area (ground + first floor) = $63.29m^2$

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2 Bed Semi-detached – Persimmon (Charles Church)



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3 Bed Semi-detached Home – Taylor Wimpey

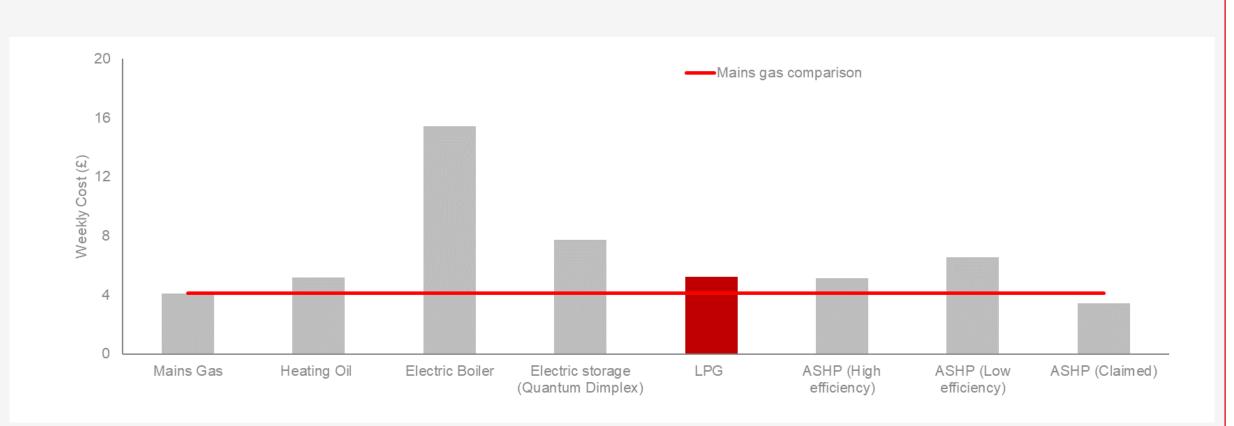
| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|---------------------------------------|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| Taylor Wimpey - 3 bed - semi-detached | - The Gosford | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 4,478 | 0.92 | 4,867 | 213.17 | 4.10 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 4,478 | 0.88 | 5,088 | 269.87 | 5.19 |
| Electric Boiler | | | 17.92 | 0.352 | 4,478 | 1.00 | 4,478 | 802.32 | 15.43 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 4,478 | 1.00 | 4,478 | 401.19 | 7.72 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 4,478 | 0.92 | 4,867 | 271.87 | 5.23 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 4,478 | 3.00 | 1,493 | 267.44 | 5.14 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 4,478 | 2.36 | 1,897 | 339.96 | 6.54 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 4,478 | 4.50 | 995 | 178.29 | 3.43 |

Running cost information based on:

- > 'The Gosford', 3 Bed Semi-detached Home, Taylor Wimpey 'The Lees', Sellindge, Kent, TN25 6JD
- > Total floor area (ground + first floor) = $80.46m^2$



3 Bed Semi-detached – Taylor Wimpey



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3 Bed Semi-detached Home – Bellway Homes

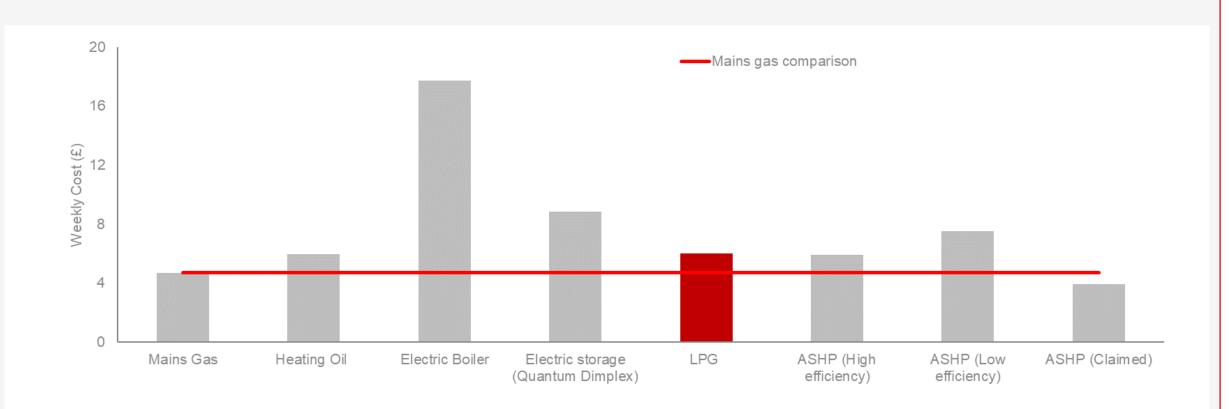
| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|---------------------------------------|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| Bellway Homes - 3 bed - semi-detached | - The Chestnut | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 5,143 | 0.92 | 5,590 | 244.90 | 4.71 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 5,143 | 0.88 | 5,844 | 309.96 | 5.96 |
| Electric Boiler | | | 17.92 | 0.352 | 5,143 | 1.00 | 5,143 | 921.49 | 17.72 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 5,143 | 1.00 | 5,143 | 460.78 | 8.86 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 5,143 | 0.92 | 5,590 | 312.25 | 6.00 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 5,143 | 3.00 | 1,714 | 307.16 | 5.91 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 5,143 | 2.36 | 2,179 | 390.46 | 7.51 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 5,143 | 4.50 | 1,143 | 204.78 | 3.94 |

Running cost information based on:

- > 'The Chestnut', 3 Bed Semi-detached Home, Bellway Homes 'Showfields', Haydon Bridge, Northumberland, NE47 6DG
- > Total floor area (ground + first floor) = $84.12m^2$



3 Bed Semi-detached – Bellway Homes



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3 Bed Detached Home – Taylor Wimpey

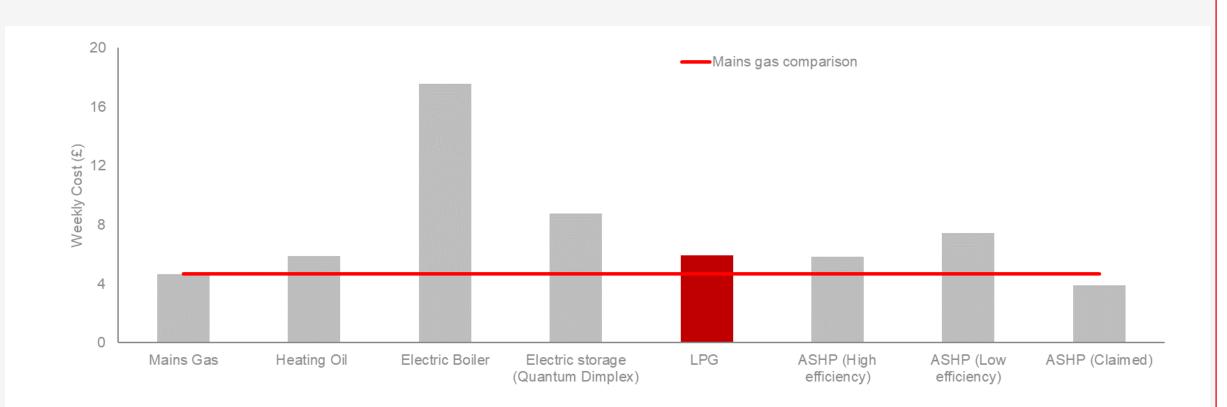
| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|--|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| Taylor Wimpey - 3 bed - detached - The | Easdale | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 5,091 | 0.92 | 5,534 | 242.38 | 4.66 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 5,091 | 0.88 | 5,785 | 306.85 | 5.90 |
| Electric Boiler | | | 17.92 | 0.352 | 5,091 | 1.00 | 5,091 | 912.26 | 17.54 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 5,091 | 1.00 | 5,091 | 456.16 | 8.77 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 5,091 | 0.92 | 5,534 | 309.12 | 5.94 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 5,091 | 3.00 | 1,697 | 304.09 | 5.85 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 5,091 | 2.36 | 2,157 | 386.55 | 7.43 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 5,091 | 4.50 | 1,131 | 202.72 | 3.90 |

Running cost information based on:

- 'The Easdale', 3 Bed Detached Home, Taylor Wimpey 'The Lees', Sellindge, Kent, TN25 6JD
- > Total floor area (ground + first floor) = $86.52m^2$



3 Bed Detached Home – Taylor Wimpey



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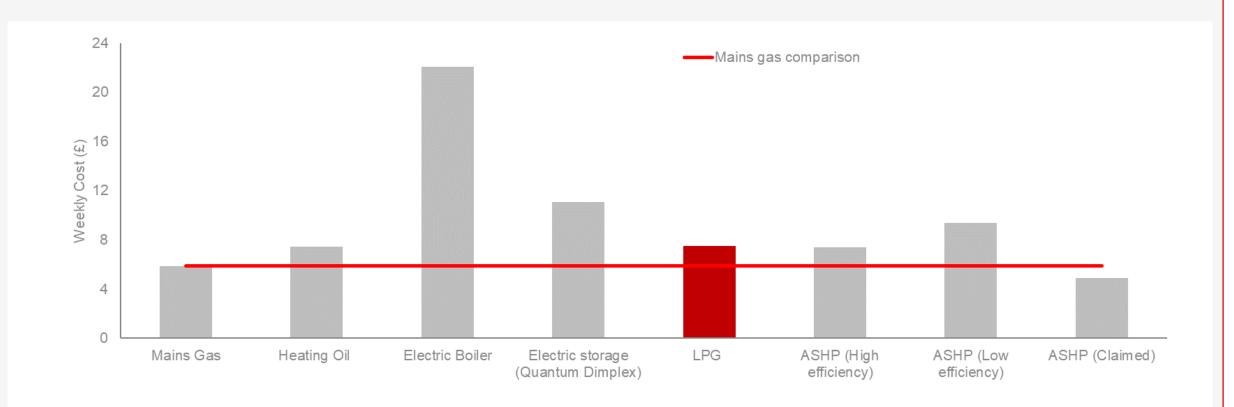
4 Bed Detached Home – Anwyl Homes

| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|---|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| Anwyl Homes - 4 bed - detached - The Al | bersoch | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 6,413 | 0.92 | 6,970 | 305.30 | 5.87 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 6,413 | 0.88 | 7,287 | 386.52 | 7.43 |
| Electric Boiler | | | 17.92 | 0.352 | 6,413 | 1.00 | 6,413 | 1,149.09 | 22.10 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 6,413 | 1.00 | 6,413 | 574.59 | 11.05 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 6,413 | 0.92 | 6,970 | 389.38 | 7.49 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 6,413 | 3.00 | 2,138 | 383.03 | 7.37 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 6,413 | 2.36 | 2,717 | 486.90 | 9.36 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 6,413 | 4.50 | 1,425 | 255.35 | 4.91 |

- > 'The Abersoch', 4 Bed Detached Home, Anwyl Homes 'Heathfields', Audlem, Cheshire, CW3 0HZ
- > Total floor area (ground + first floor) = 99.96m2



4 Bed Detached Home – Anwyl Homes



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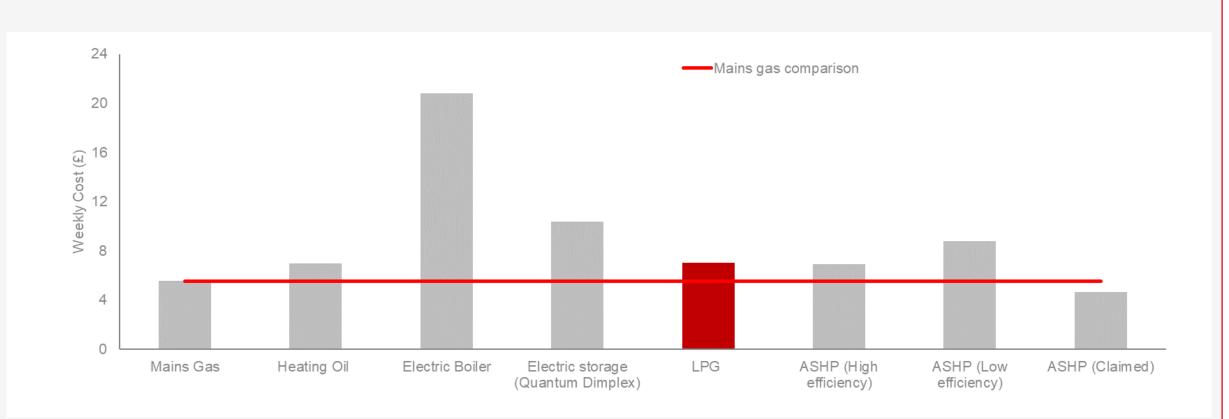
4 Bed Detached Home – Bellway Homes

| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|--|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| Bellway homes - 4 bed - detached - The | Laurel | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 6,033 | 0.92 | 6,558 | 287.25 | 5.52 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 6,033 | 0.88 | 6,856 | 363.65 | 6.99 |
| Electric Boiler | | | 17.92 | 0.352 | 6,033 | 1.00 | 6,033 | 1,081.13 | 20.79 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 6,033 | 1.00 | 6,033 | 540.60 | 10.40 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 6,033 | 0.92 | 6,558 | 366.35 | 7.05 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 6,033 | 3.00 | 2,011 | 360.38 | 6.93 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 6,033 | 2.36 | 2,557 | 458.11 | 8.81 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 6,033 | 4.50 | 1,341 | 240.25 | 4.62 |

- > 'The Laurel' 4 Bed Detached Home, Bellway Homes 'Showfields', Haydon Bridge, Northumberland, NE47 6DG
- Total floor area (ground + first floor) = $100.4m^2$



4 Bed Detached Home – Bellway Homes



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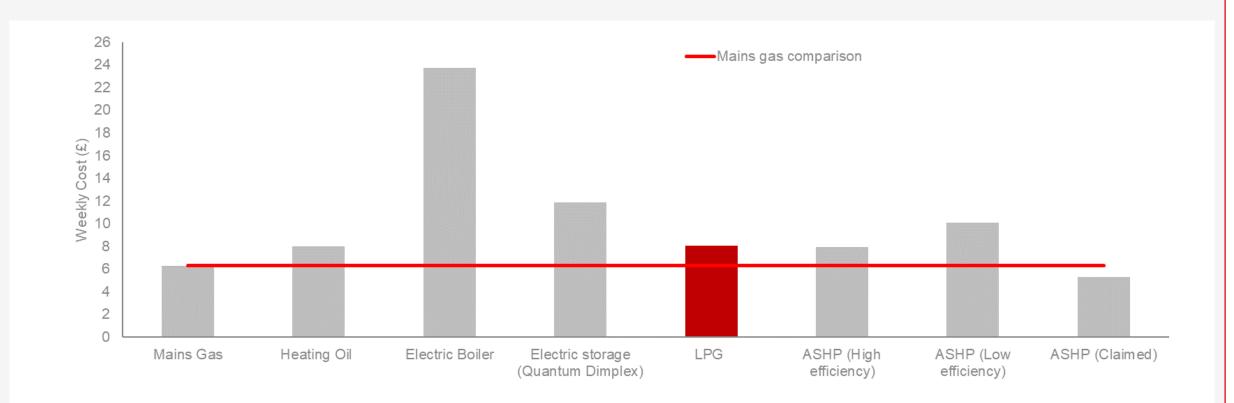
4 Bed Detached Home – Anwyl Homes

| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|---|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| Anwyl Homes - 4 bed - detached - The Ba | la | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 6,892 | 0.92 | 7,492 | 328.14 | 6.31 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 6,892 | 0.88 | 7,832 | 415.43 | 7.99 |
| Electric Boiler | | | 17.92 | 0.352 | 6,892 | 1.00 | 6,892 | 1,235.04 | 23.75 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 6,892 | 1.00 | 6,892 | 617.56 | 11.88 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 6,892 | 0.92 | 7,492 | 418.50 | 8.05 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 6,892 | 3.00 | 2,297 | 411.68 | 7.92 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 6,892 | 2.36 | 2,921 | 523.32 | 10.06 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 6,892 | 4.50 | 1,532 | 274.45 | 5.28 |

- > 'The Bala', 4 Bed Detached Home, Anwyl Homes 'Heathfields', Audlem, Cheshire, CW3 0HZ
- > Total floor area (ground + first floor) = $115m^2$



4 Bed Detached Home – Anwyl Homes

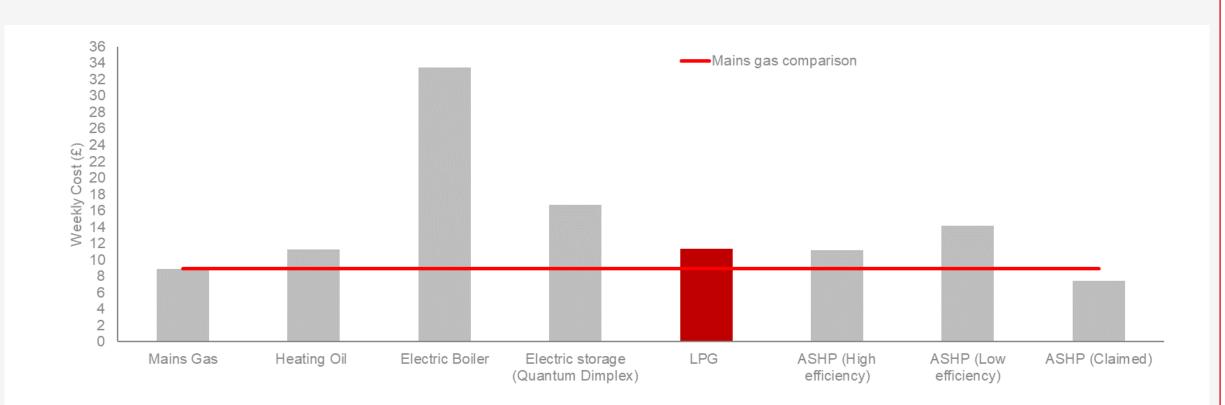


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| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|---------------------------------------|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| BDW (David Wilson) - 5 bed - detached | - Henley | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 9,707 | 0.92 | 10,551 | 462.13 | 8.89 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 9,707 | 0.88 | 11,031 | 585.06 | 11.25 |
| Electric Boiler | | | 17.92 | 0.352 | 9,707 | 1.00 | 9,707 | 1,739.35 | 33.45 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 9,707 | 1.00 | 9,707 | 869.73 | 16.73 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 9,707 | 0.92 | 10,551 | 589.39 | 11.33 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 9,707 | 3.00 | 3,236 | 579.78 | 11.15 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 9,707 | 2.36 | 4,113 | 737.01 | 14.17 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 9,707 | 4.50 | 2,157 | 386.52 | 7.43 |

- 'Henley', 5 Bed Detached Home, BDW (David Wilson) 'Doveridge Park', Doveridge, Ashbourne, Derbyshire, DE6 5LW
- Total floor area (ground + first floor) = <u>182.41m2</u>

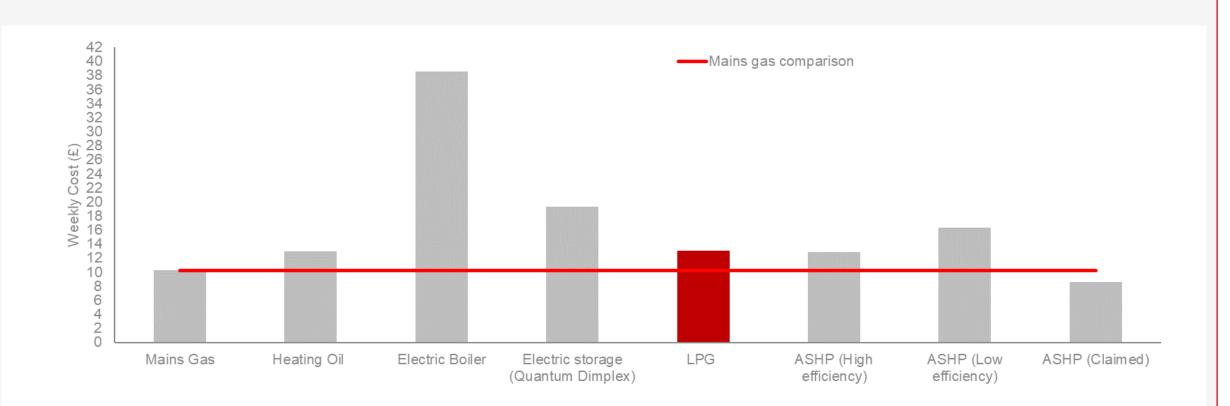




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| Fuel Type | Cost (ppLitre) | kWh/litre | Cost (p/kWh) | CO2 Emissions (CO2/kWh) | Heating & Hot Water Demand (kWh/year) | System Efficiency | Fuel Consumption (kWh/year) | Cost (£/Year) | Cost (£/week) |
|---------------------------------------|-------------------|-----------|-----------------|----------------------------|---|----------------------|--------------------------------|------------------|------------------|
| BDW (David Wilson) - 5 bed - detached | - Moorecroft | | | | | | | | |
| Mains Gas | | | 4.38 | 0.184 | 11,193 | 0.92 | 12,166 | 532.88 | 10.25 |
| Heating Oil | 53.04 | 10.00 | 5.30 | 0.245 | 11,193 | 0.88 | 12,719 | 674.62 | 12.97 |
| Electric Boiler | | | 17.92 | 0.352 | 11,193 | 1.00 | 11,193 | 2,005.62 | 38.57 |
| Electric storage (Quantum Dimplex) | | | 8.96 | 0.352 | 11,193 | 1.00 | 11,193 | 1,002.88 | 19.29 |
| LPG | 39.55 | 7.08 | 5.59 | 0.214 | 11,193 | 0.92 | 12,166 | 679.62 | 13.07 |
| ASHP (High efficiency) | | | 17.92 | 0.352 | 11,193 | 3.00 | 3,731 | 668.54 | 12.86 |
| ASHP (Low efficiency) | | | 17.92 | 0.352 | 11,193 | 2.36 | 4,743 | 849.84 | 16.34 |
| ASHP (Claimed) | | | 17.92 | 0.352 | 11,193 | 4.50 | 2,487 | 445.69 | 8.57 |

- 'Moorecroft', 5 Bed Detached Home, BDW (David Wilson) 'Doveridge Park', Doveridge, Ashbourne, Derbyshire, DE6 5LW
- Total floor area (ground + first floor) = $226.31m^2$



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Fuel Poverty & Social Housing

- A household is considered to be fuel poor if: they have required fuel costs that are above average (national median level); and, were they to spend that amount, they would be left with a residual income below the official poverty line (60% of median UK household income). (<u>BEIS 2018</u>)
- One measure of fuel poverty is the **10% definition**:

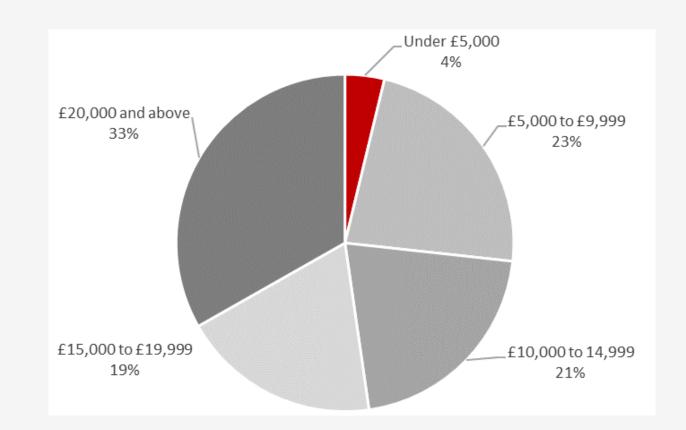
"a household is considered to be fuel poor if **they are required to spend more than 10% of their income on fuel**, so as to maintain an adequate standard of warmth". (BEIS 2018)

- Therefore, in order to be a viable fuel source for social housing tenants, the weekly cost of heating with LPG must not represent over 10% of a tenants weekly income.
- Other definitions include the Low-Income High Cost (LIHC) a dual indicator, which allows
 measurement of both the level (number of households) and depth (fuel poverty gap) of fuel poverty.

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• For simplification purposes, we **consider the 10% definition**.

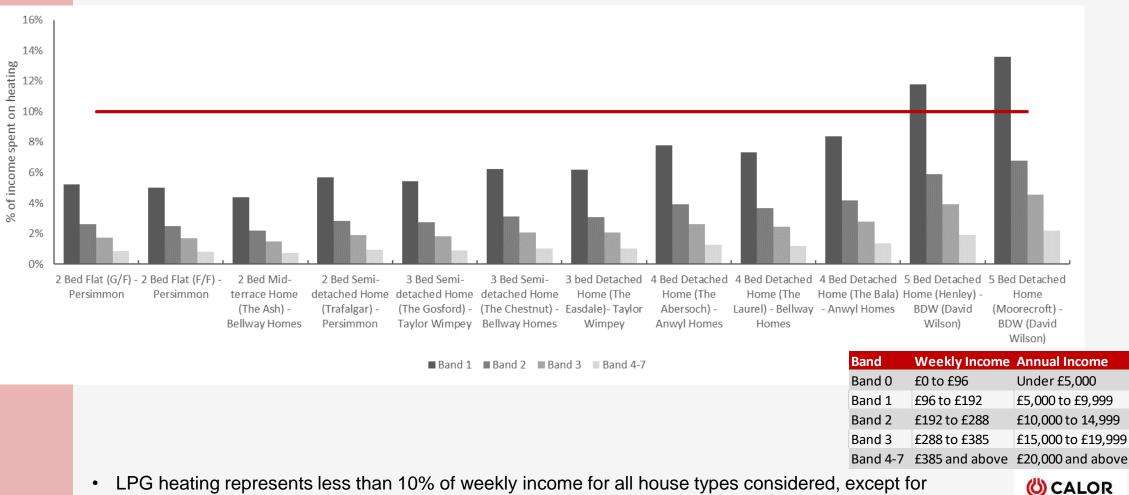
Social Housing Tenant Income



- Two-thirds (67%) of social household tenants have a gross annual income below £20,000
- This equates to having a weekly of below £385
- 4% of households in social housing have an annual income of less than £5000 (<£96 per week)

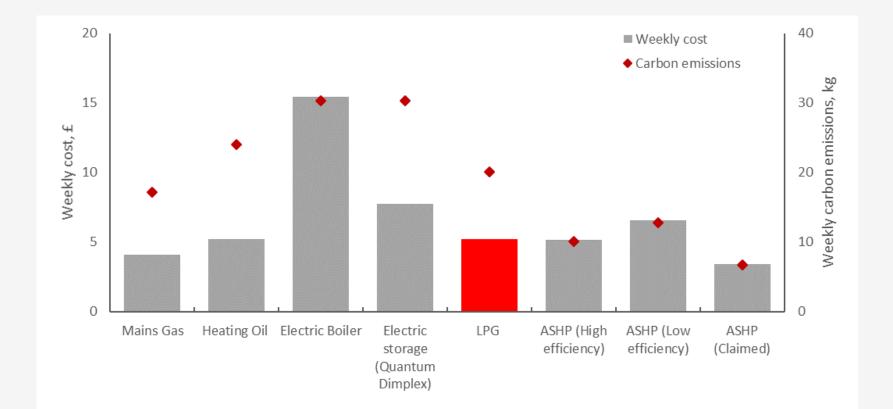
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LPG Heating Costs - % of Social Housing Tenant Income



households with living in a 5-bed detached home with an annual income less than £9,999.

Carbon emissions produced by each heating technology



- The weekly heating costs and amount of CO2 produced are shown for a new build Taylor Wimpey 3-bed semi-detached house (The Gosford)
- The bars show the weekly costs (left axis) while the markers above the bars show the amount of carbon produced (right axis)

Assumptions

Total heating demand

- Actual SAP reports are used which give the hot water and space heating demand for various new build properties built by different property developers.
- The total floor area is also used which is the sum of the ground floor area + first floor area.

ASHP efficiencies

- Three values for the efficiency of an ASHP are quoted low, high and claimed.
- The high efficiency is taken from BEIS's monthly RHI deployment statistics. The low efficiency value is taken from the report on RHPP by UCL and DECC.
- Efficiency value is taken from a Samsung brochure on ASHPs

Tariff calculation for Electric storage heater (Quantum Dimplex)

- We assume households using a Quantum Dimplex storage heater consume 90% of their energy use during off-peak hours. The remaining 10% is done in peak hours.
- BEIS reports that Economy 7 variable tariffs in the UK were 17.4p/kWh in the day and 7.9p/kWh in the night. Fixed costs for standing charges were £78.43/year. These figures were based on a consumption of 6,000kWh/year. The fixed cost (£78.43/year) was divided by total consumption (6,000kWh) to give fixed costs per kWh. This was then added to the variable costs to give a total tariff (variable + fixed)
- A total tariff was calculated to include fixed costs. Updated tariffs 18.7p/kWh in the day (peak time) and 7.9/kWh in the night (off-peak)
- Since 90% of energy consumption is done in off-peak hours, the tariffs are adjusted to reflect this 90%*7.9p and 10%*18.7p. This gives a weighted tariff of 8.96p/kWh.



References & Links

| Item | Source | Document name | Link/URL | Reference |
|---|--------------|---|---|---|
| Total heating demand | Calor/SAP | SAP worksheet: New dwelling design stage | - | Page 9 and 10 - sum of space heating demand (211) and water heating (219) |
| Total floor area | Calor/SAP | SAP worksheet: New dwelling design stage | - | Page 1 – total floor area (ground floor + first floor area) |
| Fuel prices (electricity and mains gas) | BEIS | Data tables 1-19 supporting the toolkit and the guidance 2017 | https://www.gov.uk/government/ publications/valuation-of-energy- use-and-greenhouse-gas- emissions-for-appraisal | Tables 4-8 (Domestic Central Prices in 2018) |
| LPG price | Calor | - | - | - |
| Heating oil price | Boiler juice | UK average home heating oil prices | https://www.boilerjuice.com/heating-oil-prices/ | Average of daily prices (April 2018 – October 2018) |
| System efficiencies | Ofgem | ECO3 Deemed Scores Methodology | https://www.ofgem.gov.uk/syste m/files/docs/2018/07/eco3_dee med_scores_methodology_docu ment_200718.pdf | Page 19 – Replacement heating assumptions (after) |

References & Links

| ltem | Source | Document name | Link/URL | Reference |
|--------------------------------------|----------|--|---|---|
| ASHP efficiency (High efficiency) | BEIS | RHI deployment data | https://www.gov.uk/government/collections/renewable-heat-incentive-statistics | Tab 2.12 |
| ASHP efficiency (Low efficiency) | BEIS/UCL | Analysis of data from heat pumps installed via the renewable heat incentive premium payment (RHPP) scheme to the Department of Energy and Climate Change (DECC) | https://assets.publishing.service.gov.uk /government/uploads/system/uploads/a ttachment_data/file/606778/DECC_RH PP_160112_Detailed_analysis_report_ v5.3.pdf | Page 10 |
| ASHP efficiency (claimed) | Samsung | EHS Technical Data Book: EHS Mono for Europe | https://www.samsung.com/common/file s/techinfo/AE160JXYDGH/EU/EHS%2 0IDU%20and%200DU%20Mono%20f or%20Europe_50Hz_Ver1_4_TDB.pdf | Page 6 (SCOP at 35 degrees) |
| Carbon intensities | BEIS | Greenhouse gas reportings: conversion factors 2017 | https://www.gov.uk/government/publica tions/greenhouse-gas-reporting- conversion-factors-2017 | UK electricity tab and fuels tab. Intensities measured in kgCO2/ kWh (gross) |
| Social housing income | | FA3551 (S521): gross annual income of household reference person and partner by type of letting | https://www.gov.uk/government/statisti cal-data-sets/social-and-private-renters | Tab 2016-17 |



References & Links

| Item | Source | Document name | Link/URL | Reference |
|--|--------|--|--|--|
| Energy consumption (heat & hot water) | BEIS | Energy Consumption in the UK (2018 update) | https://www.gov.uk/government/collecti ons/energy-consumption-in-the-uk | Tab 1.04 |
| Economy 7 tariffs | BEIS | Average variable unit costs and fixed costs for electricity for UK regions | https://assets.publishing.service.gov.uk /government/uploads/system/uploads/a ttachment_data/file/743761/table_224. xls | Tab '2017 Economy 7 Electricity' United Kingdom values (N21, O21 and P21) |