

Additional Evidence to the Local Government and Communities Committee

Energy Performance of New Homes

Further to the evidence previously provided to the committee, Homes for Scotland (HFS) welcomes the opportunity to provide supplementary evidence regarding the energy performance of new homes.

Following the evidence session on Wednesday 7 February, HFS has expanded upon its data sample to provide greater insight into the potential energy savings achieved from new build homes across the 2010 and 2015 building standards range.

It should be noted that data used for this analysis has been extracted from EPC data obtained from our member companies. While this does not represent every new build home in Scotland, it provides a broad indication of the performance levels achieved by the new build sector. EPC data for new build homes is generated through use of BRE approved Standard Assessment Procedure (SAP) software used by the industry to meet Section 6: Energy of the Scottish Building Standards (for reference RdSAP is used to produce EPCs for existing dwellings). It is understood that EPC data does have its limitations, given it relies on detailed design stage inputs as well as manufacturers' performance specifications to provide indicators of the fabric energy efficiency, energy consumption, environmental impact, and dwelling CO₂ emissions rates. SAP and EPC data can not make assumptions regarding human behaviours and cultures that can impact the energy performance and consumption in a new build home.

That being said, EPC data currently provides the only reliable source to measure and compare the performance of buildings. EPC data is not currently openly available at scale and can only be accessed on an individual certificate basis at the moment.

General Statistics

	FLOOR AREA	EER	EFR	ESTIMATE ENERGY COSTS (3Y)	ESTIMATED ENERGY COSTS (ANNUAL)	ESTIMATED ENERGY COSTS (MONTH)	ANNUAL ESTIMATED ENERGY COSTS PER SQM	MONTHLY ESTIMATED ENERGY COSTS PER SQM
AVERAGE	122	85	87	£1,423	£474	£39.53	£4.07	£0.34
MIN	66	80	79	£720	£240	£20.00	£1.90	£0.16
MAX	210	91	96	£2,664	£888	£74.00	£5.36	£0.45
MEDIAN	101	85	87	£1,322	£441	£36.71	£4.17	£0.35

Table 1. EPC Data Sample (Combined Years)

HFS has obtained a sample of 26 EPCs relating to a range of two, three, and four bedroom homes from a range of housing typologies including bungalows, flats and detached dwellings. 20 of these relate to entries received to the Home of the Year category for the Homes for Scotland Awards between 2014 and 2017. 18 EPCs are in relation to homes built to 2010 building standards. Further examples, for predominantly 2015 house types, have been provided by member companies to provide further insight into the energy efficiency of new homes. The sample data includes house types that have utilised a range of Low and Zero Carbon Energy Generating Technologies including combined heat and power, photovoltaics and air source heat pumps. The table above shows the average figures pertaining to the overall data sample. The EPC data has been broken down to show estimated energy costs per square metre so that further comparisons can be made.

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REF	HFS AWARDS YEAR	ASSESSMENT YEAR	FLOOR AREA (SQM)	EER	EFR	ESTIMATED ENERGY COSTS (3Y)	ESTIMATED ENERGY COSTS (ANNUAL)	ESTIMATED ENERGY COSTS (MONTH)	ANNUAL ENERGY COSTS (SQM)	MONTHLY ENERGY COSTS (SQM)	LZCEGT
2315	2015	2014	210	87	87	£1,878	£626	£52	£2.98	£0.25	
1474	2014	2013	210	80	79	£2,664	£888	£74	£4.23	£0.35	
9996	2017	2016	95	84	87	£1,263	£421	£35	£4.43	£0.37	
1933	N/A	2017	95	88	89	£1,347	£449	£37	£4.73	£0.39	Solar Photovoltaics
7926	N/A	2017	81	87	90	£1,113	£371	£31	£4.58	£0.38	Solar Photovoltaics
7924	2017	2014	80	84	87	£1,134	£378	£32	£4.73	£0.39	

Table 2. Example Sample Data of Similarly Sized Dwellings

Table 2 shows no real correlation between the floor size of a new dwelling and the estimated energy costs as predicted by the EPC. Energy efficiency ratings (EER) do provide a solid indicator of the energy performance of a new home, however it does become more difficult to compare when low and zero carbon energy generating technologies (LZCEGT) have been utilised as a solution to meeting Section 6 of the Building Standards. It does go to emphasise the importance that fabric efficiency has on the overall energy performance of a new dwelling.

More generally, Table 3 (below) indicates that there has been an improvement more generally to energy consumption arising from the latest step change in building standards. The data suggest that there has been on average a 9% saving on energy costs between dwellings constructed to 2010 and 2015 standards, with estimated monthly costs ranging from £0.16/sqm to £0.39/sqm.

	FLOOR AREA	EER	EFR	ESTIMATE ENERGY COSTS (3Y)	ESTIMATED ENERGY COSTS (ANNUAL)	ESTIMATED ENERGY COSTS (MONTH)	ANNUAL ESTIMATED ENERGY COSTS PER SQM	MONTHLY ESTIMATED ENERGY COSTS PER SQM
EPC DATA FOR 2010 BUILDING STANDARDS								
AVERAGE	122	84	87	£1,462	£487	£40.62	£4.19	£0.35
MIN	66	80	79	£1,011	£337	£28.08	£2.98	£0.25
MAX	210	90	96	£2,664	£888	£74.00	£5.36	£0.45
MEDIAN	101	84	87	£1,323	£441	£36.75	£4.27	£0.36
EPC DATA FOR 2015 BUILDING STANDARDS								
AVERAGE	121	87	88	£1,335	£445	£37.07	£3.80	£0.32
MIN	75	84	83	£720	£240	£20.00	£1.90	£0.16
MAX	177	91	91	£1,968	£656	£54.67	£4.73	£0.39
MEDIAN	109	88	90	£1,305	£435	£36.25	£4.04	£0.34
DIFFERENCE								
UNIT	1	2.8	1.4	128	£42.51	£3.54	£0.39	£0.03
%	0.42%	3.32%	1.57%	8.72%	8.72%	8.72%	9.29%	9.29%

Table 3. Analysis of 2010 and 2015 EPC Data

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	ELECTRICITY	GAS
STANDARD CREDIT	£631	£697
DIRECT DEBIT	£563	£615
PREPAYMENT	£627	£704
AVERAGE	£607	£672
AVERAGE ANNUAL ENERGY BILL	£1279	
AVERAGE MONTHLY ENERGY BILL	£106.58	

Table 4. Scottish Data extracted from Department for Business, Energy & Industrial Strategy: Quarterly Energy Prices Tables Annex, December 2016

It is difficult to provide accurate comparisons of estimated energy costs between new build and existing dwellings given the lack of data, unfortunately this also means we cannot produce a breakdown of the figures into a square metre rate to aid comparison. Instead it is useful to look to the UK Government's Quarterly Energy Price Statistics which can provide a good baseline as to the average energy costs for the existing housing stock. Table 4 provides a breakdown of the average energy costs for Scotland. The figures above suggest that a saving of around £66 between homes built to 2010 standards and the average monthly energy bill. This increases to around £69 for dwellings constructed to 2015 standards.

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Distribution Network Operators

Further to the evidence previously provided to the committee, HFS welcomes the opportunity to provide supplementary evidence regarding the difficulties experienced by the sector when engaging with Distribution Network Operators (DNOs).

We noted at the session held 7 February that developers and individuals were finding it more difficult to connect low and zero carbon energy generating technologies (LZCEGT) to the grid, and that the development community were finding it difficult engaging with DNOs on such matters. Following this session we have sought further evidence from members to provide additional insight into these issues.

Geography & Regional Experiences

It is worth highlighting that whilst HFS has sought data from members to better understand their experiences on a regional basis, there are only two DNOs in Scotland; Scottish Power Energy Networks (SPEN) operating in the south of Scotland, and Scottish & Southern Energy Networks (SSEN) operating to the north. For ease of reference, data has been collected from members on a local authority area basis; however it is important to note that members' experiences are not a reflection of any issues experienced with local authority representatives.

In our more recent survey members indicated that they have experienced difficulties engaging with DNOs in the following areas: City of Edinburgh, East Ayrshire, East Lothian, Fife, Glasgow City, Midlothian, Perth & Kinross, Renfrewshire, South Ayrshire and South Lanarkshire.

With regard to the connection of LZCEGT, generally our members noted capacity issues across the central belt of Scotland, however specifically noted issues in the following areas: City of Edinburgh, East Ayrshire, Fife, Glasgow City, Perth & Kinross, Renfrewshire, South Ayrshire and South Lanarkshire.

As well as issues regarding the connection of LZCEGT to the network, members also identified obtaining wayleaves and general communications and engagement with DNOs to be of concern.

Connection of LZCEGT to the Network

Members have made specific reference to network capacity issues across the central belt, highlighting that the network cannot cope with the electricity now being generated from new development.

Whilst building standards has encouraged developers to utilise LZCEGT on new developments, DNOs have been noted to restrict the connection of such technologies back to the grid. One example provided by a member highlights a situation where on two sites (of 700 and 650 units) the DNO has restricted the connection of photovoltaic panels (PV) to only 25 units per site, until phased network reinforcement has been carried out. The phasing, costs and delays caused through the obtaining of wayleaves for network upgrades located several kilometres from the sites can cause significant disruption to the developer in their ability to deliver new housing supply. Another example noted that the DNO advised that the developer could not connect to the network at all, even when utilising a flow limiter so no electricity is fed back to the network.

It is further understood that restrictions to network access may also impact the granting of building warrant completion certificates as current guidance expects that electricity generated from PV is connected to back up to the grid. This issue has been raised with Building Standards Division where we are awaiting further guidance and clarity on the matter.

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Another related concern includes DNOs requiring a 50 day lead in times to provide such connections and finally the need for clear guidance and design parameters so that LZCEGT can be incorporated seamlessly into new developments.

Wayleaves

Wayleaves remain an ongoing issue for the industry with members noting that DNOs provide no timescales for their conclusion. One example notes that this can take approximately 16 weeks, with an additional 4 week period to connect a sub-station from conclusion of missives. This type of delay can have a significant impact on development timescales and delivery.

General Communications and Engagement

Members highlighted the difficulty in establishing a single point of contact for developer services within DNO organisations. In relation to Wayleaves, it is typically noted that DNOs and their legal teams will only deal with communications from developers' solicitors. Where multiple developers are working together, it is understood that it can take months before anything gets moving.

Conclusion

It is clear from the conversations we hold with our members that there is, at times, a disconnect between the way in which policy and regulations relate to the opportunities on the ground to deliver the proposed benefits. In this case it is apparent that policies implemented at a national and regional level, promoting use of LZCEGT, have not fully taken into account the deliverability of such benefits given the capacity constraints that exist on the power network. To be able to capitalise on future opportunities it is vital that industry stakeholders are involved earlier in the development of policy, ensuring that appropriate solutions can be found prior to implementation.