# **SEEDS International Conference**

# Homes fit for future generations

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## Abstract

The Wellbeing of Future Generations Act (WFGA, 2016) was developed in parallel with the United Nations' Sustainable Development Goals (SDGs). This unique piece of legislation requires that all Welsh public bodies think longer term in their decision-making, by working together with people and their communities "to create a Wales that we all want to live in, now and in the future." (WFGA\_The Essentials, 2015)

The Homes for Future Generations (HFFG) project (2020-2021) investigated how the seven goals enshrined in WFGA can be applied to deliver sustainable housing in Wales, "without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). To achieve this aim, six architectural practices each designed a housing case study that complies with WFGA. The case studies were connected by a shared set of emerging *guiding principles* (one for each WFGA goal) and a single masterplan. These principles were tested and refined through the design process.

This paper articulates key lessons learnt through the HFFG project. The seven guiding principles are explained, with reference to seven themed essays that were developed in response to the design work. The paper describes potential benefits of compliance with WFGA (and, by implication, the UN SDGs). The paper also identifies and challenges key barriers that currently limit application of the WFGA goals to new housing. Conclusions drawn have relevance to planners and policy makers, designers and constructors, and to future owners and occupiers.

#### Key words

Housing standards quality sustainability holistic decarbonisation

#### Introduction

Sixty years ago, in the context of a fundamental need to improve the quality of new housing, the Parker Morris Committee published Homes for Today and Tomorrow (MHLG, 1961). Its recommendations, particularly around increasing space standards to meet changed expectations, became a mandatory standard for all new towns and social housing which only ended in 1980, when a Conservative government sought to reduce the cost of housing and, generally, public spending. Today, again, there is a clear need for better housing, but a lack of understanding of how such improvement can be made.

The Well-being of Future Generations (Wales) Act came into force in April 2016. It requires that public bodies think longer term in their decision-making, by working together with people and their communities to create a Wales that we all want to live in, now and in the future. In the same year, the Environment (Wales) Act 2016 put into place legislation requiring that the nation's natural resources be managed in a more sustainable, pro-active, and joined-up way. More recently, widespread recognition of the climate emergency escalated the perceived urgency of decarbonisation and in 2019, the UK Committee for Climate Change stated that Welsh Government should target no less than a 95% reduction in carbon emissions by 2050 (CCC, 2019). The housing stock currently produces 21% of Welsh carbon emissions (BEIS 2018).

Each year in Wales, less than half the new homes needed are constructed. Low rates of replacement mean that more than 90% of the homes that exist today are likely to remain in use by 2050 (PPIW, 2015), significantly increasing the challenge of complying with international decarbonisation targets. There is a clear need throughout Wales for more housing, and for homes that perform better (Green et al, 2016). Planning Policy Wales Edition 10 (December 2018) cites the importance of adhering to WFGA principles, if we are to develop a "vision of the Wales we want" (p.2). However, there are remarkably few examples in Wales (or elsewhere in the UK) of 'good' housing that meet the holistic goals established by the WFGA.

"The UK is heavily dependent on a handful of volume housebuilders motivated by short-term profitability. This model has served us badly. It has, of course, failed to create more than about half the new homes that the country needs. But more fundamentally, it has failed us in the quality of design and placemaking. As well as poor workmanship, abysmal space standards and an absence of investment in innovation and building skills, the major housebuilders have let us down by reneging on promises to include affordable homes."

Richard Best, foreword to The Housing Design Handbook (Levitt et. al., 2019)

Successive economic recessions and a determined focus on technical compliance and cost over quality have taken their toll on the quality of new housing. At this time, capital cost remains critical in determining whether a project is delivered or not, and severely constrains the potential for quality in a holistic sense.

However, both WFGA and the Environment Act (2016) require that the benefits of better quality homes and places be prioritised over short-term expedience. For legislation to be satisfied, we must produce housing that focuses not on capital cost but on the wider, future benefits for occupants, their neighbours, the surrounding community, and the nation as a whole. Longer term, there will be strict penalties for Wales if international decarbonisation targets are not met. The future implications of climate change are still being deciphered, but any discussion of future housing models must respond fully to the climate emergency, both in terms of the technical performance of the homes that are built and in terms of the behaviour of the occupants.

To effect change in this context, it was deemed important to demonstrate how the seven goals of WFGA can be synthesised through good design, to deliver high quality homes and neighbourhoods that meet the aspirations of the WFGA holistically – now and in the future. That challenge was the focus of this research.

#### **Research aims**

The HFFG project aimed to demonstrate how the seven goals enshrined in WFGA can be applied through good design to new housing in Wales, and explore the benefits that should result.

Figure 1 (right): seven goals enshrined in the Wellbeing of Future Generations Act with the combined agenda of "acting today for a better tomorrow." Image source: https://www.futuregenerations.wales/



Six design teams were each asked to develop a housing proposal that meets the needs of a particular type of end user. The proposals share a common site in North Wales. The site and surrounding context have attributes that are common to many other locations in Wales, to ensure that lessons learnt are applicable elsewhere. The design teams collaborated on production of a masterplan for the whole site, before developing housing proposals that respond to their allocated end user.

The six resulting case studies describe a range of different homes and neighbourhoods that meet the ambitions of both the WFGA and the Environment (Wales) Act, comply with international targets for decarbonisation, and provide high quality places for people to live together. Because they share a common site, the case studies also explore how new forms of housing can be integrated with each other and their wider context, preventing some of the issues that tend to ostracise typical housing developments.

The proposals were collectively reviewed at key stages. During this process, the project team identified significant issues embedded in the way that housing is typically planned, commissioned, procured and delivered that make the challenge of designing homes to meet WFGA goals almost insurmountable. These issues are reflected in this paper's conclusions.



Figure 2 (above): a single masterplan for the six connected housing proposals supported the development of a shared landscape, and key agendas such as legibility, connectedness, ecological value and diverse amenity.

## **Research method**

The research was funded by Welsh Government through their *Innovative Housing Programme* (IHP). Prior to commissioning of the research, discussion facilitated by the Design Commission for Wales (the body that administers the RIBA design review process throughout Wales) had identified that projects supported by the IHP tended to prioritise focussed (often technical) innovation over holistic quality. Funding for this project was approved in February 2020, with the explicit aim of understanding the barriers to more holistic quality in new housing, and the benefits that could result.

The research proposal stated that the project should be sited outside of south-east Wales, to ensure that lessons learnt are valid throughout the less urban parts of Wales. (Around 1 in 3 people in Wales live in an area classed as rural, compared with 1 in 5 people in England. Wales Centre for Health, 2007, p.3) Following an approach by local councillor Craig ab Iago, Gwynedd in North Wales was identified as the preferred location for the project. Discussion with both the Local Authority and a local housing association (Grwp Cynefin) established six distinct types of housing need in the area, along with a set of stakeholders who would act as client for the project. The intention was that design work would generate case studies relevant to general needs housing (three distinct 'end users', see table 1 overleaf) and to more specialist housing need (three more end users).

Five UK-based architectural practices were then asked to participate in the project, on the basis of recognised expertise in housing design. In addition to the lead researcher, they formulated six design teams. Each design team was asked to develop housing for a particular user group, according to their expertise. The six user groups are listed below (table 1), alongside details of the practice responsible for the design work, the theoretical client, focus of innovation and proposed dwelling mix.

For the purposes of this research, the seven WFGA goals were then translated into seven 'guiding principles' with more direct relevance to housing. These principles were not produced directly by the Office of the Future Generations Commissioner, but were interpreted from the definitions of each WFGA goal. (For formal definitions, see <u>https://www.futuregenerations.wales/about-us/future-generations-act/</u>). The principles provided the collaborating design teams with clear, consistent objectives and a place to start their investigations.

End user	client	designer	focus of innovation	dwelling mix
Social housing for	Housing	Feilden Clegg	Homes with capacity for change,	12 flats and
families and	Association	Bradley Studios	set in a biodiverse living	12 houses
individuals			landscape.	
Collaborative	Homelessness	Design Research	A combined model for urgent	6 short stay
living for	charity	Unit Wales	need housing, supported housing	6 intermediate
homeless people			and dispersed housing.	13 1 bed flats
Affordable homes	Private sector	Emmett Russell	Flexible, adaptable housing that	29 live/work units:
with live-work		Architects	accommodates change in	17 houses + 12 flats
options			working practices.	
Accessible homes	Housing	Pentan	Fully accessible courtyard houses	8x 1 bedroom
for older people	association /	Architects	for downsizers with 'space to	dwellings
	private sector		grow'.	
Custom-built	Private sector /	Rural Office for	A custom-build framework that	10 flexible houses, 2
starter homes	coop.	Architecture	creates opportunities for self-	apartments
			build, growth + change.	
Housing for	Local authority	Welsh School of	Equitable, accessible homes for	10x1 bedroom
people with acute		Architecture	all, regardless of differing needs.	houses,
needs				4x2 bedroom houses

Table 1: Designing for six different end users

Gwynedd Local Authority also provided a single site for the six housing proposals on the easterly edge of Caernarfon (figure 3, right) – an historic town of around 10,000 inhabitants, with characteristics that are common to many other medium-sized Welsh towns. The edge of settlement site in a 'typical' suburban context was also chosen to make learning as transferrable as possible. Allocation of a site, identification of six end users and development of the WFGA guiding principles together enabled co-production of a working brief for the project.



After generating initial ideas, each design team contributed to co-production of an overarching masterplan for the site (May 2020, figure 2). This masterplan was essential to develop understanding of infrastructure, movement through the site, housing density and amenity requirements. The strategy explored adjacencies and developed approximate locations for the six types of housing, as well as establishing key strategic moves that cut across the different housing proposals. These moves included establishing essential infrastructure and movement across the site, agreeing a parking standard, and identifying the importance of green corridors that connect town (to the west of the site) with countryside (to the east).

Design work was progressed on the basis of this strategy and the seven emerging design principles to RIBA stage 2. This enabled the six design teams to develop housing proposals

that could be tested in terms of form, organisation, layout, scale and amount in a coordinated way. The next key milestone came in June 2020. The masterplan and associated proposals were critically reviewed by a panel of experts organised by the Design Commission for Wales, to ensure a constructive discussion took place before detailed design proposals were developed. (Panel members were drawn from DCfW's roster of design review practitioners, based on the relevance of their expertise.) Observations made by the panel challenged the work completed to date, and informed the future direction the project would take. In a further development of the masterplan, each general needs housing type was coupled with a specialist housing type, to facilitate more explicit integration of different end users. This also allowed the project to explore the opportunities and challenges that arose from each coupling of end users, alongside the more 'typical' challenge of embedding a new housing scheme into an established neighbourhood context.

With the overarching site strategy agreed, each design team worked closely with their partner design team, and more loosely with the wider project team, by regularly sharing work as it developed. This collaborative approach resulted in the production of three 'neighbourhood' characters, and six integrated housing case studies to RIBA Stage 3. Proposals were costed by a cost consultant as part of the project. These more developed proposals were taken back to the same Design Commission review panel in December 2020. At each review, the seven guiding principles were iteratively tested and refined. The resulting conversation established key themes and concerns that would shape the observations made within this paper. At this point in the project it was agreed that reporting should not focus on the case studies themselves, but on the discussion that arose, and the transferrable learning that was derived from the design work.

After a short hiatus (related to Covid19), seven short essays were written (see discussion, overleaf) as a vehicle for developing and testing transferrable learning from the project. Each of the seven essays attempts to document the opportunities, challenges and barriers encountered by the design teams when designing housing that meets the aims of one WFGA goal. The essays were all written by the principal investigator to maintain a consistent tone, but draw on notes taken during the collaborative review sessions that involved the design teams and the review panel. The seven resulting essays form the basis of the final report (published April 2021). Key observations were recorded, along with the final version of the seven guiding principles. High level lessons were drawn from the essays, in the form of recommendation for planning and policy, design and construction and the end user. These recommendations form the latter half of this paper.

## The discussion – seven essays

Seven essays were produced from the design work as a means of identifying key issues that arose during the design process, and discussing how they might be overcome in the future.

Essay 1: *Planning for sustainable homes* discusses the WFGA goal "a resilient Wales". The discussion focuses on the tension between cars, amenity and ecology, and the importance of sustainable planning of new housing developments.

Essay 2: *Speaking the local language* discusses the WFGA goal "a Wales of thriving culture and language" by exploring the importance of responding to (and connecting to) context in future housing developments.

Essay 3. *Equity before equality* discusses the WFGA goal "a more equal Wales" by analysing the difference between equity and equality in housing schemes. This leads to observations regarding the importance of considering the end user in housing design.

Essay 4. *Sharing space - is hell other people?* discusses the WFGA goal "a Wales of cohesive communities" and the ways in which private housebuilding practice currently limits the quality of the resulting neighbourhoods.

Essay 5. *Signs of growth – building for recovery* discusses the WFGA goal "a prosperous Wales" by analysing opportunities to use housing development to strengthen local economies through the use of local resources, skills and supply chains.

Essay 6. *The benefits of building better* discusses the WFGA goal "a healthier Wales" and the potential of better quality housing to relieve pressure on the national health service, with consequent savings to the public purse.

Essay 7. *The challenge of behaving better* discusses the WFGA goal "a globally responsible Wales" and the extent to which changing established patterns of behaviour is an integral part of meeting WFGA aspirations in the future.

Within each essay, observations were drawn regarding the changes that must be made to current practice, if future housing developments are to meet the aspirations of WFGA and the UN Sustainable Development Goals. See next section: *Applying the learning*.

## Applying the learning

Anyone involved in the procurement, design and construction of public housing in Wales now has a responsibility to think longer term and adopt principles other than 'reduce capital cost' – from policy makers and landlords to site operatives and maintenance teams. The design work produced for this project describes a rich array of benefits that can be derived from better housing, if appropriate guiding principles are adopted. However, the research also revealed constraints that prevent new housing from being designed and built with a longer term perspective, or diminish the benefits that result.

The potential of future housing developments to meet WFGA aspirations is often compromised by decisions made before designers and constructors get involved. Collective responsibility for better housing must be extended to a wider group of stakeholders. This includes people who make decisions about the location and type of future housing developments, people who design, maintain, adapt and demolish our homes, and of course the people who inhabit them. Key observations are therefore summarised for three different types of stakeholder below.

## 1. Policy-makers and planners

Strategic decision-making must be improved, if housing is to meet WFGA goals and UN SDGs. The importance of location cannot be overstated. Currently, a focus on developer profit tends to result in the development of large parcels of land in more affluent, easy-to-reach areas. Much of Wales consists of small towns in dire need of more, better homes to sustain existing communities and allow for some growth. However, established settlement boundaries, fragmented sites and depressed property values limit opportunities to deliver homes where they are really needed – locations that are potentially more sustainable.

Sustainable communities require well connected streets, good public transport, plentiful local amenities, abundant low carbon energy and sustainable drainage. Tight, constrained brownfield sites are more likely to meet these criteria than the large, open edge-of-settlement sites preferred by volume housebuilders. Where possible, housing should be used to bring life – and investment – back into our towns and villages, rather than pushing people out to their periphery.

The Wales Parking Standard (CSS Wales, 2014) typically requires one parking space per bedroom. This severely compromises the potential of housing schemes to include meaningful amenity and ecology, while meeting established targets for density. However, most of the land currently earmarked for housing is not viable unless parking is provided on site, if homes are to meet the needs of a 'typical' household. Better criteria must be used to allocate sites for housing. Housing models must be developed that suit different locations, and that balance land use, density, amenity, ecology and the car. The improvement and expansion of public transport networks must be prioritised.



Figure 4: land use as proposed (left) and after adopting the Wales Parking Standard (right)

The private sector is unlikely to instigate change of this magnitude unaided. Many of the benefits of better homes outlined in this report would add considerably to the value of new homes, but housing developers must be given tools to compare these benefits if they are to make informed decisions, for example by prioritising one benefit over another. Clear metrics should be established for measuring and comparing different benefits of better homes. These metrics should be used to account for better decision-making.

It is important to recognise that there is no single silver bullet, and housing models that fully realise WFGA ambitions are unlikely to appear overnight (see figure 5 overleaf). Housing providers must adopt an aspirational approach, continually pushing best practice, until truly sustainable development becomes the new 'norm'. There are few housing or construction standards that truly encourage holistic quality, but one such standard is the Living Building Challenge (LBC). While there is currently only one certified LBC project in the UK, the international building standard has been adopted more widely elsewhere (notably in North America). It assesses how projects can have the greatest positive impact, and requires an holistic approach and a change in mindset from 'doing less bad' to 'doing more good'. "Even the most rigorous and eco-efficient business paradigm does not challenge basic methods and practices...our concept of eco-effectiveness means working on the right things...instead of making the wrong things less bad." Cradle to Cradle, William McDonough & Michael Braungart (2009)



Dovolonmont	location	site and density	Character	health wellbeing	opportunity
Development	Detterrechte	Site and density	Character	De ancia avalita	
Intensitying	Better public	Brownfield sites.	Characterful	Poor air quality.	Investing in town
urban centres	transport and	Higher density	development can	Typically hard	and city centres
	local amenities	puts pressure on	improve the wider	contexts with	to benefit the
	mean that low /	internal and	identity of a place.	limited local	wider community.
	zero parking is	external space		ecology /	
	needed.	standards.		biodiversity.	
Reinforcing	By improving	Older urban	Existing	Higher density	Complimenting
historic	public transport	grain often	neighbourhoods	neighbourhoods	existing housing
patterns	and local	achieves high	often have an	often prioritise	types and
	amenities, car	densities but	established	privacy over	development
	use can	limits	character / sense	community.	patterns.
	reasonably be	opportunities to	of place.		-
	reduced.	improve.			
New suburban	Limited public	Low density	Repetitive house	Low density	Densifying areas
growth	transport and	estates typically	types & materials	improves air	often
-	local amenities.	dominated by	result in a lack of	quality and	characterised by
	Estate roads	car use. Infill can	character. Focus	provides space.	inefficient land
	limit growth	increase density	on privacy	'Left over' spaces	use and limited
	unless low car	and variety.	diminishes	tend to be low	character
	use is justified.		connectedness.	value and sterile.	
Repopulating	Communities	Development	Smaller, older	Smaller	Bringing life back
depleted	have often lost	opportunities	places often have	communities have	to depleted
communities	nublic transport	exist at or near	a distinct	higher	communities with
communics	connections and	the centre of	underlying	environmental	low market value
	local amonities	smaller older	character but may	quality and good	low market value.
	iocal amenities.	communities	bo in pood of TLC		
		communities.	be in need of TLC.	accessio	
Dovelonment	Dublic transport	Land may be	Character may be	Bottor	Different models
ot the odge		aroonfield and	character may be	Dellel	for housing and
at the edge	to be rear and	greenneid and	Suburban or rural.	environmental	for nousing and
	to be poor, and	or wider benefit.	Different nouse	quality generally,	living, with
	travel necessary	Options for	types may be	and good access	different benefits.
	tor local	autonomous	needed.	to outdoors.	
	amenities.	(self-sufficient)			
		housing.	1	1	

## 2. Designers and constructors

There are barriers to better housing that design alone cannot overcome (see previous page). However, design has a clear remit - to ensure that housing is contextually appropriate and meets the needs of the user. Standardised house types tend to be reductive in terms of character, contextual relevance and suitability for end users. Homes must be designed with the user at the centre of the process. Neighbourhoods must be designed with a language that considers context and speaks of place.

The climate crisis demands that we build better homes – not just for ourselves and our future generations, but for a better future globally. International decarbonisation targets demand higher levels of energy efficiency than UK Building Regulations, and most new homes underperform 'as built' due to the performance gap. All new housing must be built to a standard that meets international targets. This requires that we build carbon negative homes today. They do not need to cost significantly more than established housing models, and the potential benefits are extensive. Some benefits offer quantifiable longer term cost savings. Other benefits are more difficult to measure, but no less important. Some decisions that move us away from an exclusive focus on capital cost should be easy to make, because the wider impacts are well known (e.g. reducing the amount of cement and PVC used in construction). However, in the first instance, such changes require strong leadership and top-down regulation if they are to be widespread and lasting.

Other changes are less straightforward to make, typically because societal or environmental benefits must be balanced against disbenefits to the end user (e.g. transition to a low carbon heating system that increases fuel bills). For these changes to take place, further research, guidance and support are needed, to establish when such changes should take place, and how. Standards must be enforceable. It is important to distinguish between watering down targets and providing sufficient flexibility for the right change to take place at the right time, in the right way. Interim standards such as those outlined by UK Government's response to the Future Homes Standard consultation (MHCLG 2021) prolong persistent poor practice, delay a shift towards building better (including change that is needed in the construction industry, the wider marketplace and behaviour at home) and increase the scale of the challenge for future generations.

Housing is complex. The interrelated, sometimes conflicting, benefits of better housing make it difficult to provide clear, succinct design guidance. Case studies are one of the best ways to demonstrate how to improve quality. They can be used to drive higher standards by raising expectations, while maintaining sensitivity to context and meeting a particular housing need. Case studies also help the wider public understand what better actually means, in terms of the built environment and the resulting lived experience. Modern methods of construction promise many benefits including better performance,

less waste, increased capacity to build homes, and greater comfort for the occupant. However, they do not promise these benefits at lower capital cost (for now, at least). Capital cost should not be used as the primary metric for making decisions about when, where and how to build new homes. Homes that perform better will inevitably cost more to build than homes designed and built with an explicit focus on capital cost. However, better homes offer a wide range of benefits in the short, medium and long term. Many benefits have direct or indirect positive financial implications. Benefits are not always easy to understand (let alone measure) but health benefits in particular provide clear financial justification for an agenda that goes beyond capital cost.

If focus shifts away from capital cost, there can be a different view of what is 'desirable'. Shared space, amenity and connectedness must be seen as beneficial, not as liabilities. Landscape and ecology should be seen as ways to connect people, not separate them. Constructors must target quality from the perspective of the occupant, not expedience. They must be incentivised to build properly, without cutting corners, or not build at all (which requires a change in procurement methods and reasonable target costs). Building homes should not be undertaken lightly, or without appropriate guidance. It must be seen as a long-term commitment to future generations as well as existing communities, because it leaves a legacy for many years to come. Perhaps most importantly, the current poverty of ambition pervading housing delivery and the housing market must be replaced with an ambition to build, and behave, better. People involved in the design and construction of new homes should be given support, through best practice learning and expert advice, and encouraged to achieve the highest standards.

#### 3. Occupants

As users, we must raise our expectations in terms of quality. A prolonged national housing shortage and a consistently poor 'offer' from housing developers have led to the widespread acceptance of poor quality, in terms of housing design and workmanship. Homes and neighbourhoods will only meet WFGA aspirations if they are designed and built to higher quality, which in turn requires higher expectations from the end user. We must also change ingrained patterns of behaviour. We must understand that land has an intrinsic value that should not be squandered. We should anticipate the need to make lifestyle changes alongside changes to our homes that save energy, because energy is valuable, and clean energy even more so. And we should expect less convenience. We should be willing to use public transport, and walk to the shops, otherwise local shops and public transport networks will cease to exist. If housing schemes are to foster a stronger sense of community and include shared spaces with real ecological value, attitudes towards private space must change. While

the right to privacy should be preserved, connectedness should also be sought, for all the benefits it brings. More shared places to meet or play inevitably means less private space in terms of gardens, garages and private driveways. For commercial developers to adapt their practice, there must be evidence that this is what people want.

Education is a vital part of encouraging better behaviour, so that people understand the reasons for making changes. The Carbon Literacy Project (<u>https://carbonliteracy.com/</u>) provides a valuable model for educating communities through peer-to-peer training. The most meaningful impact that education can deliver is a common agenda, which is essential if circular economy principles are to be successfully adopted.

Better decision-making today, in all aspects of housing policy, design, construction and use, will have positive impacts on existing neighbourhoods and deliver clear benefits for local communities, while contributing positively to the wellbeing of future generations. Collectively we must rise to the challenge of behaving better today, if we are to affect positive change for future generations and transform the national agenda from 'doing less bad' to 'doing the most good'.

## In conclusion - seven guiding principles

Housing should be planned with a focus on people over vehicles, guided by appropriate assumptions about car parking and infrastructure. (Adoption of the Wales Parking Standard typically compromises space for amenity and ecology.) Development should be biodiverse. Ecologically valuable, useful, connected amenity spaces should contribute to a nature recovery network. The ownership, use and character of these spaces should be unambiguous. (see the Wildlife Trusts report: *Homes for People and Wildlife*)

Developments should have a clear character and a defined sense of place. (Generic house types tends to diminish these qualities.) The architectural language should be culturally informed and contextually relevant. Neighbourhoods should accommodate societies, events and cultural activities. (see DCfW report: *Homes and Places 2*)

Understanding the user is key to better decision-making; people should be at the centre of housing design. Generic housing that tries to accommodate everyone equally tends not to really suit anyone. Decent space standards, long term quality and engagement with the user should be prioritised over capital cost. (see *The Housing Design Handbook* by Levitt et. al)

Neighbourhoods should develop clear connections to context and to existing communities. Improved permeability, shared amenities and spaces for play and intergenerational activity should increase the sense of ownership, with particular focus on younger generations. (see Play Wales' online publication *Childhood, Play and the Playwork Principles*)

Use of locally available, low carbon and carbon sequestering materials should be maximised. Techniques employing local materials, systems or people should be prioritised. Opportunities for training and reskilling should be exploited. Together, these changes will build valuable, productive, locally based, low carbon circular economies. (see the Zero Carbon Homes report by Wood Knowledge Wales)

Homes must be comfortable to occupy and affordable to heat. They should be built of healthy materials. Views, natural light, spatial arrangements and boundary treatments should connect occupants to the outdoors and each other. Neighbourhoods should support activities that promote physical and mental health and wellbeing. (see BRE report *The Full Cost of Poor Housing*)

All new homes should be carbon negative and energy positive. Homes should minimise energy use through a combination of efficient fabric, heat from low carbon sources and onsite renewables. A common agenda is needed to drive behaviour change and promote better collective decision-making over personal convenience. (See LETI - London Energy Transformation Initiative)

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