



One Planet Living[®] for new communities

Guidance on outcomes and
indicators

September 2019

UNIVERSITY OF WESTMINSTER

Produced by Jan Gerhards over the course of a doctoral research project funded by the University of Westminster and carried out in collaboration with Bioregional.

The Director of Studies: Dr Dan Greenwood (University of Westminster).
Supervisors: Professor Simon Joss (University of Glasgow), Dr Tony Manzi (University of Sheffield), and Dr Matt Wood (Bioregional).

For more information view Jan's [ResearchGate profile](#).

© Jan Gerhards 2019.

Contents

Outcomes and indicators	3
Health and happiness	3
Equity and local economy	4
Culture and community	6
Land and nature	7
Sustainable water	9
Local and sustainable food	10
Travel and transport	11
Materials and products	13
Zero waste	14
Zero carbon energy	15

Introduction

Bioregional has written a set of [Goals and Guidance](#) documents for all projects wishing to use the One Planet Living® framework, including one for new communities. Those documents form the basis of One Planet Living, laying out what a new build community should aim for to be truly sustainable, and the high-level actions and strategies that can be used to achieve this vision.

There are further documents available for new communities which can be used to support the high-level Goals and Guidance. This document draws on the existing literature to propose specific outcomes and indicators for each One Planet Living principle. It acts as a reference document for members of a project team who are developing a One Planet Living vision or action plan for a new build community. It is not meant to be a definitive list but aims to provide inspiration and guidance – what are the types of outcomes a project should aim for and what are the indicators that can be used to track progress and monitor performance. The indicators can be used in conjunction with the additional guidance on resident surveys.

Outcomes and indicators

Health and happiness

Outcomes	Phase	Suggested indicators
<ul style="list-style-type: none"> • Healthy lifestyles • Good indoor environments • High levels of wellbeing • Access to health and social care • Good health and safety in construction • Good air quality • Less noise and light pollution • Low risk from natural hazards 	<i>Operation</i>	<ul style="list-style-type: none"> • Average life satisfaction¹ • % of residents which are physically active¹ • % of people satisfied with specified aspects of home²
<p>Notes:</p> <ol style="list-style-type: none"> 1. See the additional guidance document on resident surveys for further details. 2. See the additional guidance document on resident surveys for further details. Aspects of home include: summer indoor air temperature / winter indoor air temperature / natural daylight / noise levels / ventilation and air quality / layout / overall quality. 		

Equity and local economy

Outcomes to consider	Phase	Suggested indicators
<ul style="list-style-type: none"> • Support for local enterprise • Good local jobs • Improved training and skills • Affordable housing • Accessible buildings and spaces • Better wages • Lower energy bills • Increased local investment • Improved infrastructure • Fair international trade • Reduced poverty 	<i>Design</i>	<ul style="list-style-type: none"> • % of affordable housing provided¹
	<i>Construction</i>	<ul style="list-style-type: none"> • % of products and services in construction, by value, which are provided by companies based within a 50 km radius² • Number of apprenticeships created in construction • Proportion of construction jobs going to people living within a 10 km radius • Direct economic value generated and distributed during construction phase³ • Multiplied local economic impact of direct economic value distributed⁴
	<i>Operation</i>	<ul style="list-style-type: none"> • Proportion of businesses on-site which are locally based • Jobs/housing ratio⁵ • Ratios of median house price and rent to local median income • % of commercial or office space available to not-for-profits, social enterprises and start-ups on a flexible or reduced rent basis • % of displaced residents in affordable housing re-allocated within 1km

Notes:

1. According to local or national definition of affordable housing. Possible categories include: social rented (publicly owned), affordable rented (with rents capped at a proportion of the local market rent) or intermediate housing (houses for sale and rent at rents capped as a proportion of local market rent, e.g. under shared equity).
2. Estimate from accounts on accruals basis.
3. Data from project accounts. One approach is the EVG&D from the Global Reporting Initiative, reported on an accruals basis. Report direct economic value generated (revenues); economic value distributed (operating costs / employee wages and benefits / payments to providers of capital / payments to government / community investments); and economic value retained (calculated as

'Direct economic value generated' less 'Economic value distributed'). Guidance notes available in the 'GRI G4 Implementation Manual', pp. 69-70.

4. One possible approach is to use the LM3 local multiplier tool. For a brief overview see www.proveandimprove.org. For detailed guidance see the NEF's 'The Money Trail'.
5. Ratio of permanent full-time (or equivalent) jobs created as a direct result of project, compared to housing units.

Culture and community

Outcomes to consider	Phase	Suggested indicators
<ul style="list-style-type: none"> • Good public spaces • Vibrant local culture and arts • Sense of community • An active culture of sustainability • Increased volunteering • Child-friendly public space • Residents engaged in management and governance • Good safety and security • Heritage is preserved 	<i>Design</i>	<ul style="list-style-type: none"> • m² of public indoor recreation space per capita¹ • % of dwellings within 5 minute (400m) walk of a public open space²
	<i>Operation</i>	<ul style="list-style-type: none"> • % of people satisfied with aspects of community, by aspect³ • Number of community activities or events in the past twelve months • % of people who borrow things and exchange favours with their neighbours³ • % of inhabitants agreeing that people from different backgrounds get on well in local area³ • Average number of neighbours known by name³
<p>Notes:</p> <ol style="list-style-type: none"> 1. Source: World Council on City Data. Based on ISO 37120:2014 - Sustainable development of communities - Indicators for city services and quality of life. 2. Benchmark: LEED-ND: 90% of planned and existing dwelling units and non-residential use entrances within a 400 meters walk of at least one civic and passive use space. The spaces must be at least 1/6 acre (0.067 hectares). 3. See the additional guidance document on resident surveys for further details. 		

Land and nature

Outcomes to consider	Phase	Suggested indicators
<ul style="list-style-type: none"> • Access to recreational green space • Good climate regulation (cooling, cleaning and sequestration) • Rich biodiversity • Natural habitats created or improved • Good biodiversity connections and corridors • Nature activities and education • Good biodiversity management • Reduced flood risk 	<i>Design</i>	<ul style="list-style-type: none"> • m² of public outdoor recreation space per capita¹ • % of land area that has multi-functional green surfaces (performing at least two functions such as water management, recreation, food growing, urban cooling, or species conservation)² • % of development built on a greenfield site³ • Number of trees per hectare
	<i>Operation</i>	<ul style="list-style-type: none"> • Total and change in vascular plant species in area • Total and change in bird species in area • Total and change in invasive species in area • % of area with tree canopy coverage⁴ • Number of biodiversity outreach or public awareness events held in the past 12 months
<p>Notes:</p> <ol style="list-style-type: none"> 1. Source: World Council on City Data (based on ISO 37120:2014). Category: recreation. Alternative indicator: Area of public and green space as a % of total city space (UN SDG indicator 11.7.1). 2. Definition of multi-functional green surfaces – performing at least two of the following functions: (a) cooling through tree canopy cover, green roofs, or green walls, (b) water management through wetlands, stream buffers, and permeable surfaces, (c) recreation through parks and/or greenways, and (d) food growing. Adapted from STAR Communities (© 2015). 3. UK public data is available at the local authority level. Canopy cover is an indirect measure of carbon storage and cooling effect of vegetation. As a general rule, a 10% increase in canopy cover reduces the temperature by about three degrees. Benchmarks: Singapore City Biodiversity Index scoring: 0 points: < 10.5% / 1 point: 10.5% - 19.1% / 2 points: 19.2% - 29.0% / 3 points: 29.1% - 59.7% / 4 		

points: > 59.7%. /// [Kiri Bird \(2015\)](#). SCORE tool target: 40%.
Performance thresholds based on a colour rating system: red: < 6.66% / orange: 6.66% - 13.33% / yellow: 13.33% - 20% / green: > 20%.

Sustainable water

Outcomes to consider	Phase	Suggested indicators
<ul style="list-style-type: none"> • Low potable water consumption • Low flood risks and damage • Water pollution is avoided • Wet habitats are created or improved 	<i>Design</i>	<ul style="list-style-type: none"> • % of total hard surface for the site (including roofs) designed for rain water harvesting¹ • % surface area that accommodates stormwater infiltration² • % of new residential addresses built on land at risk of a 1-in-100-year flood³
	<i>Construction</i>	<ul style="list-style-type: none"> • Construction-related water consumption per built square metre of floor space
	<i>Operation</i>	<ul style="list-style-type: none"> • Average residential potable water consumption per capita (litres / day) • Average total potable water consumption per capita (litres / day) • % of wastewater recycled

Notes:

1. Benchmark: [BREEAM Communities](#). Two credits: 5% to 25%. Three credits: 26% to 50%. Four credits: more than 50%. Note: any rainwater collection system is designed in accordance with BS 8515:2009 (to ensure both the demand and yield for the building will be considered when sizing the tank) and the collection area measured in accordance with BS EN 12056-3:2000.
2. Include artificial permeable surfaces. Benchmark and calculations: [Singapore City Biodiversity Index](#). Proportion of all permeable areas to total terrestrial area of city (excluding marine areas). Calculation: $(\text{Total permeable area}) \div (\text{Total terrestrial area of the city}) \times 100\%$. Benchmarks. 0 points: < 33.1% / 1 point: 33.1% - 39.7% / 2 points: 39.8% - 64.2% / 3 points: 64.3% - 75.0% / 4 points: > 75.0%. The Singapore indicator includes areas identified as 'natural areas' plus other parks, roadside, etc. but excludes artificial permeable surfaces. However, it is suggested that you also include artificial permeable surfaces.
3. Aim for 100%, unless built to highly flood resilient standards (a minimum is that all properties have flood risk insurance).

Local and sustainable food

Outcomes to consider	Phase	Suggested indicators
<ul style="list-style-type: none"> • Lower impact food • Fish purchased is sustainable • More humane and plant-based diets • Healthy, fresh food • On-site food growing • Fairer food supply chains • Secure and resilient food supplies • Less food waste 	<i>Design</i>	<ul style="list-style-type: none"> • m² of food growing space per dwelling unit¹ • Average distance of dwellings from a healthy food outlet, via pathways (m)
	<i>Construction</i>	<ul style="list-style-type: none"> • % of construction-phase catering that follows an ethical and sustainable food policy²
	<i>Operation</i>	<ul style="list-style-type: none"> • % of people checking packaging for sustainable or ethical food, by type (local and seasonal fruit and veg / organic / meat and dairy / fish / eggs / Fairtrade)³ • % of residents with (a) low-meat or fish-only diets, (b) vegetarian diets and (c) vegan diets³ • % of communal food growing space in use during Spring and Summer months • % of households making use of growing spaces or allotments at least once per month • Number of fruit trees per hectare and dwelling unit
<p>Notes:</p> <ol style="list-style-type: none"> 1. Benchmark: LEED-ND recommended growing spaces by project density: 18.5 m²/dwelling unit (DU) for densities greater than 17.5 DU/ha up to 35 DU/ha; 9 m²/DU for densities greater than 35 DU/ha up to 55 DU/ha; 7.5 m²/DU for densities greater than 55 DU/ha up to 69 DU/ha; 6.5 m²/DU for densities greater than 69 DU/ha up to 87 DU/ha; 5.5 m²/DU for densities over 87 DU/ha. 2. Prioritising more sustainable, local, seasonal, organic and plant-based diets where possible, and if animal products are used: free-range eggs, outdoor-reared or organic meat and dairy, and sustainably sourced fish. 3. See the additional guidance document on resident surveys for further details. 		

Travel and transport

Outcomes to consider	Phase	Suggested indicators
<ul style="list-style-type: none"> • More walking and cycling • Public transport is accessible and popular • More car-sharing • Compact, walkable communities • Non-polluting personal vehicles • Affordable transport • Lower emissions due to air travel • Less commuting and more flexible and remote working 	<i>Design</i>	<ul style="list-style-type: none"> • % of homes facing car-free roads or paths • Average parking spaces per dwelling¹ • % of residences within 0.5km of public transport running at least every 20 minutes • Number of secure bicycle parking spaces per resident
	<i>Operation</i>	<ul style="list-style-type: none"> • % of children going to school by public or active transport² • % of residents using a personal petrol, diesel or hybrid vehicle more than two days per week² • % of residents using active transport more than two days per week² • % of residents using a personal petrol, diesel or hybrid vehicle sometimes, but less than two days per week² • % of residents using active transport sometimes, but less than two days per week² • % of residents commuting by alternative to personal petrol, diesel or hybrid vehicles² • % of households making use of transport options (e.g. ride sharing, car club, bike rental)² • % of residents taking a flight longer than four hours in past twelve months² • Average number of personal vehicles per dwelling³
<p>Notes:</p> <ol style="list-style-type: none"> 1. Excluding car rental spaces and disabled spaces. Aim for one or less in suburban developments, or zero in inner-city locations (achieved at the One Brighton development). 		

2. See the additional guidance document on resident surveys for further details.
3. May be estimated from resident surveys or site surveys.

Materials and products

Outcomes to consider	Phase	Suggested indicators
<ul style="list-style-type: none"> • Low impact construction materials • Healthy materials • Low impact products over life cycle • More reuse and sharing • A more circular economy 	<i>Design</i>	<ul style="list-style-type: none"> • Estimated embodied carbon of buildings (kgCO₂e/m²)¹ • % of buildings on brownfield sites that are repurposed rather than demolished, by floor space
	<i>Construction</i>	<ul style="list-style-type: none"> • % of timber or wood products reclaimed, reused or from a certified sustainable source² • % (by volume or weight) of road material that is locally reclaimed or constituted from recycled material³ • % (by weight and value) of materials which are locally reclaimed (from within a 100km radius) or A+ or A rated in BREEAM's Green Guide⁴ • Number of products containing VOCs
	<i>Operation</i>	<ul style="list-style-type: none"> • Number of goods shared/swapped in the community⁵ • % of local shops selling eco-friendly consumables

Notes:

1. A number of embodied emissions databases and calculators are available, such as the BRE [Green Guide](#).
2. Aim for 100%.
3. Benchmark: [BREEAM Communities](#). 1 credit for 15+%, 2 credits for 25-30%, 3 credits for 30+% credits. © BRE.
4. Benchmark: [BREEAM Communities](#). 1 credit for 40-60% A+ to B rating, 2 credits for 60+%, 3 credits for 80+% credits © BRE.
5. May be based on records from a communal share shop, sharing space, or Freecycle-style intranet.

Zero waste

Outcomes to consider	Phase	Suggested indicators
<ul style="list-style-type: none"> • High levels of reuse, recycling or composting • Less waste generated • A more circular economy • Less pollution and emissions due to waste • Safe waste disposal 	<i>Construction</i>	<ul style="list-style-type: none"> • Total quantity of construction phase waste (tonnes) • % of construction phase waste sent for reuse or recycling • % of building materials during demolition (by weight) that is recovered or salvaged for later use
	<i>Operation</i>	<ul style="list-style-type: none"> • Average waste per capita, residential and non-residential (tonnes / person)¹ • % of residential and non-residential waste reused, recycled or composted • % of homes composting organic waste
<p>Notes:</p> <ol style="list-style-type: none"> 1. Data can be obtained from weighting technology or via a waste audit (see 'BedZED seven years on' report). Local averages are often available. 		

Zero carbon energy

Outcomes to consider	Phase	Suggested indicators
<ul style="list-style-type: none"> • Efficient buildings and appliances • Energy supplied by renewables • Low emissions due to buildings • Less fuel poverty • Clean fuels in the home • Energy is affordable 	<i>Design</i>	<ul style="list-style-type: none"> • Estimated average annual solar PV output - in total, per capita and per dwelling unit (kWh per annum) • Peak installed solar PV capacity – in total, per capita and per dwelling unit (kW) • Rating according a national energy efficiency benchmark
	<i>Construction</i>	<ul style="list-style-type: none"> • Construction-phase energy consumption (kWh) • % of construction-phase electricity from renewable sources • Emissions due to construction-phase energy use in total (tCO₂e) and by floor space (kgCO₂e/m²) • Air leakage rates (units vary)¹
	<i>Operation</i>	<ul style="list-style-type: none"> • % of operational energy coming from on-site renewables • % of operational energy coming from renewables overall² • Residential and non-residential energy consumption by type of energy, by floor space (kWh/m²/year) and per capita (kWh/m²/year)³ • Emissions due to residential energy consumption, by energy type and in total, by floor space (kgCO₂e/m²/year) and per person (kgCO₂e/person/year)⁴ • Average estimated annual energy bill savings per person and per household⁵
<p>Notes:</p> <ol style="list-style-type: none"> 1. Measured at the end of the construction through air tightness tests. 2. Aim for 100%. 3. Where possible, compare with industry averages. 		

4. This requires an estimate of occupancy levels. If enough survey data is available this can be used, by matching home occupancy levels to the number of bedrooms and then adjusting the occupancy total according to the proportion of different sized dwellings.
5. Compare with national industry benchmarks for averages for new developments, where available.