











Zero/Low carbon eco village in UK

이인선 – Reestor Ltd
ZEDfactory Ltd

2015 05 08

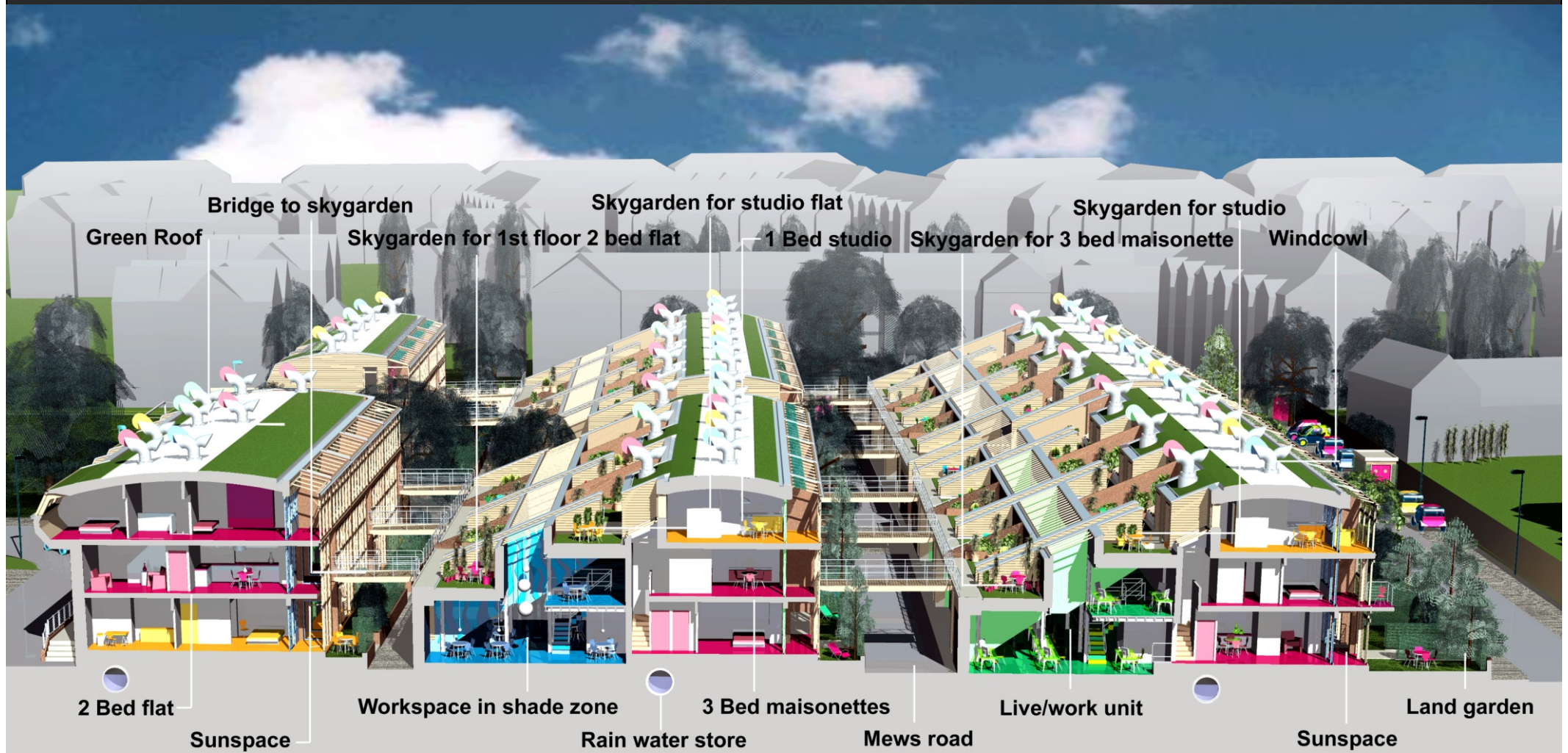
Ecological footprints for UK lifestyle in hectares per person

Based on a 4-person household

		Car mileage	Car ownership (manufacture, maintenance, road infrastructure)	Public Transport	Air travel	Electricity & gas	Water	Domestic Waste	Office Footprint (energy & paper)	Food (including transport but not packaging)	Overall eco footprint		
Typical UK lifestyle	Owens car Holidays by plane every year Recycles 11% Eats out-of-season, highly packaged, imported food	0.90	0.41	0.00	0.30	0.45	0.002	1.70	0.80	1.63	6.19		
		10,000 km/yr				22,500 kWh electric & gas	140 litres/day		non renewable energy and virgin paper				
BedZED with conventional lifestyle	Owens car and commutes to work by public transport Holidays by plane every year Recycles 60% Moderate meat eater & some imported food	0.45	0.32	0.30	0.30	0.10	0.001	1.02	0.80	1.06	4.36		
		5,000 km/yr		4,000 km/yr		waste wood CHP including credit for landfill diversion	91 litres/day		non renewable energy and virgin paper				
BedZED ideal	Lives and works at BedZED Recycles office paper No car (member of ZEDcars club)	0.09	0.04	0.30	0.15	0.10	0.001	0.34	0.16	0.72	1.90		
	Holiday by plane every 2 years Recycles 80% at home Low meat diet with local fresh food	1,000 km/yr	20 people per club car	4000 km/yr		waste wood CHP including credit for landfill diversion wood CHP	91 litres/day		joins closed loop office paper scheme				
Global average											2.40		
Global available	Leaving 10% of bioproductive land for wildlife										1.90		

- what right do we have to consume more than our fair share of limited international resource ?

BEDZED™



Construction specification

	보통 주택	ZED 단지
% FSC 검증된 목재	0	80
% 재활용,재생된 건축자재	0	15
PVC 사용도 kg/m2	-	0
VOC 사용도 litres/m2	-	0
60 km 이내 에서 구매된 건축자재 무게의 %		52
주거내 에서 재활용되는 종류	-	종이/캔 플라스틱/빈병
LIFE SPAN	60 년	120 년

	보통 주택	ZED 주택
단열도 외벽/바닥/지붕/ 창호 W/m2k	0.35/0.25 /0.25/2.0	0.1/0.11 /0.11/1.2
공기 밀폐도	10ach @ 50 Pa	2ach @ 50 Pa
샤워 흐름도	14 l/s	7.2 l/s
Flush capacity for WC	8 l	3/5 l
Water for flushing	수돗물	재생 물
도로 포장 /SUDS	콘크리트	porous paving

전기 -년간 **2,579 kWh.** 평균치보다 **45%** 정도 낮음

온수/난방- -년간 **3,526 kWh.** 평균치보다 **81%** 정도 낮음

물 -사람당 **72 litres.** 평균치보다 **58%**정도 낮음

재활용 쓰레기 - **50%**

일반 쓰레기 - 평균치보다 **68%** 정도 낮음 **104kg**

BedZED Monitoring Report 2007

EXPOSED
THERMAL
MASS

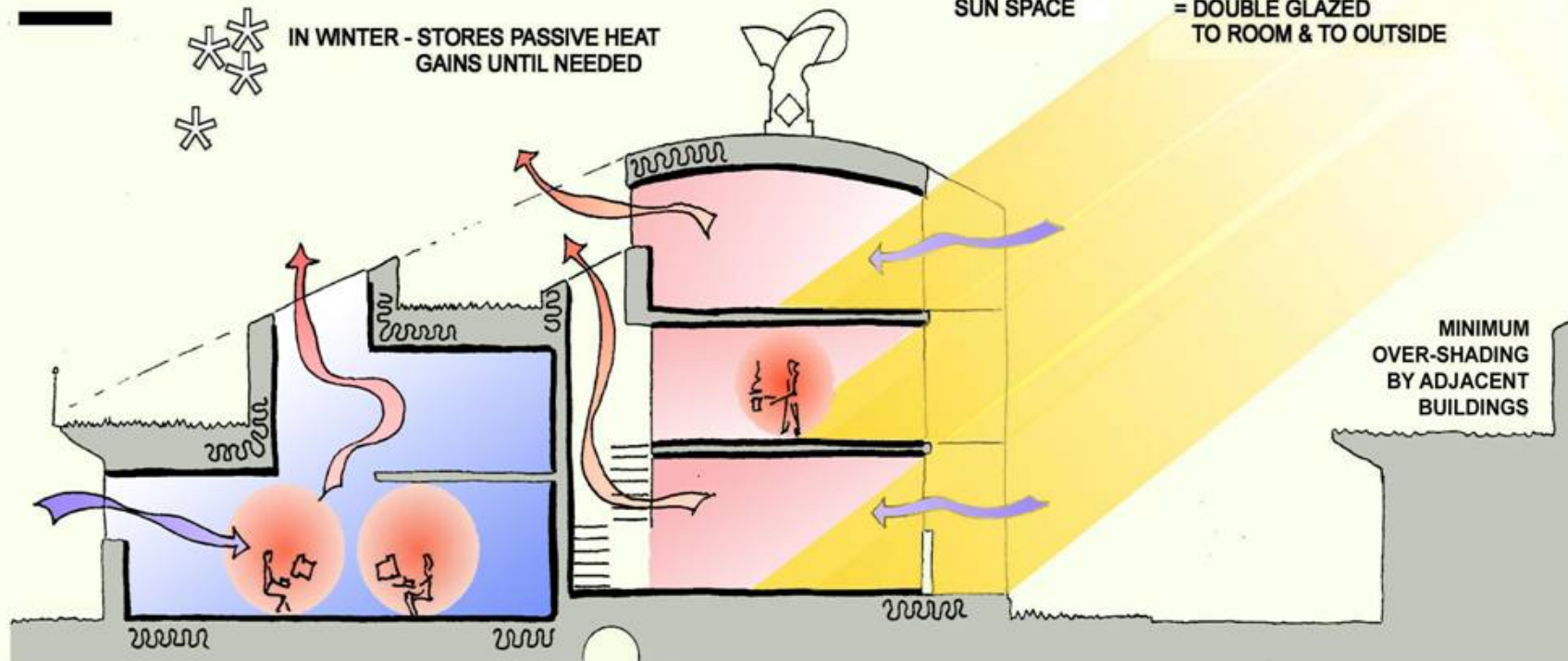


IN SUMMER - PRODUCES COOLING



IN WINTER - STORES PASSIVE HEAT
GAINS UNTIL NEEDED

HIGHLY INSULATED = $0.1 \text{ W/m}^2\text{k}$
WINDOWS = TRIPLE GLAZED
AIRTIGHTNESS = 2 AC/HR @ 50Pa
SUN SPACE = DOUBLE GLAZED
TO ROOM & TO OUTSIDE



MINIMUM
OVER-SHADING
BY ADJACENT
BUILDINGS

WORK

CIRCULATION

HOME

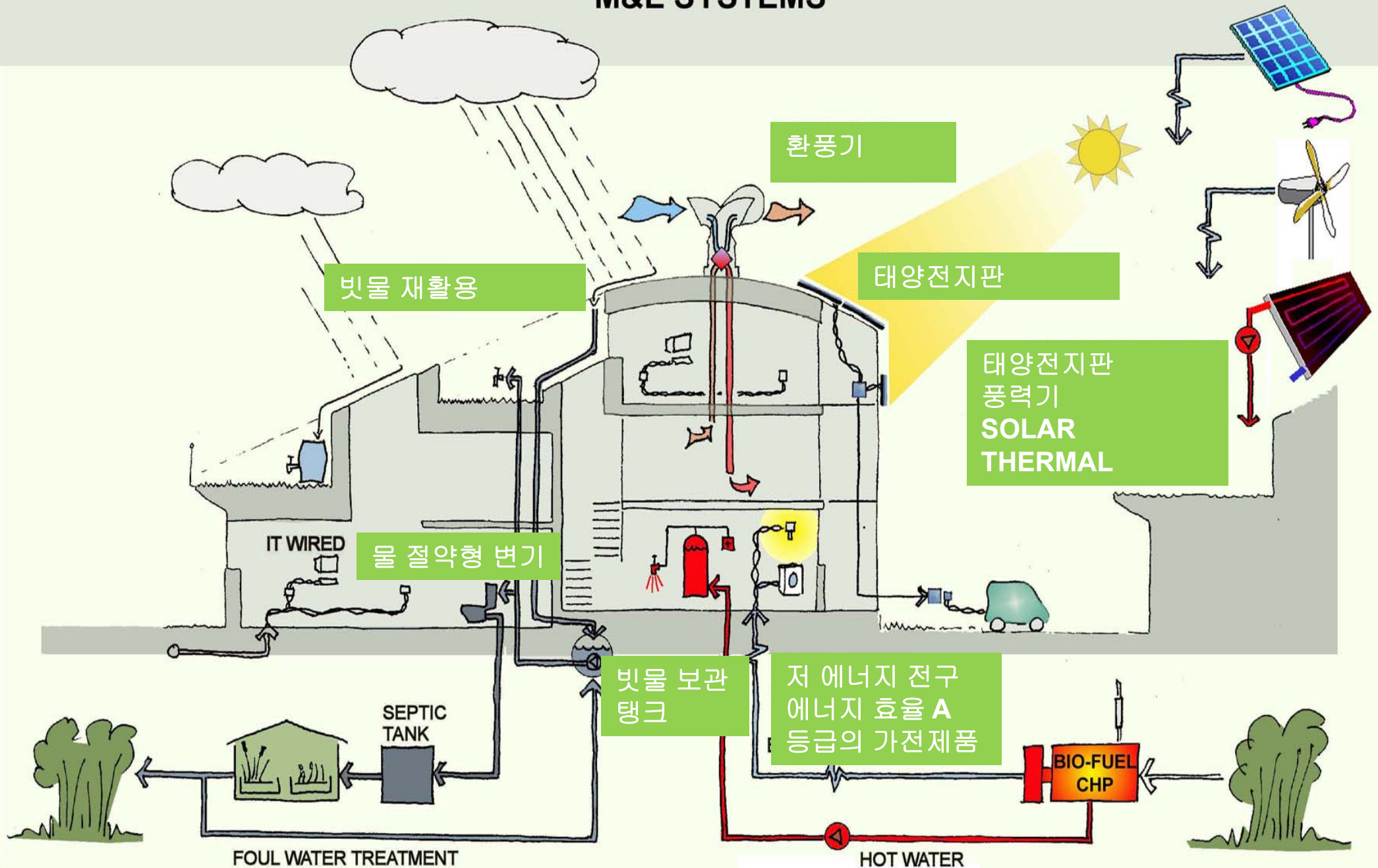
SUN SPACE

NORTH FACING WINDOWS
GOOD DAYLIGHT
MINIMUM SOLAR HEAT GAIN

EXTENSIVE SOUTH FACING GIVING
GOOD, PASSIVE SOLAR HEAT GAIN
GLAZED BUFFER SUN SPACE.
MINIMUM NORTH GLAZING FOR
DAYLIGHT.

ARUP

M&E SYSTEMS

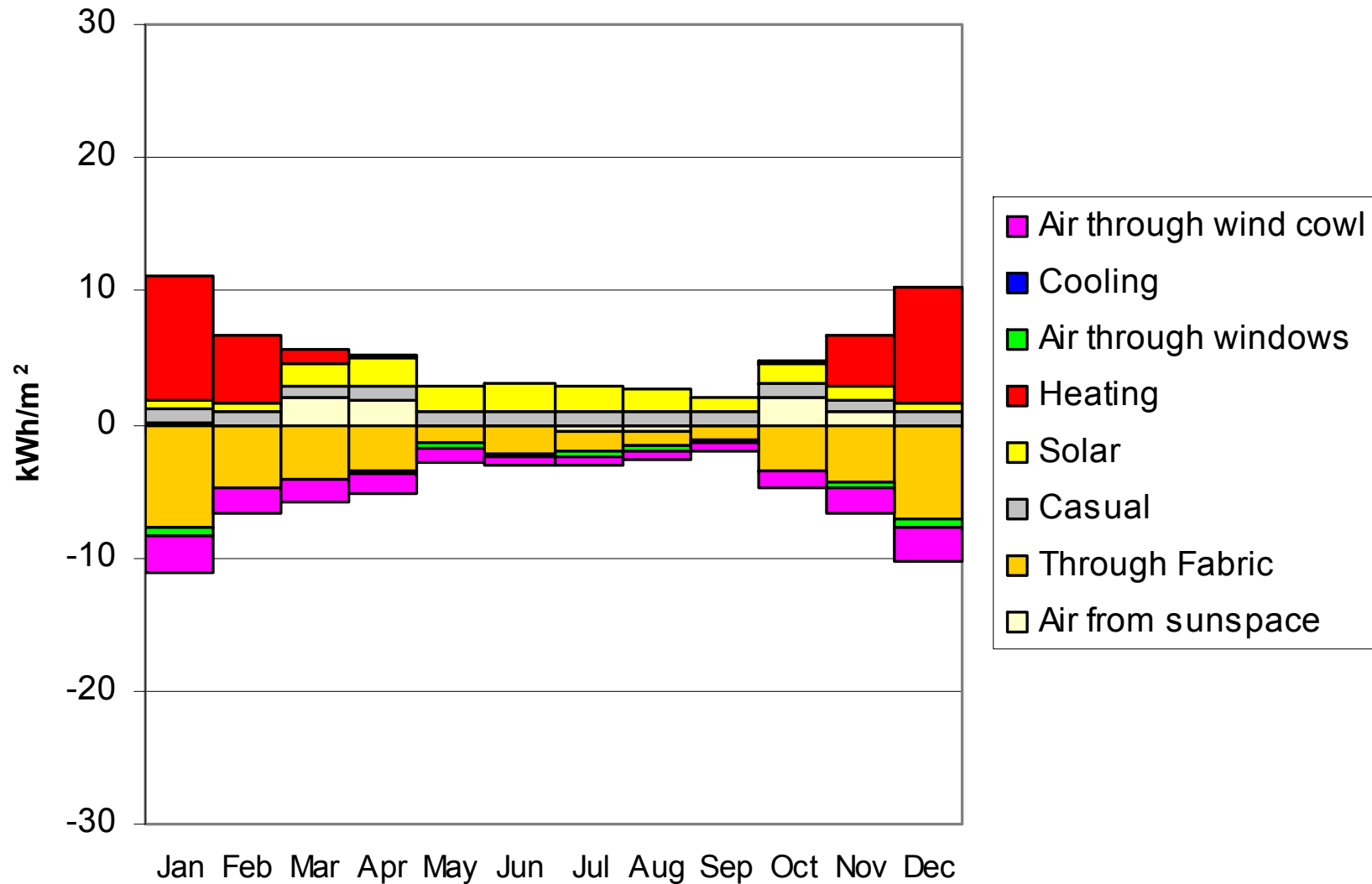


[기본 개념도]

ARUP


Heat Energy Characteristic

heating 18, cooling 25 (not needed)



ZED fabric standards

- south facing unit
- ruralZED typology
- sunspace provides heating for two months either side of heating season
- heat load reduced to 1.5 kw



Tram link to
Wimbledon
and Croydon

Ecology
park

Bus
stop

school

shops

Hackbridge Station

20 mins to London
Victoria main line
terminus





Key to ZED strategies is giving residents the opportunity to give up the family car and its associated carbon emissions. ZED residents all have access to a pool of electric cars.

Transport

	Local average	BedZED	Reduction
Car ownership (vehicles/person)	1.2	0.6	50%
Mileage – private fossil fuel vehicles (miles/year/person)	6,000	2,061	65%
CO2 emissions from private transport (tonnes/year)	2.2	0.9	60%

- Saves 1.3 tonnes CO2 / person / year



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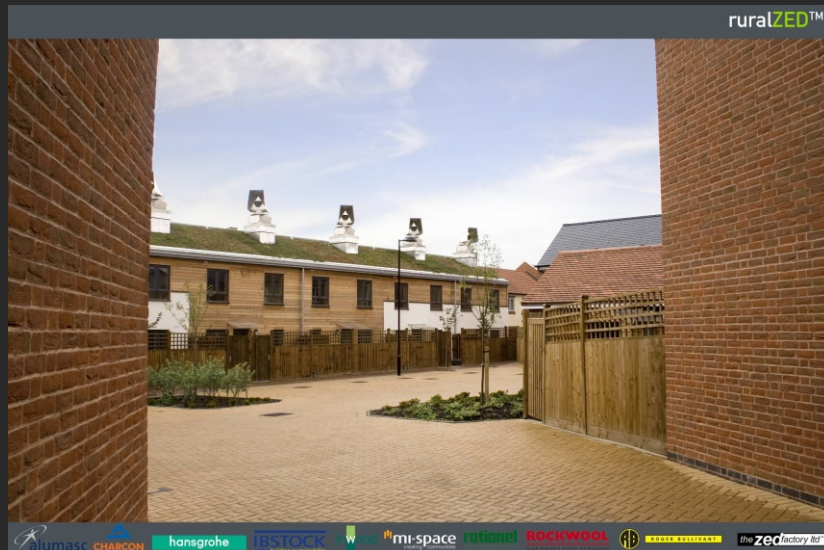
- case studies - BedZED



UPTON SITE D



- 총 단지에는 5000세대, 280,000m²의 공업지대, 공원 및 편의시설 계획. 현재 도시의 외각에 위치하고 개발단지는 도시 전략상 중요한 **extension** 역할.
- English Partnerships에 의한 관리 (Homes and Community Agency).
- Design code로 통합된 디자인 모색.



THE CODE FOR SUSTAINABLE HOMES



FINAL CERTIFICATE

(Issued at the Post Construction Stage)

ISSUED TO:
19 Mill Pond Drive,
Upton,
Northampton,
Northants NN5 4EW

The sustainability of this home has been independently assessed at the Post Construction Stage and has achieved a Code Rating of 6 out of 6 stars under the April 2007 version



Above
Regulatory
Standards

Current
Best
Practice

Highly
Sustainable
and Zero Carbon

The next page sets out how this home achieved its rating in the nine categories.

Licensed Assessor Simon Roberts	Assessor Organisation ARUP
Client Mansell Construction Services Limited	Developer Metropolitan Housing Partnership
Architect Bill Dunster Architects ZEDFactory Ltd	Certificate Number BRE-A-CSH-SR05-1-0002
Date 14th May 2009	Signed for and on behalf of BRE Global Ltd



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breglobal

THE CODE FOR SUSTAINABLE HOMES



FINAL CERTIFICATE

(Issued at the Post Construction Stage)

Certificate Number: BRE-A-CSH-SR05-1-0002

Score: 91

What Your Code Star Rating Means

Combined Score	36-47	48-56	57-67	68-83	84-89	90-100
Stars	1	2	3	4	5	6

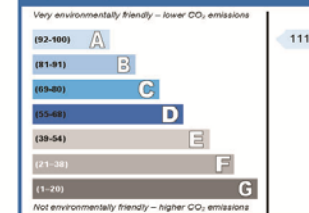
The Code for Sustainable Homes considers the effects on the environment caused by the development and occupation of a home. To achieve a star rating a home must perform better than a new home built to minimum legal standards, and much better than an average existing home.

How this home scored

Category	Percentage of Category Score attained											What is covered in the category
	0	10	20	30	40	50	60	70	80	90	100	
Energy	100											Energy efficiency and CO ₂ saving measures
Water	100											Internal and external water saving measures
Materials	87											The sourcing and environmental impact of materials used to build the home
Surface Water Run-off	100											Measures to reduce the risk of flooding and surface water run-off, which can pollute rivers
Waste	100											Storage for recyclable waste and compost, and care taken to reduce, reuse and recycle construction materials
Pollution	25											The use of insulation materials and heating systems that do not add to global warming
Health & Wellbeing	100											Provision of good daylight quality, sound insulation, private space, accessibility and adaptability
Management	100											A Home User Guide, designing in security, and reducing the impact of construction
Ecology	55											Protection and enhancement of the ecology of the area and efficient use of building land

Further detailed information regarding The Code for Sustainable Homes can be found at www.communities.gov.uk/thecode

CO₂ Rating



The CO₂ rating is a measure of a home's Carbon Dioxide (CO₂) emissions. This rating is shown on your Energy Performance Certificate as the Environmental Impact Rating. This Certificate is available from the seller, and also includes information on how you can improve the home's performance.

The Code measures the sustainability of a home as a complete package, and takes into account other aspects of energy use as well as wider sustainability issues, such as water and waste.

The CO₂/Environmental Impact Rating is shown here for information only and does not form part of The Code for Sustainable Homes. Neither BRE Global nor the assessment organisation is responsible for the accuracy of this number.

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EPC Number: 9153-2850-6429-0598-8101

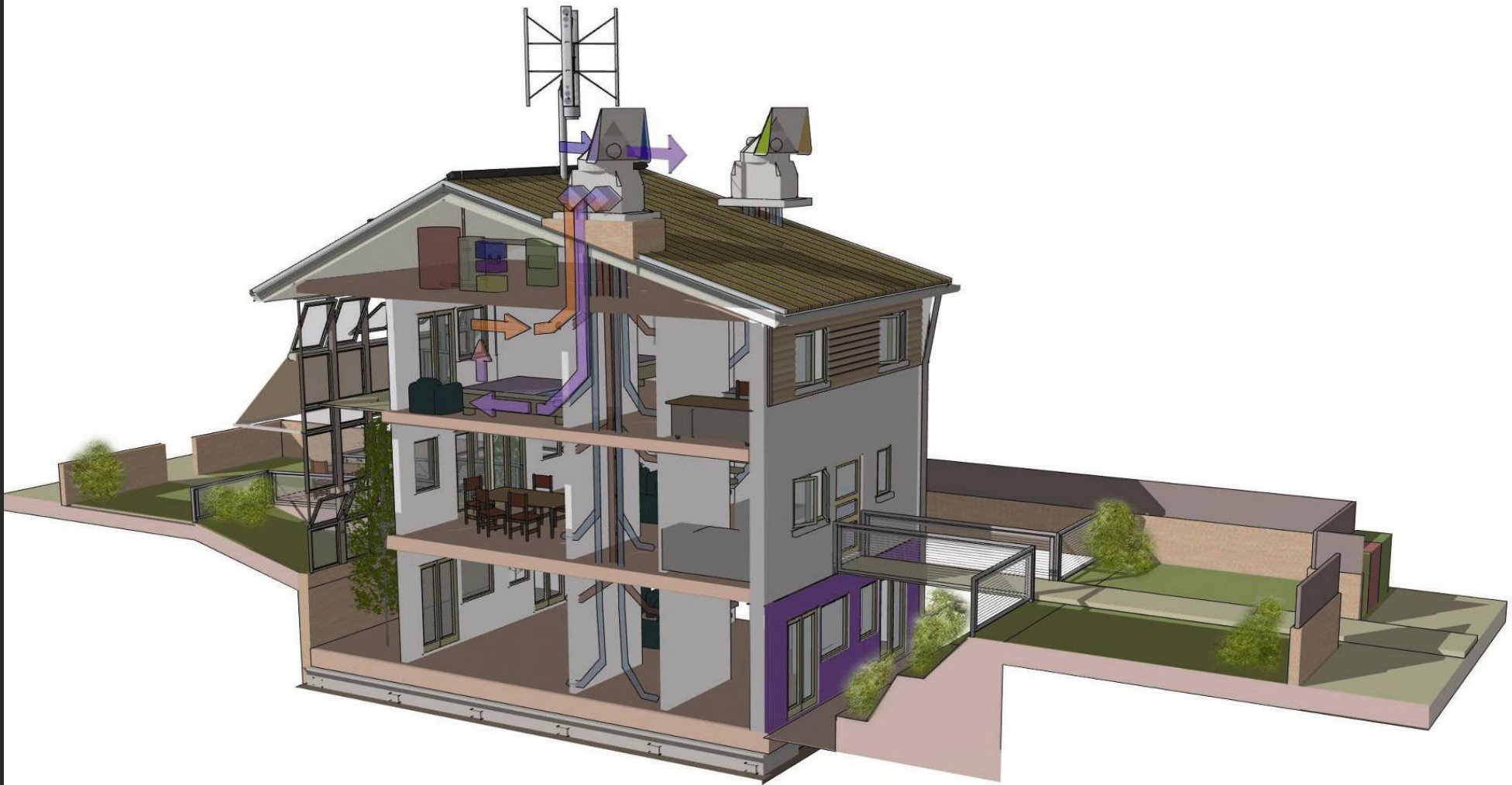


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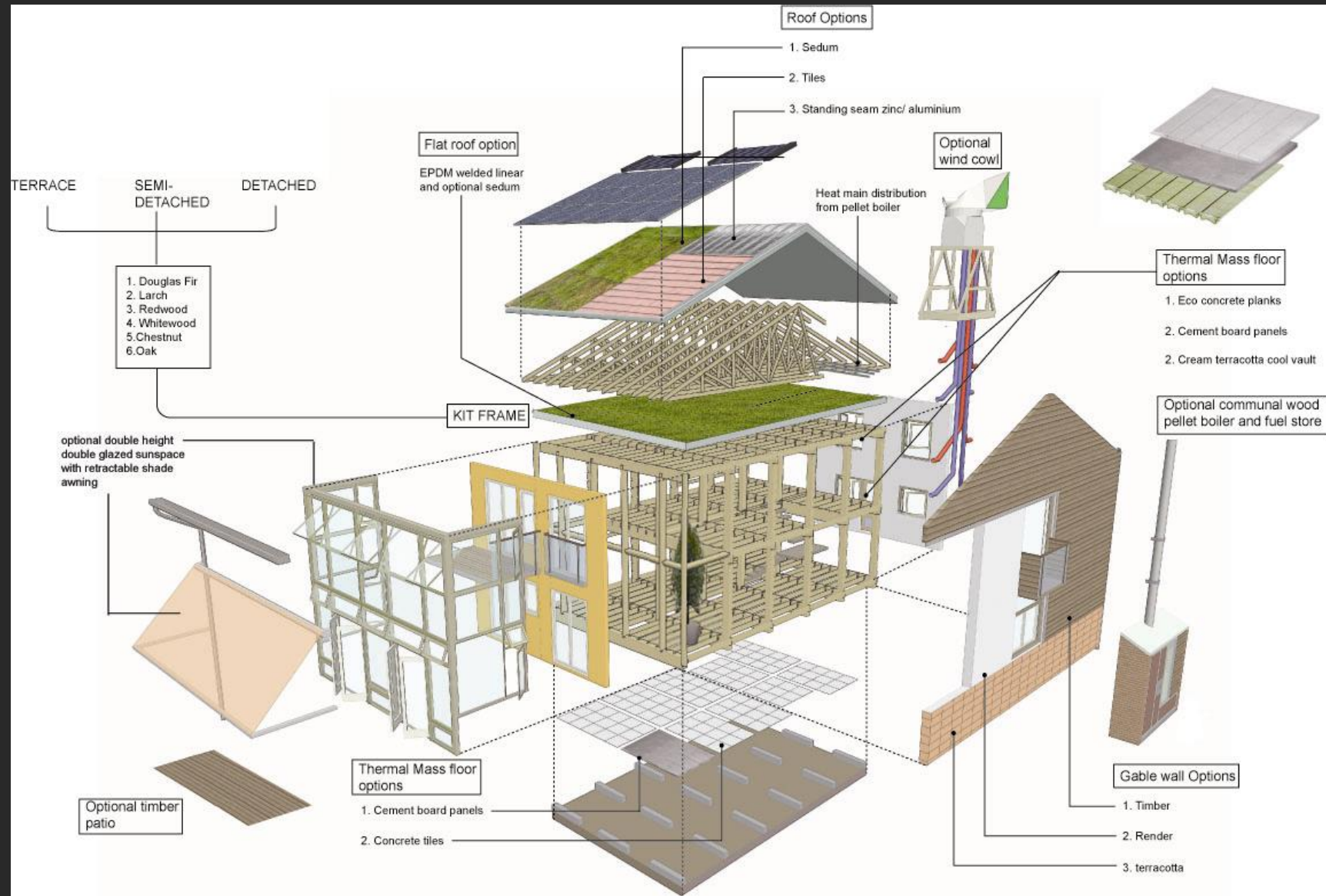


The dry assembly ruralZED 조립형 주택키트- 적층 목재를 사용한 골재와 **thermally mass** 여름에는 시원하고 겨울에는 따뜻함을 유지.





자연환기 및 자연채광형 설계·고성능 단열·고기밀 창호 등으로 냉 난방 에너지 소비를 최소화하고 20개의 180w pv 와 태양광 biomass stove 나 boiler 로 에너지 자립도 형성.



기본 시스템에 다양한 추가 **option** 가능.

Site Waste 저감



다양한 주거형태 가능



방향에 따른 다양한 지붕형태 가능



지붕모양, 외벽 **finish**도 지역의 특성에 맞게 조절할 수 있음 (**timber, terracotta tile, render** 등으로 마감 가능).







Life Time Homes Standard

노인들이 불편없이 독립적인 생활을
할수있도록 고려한 총 **16**가지의
항목의 기준.

거주자가 불편없이 이동할수
있도록 고려하고 위생과 환경,
안전부분에서도 정해진 수준이상이
되어야함.)



건물에 부착된 신재생에너지는 비싼 대규모의 **infrastructure** 가 없어도 에너지 공급 가능.

저밀도 개발지역에 적용 가능

수요가 많아지면 단지내에서 목재 골재를 만드는 공장을 유치하고 직접 생산하여 지역에 일자리를 창출하고 경제적인 개발을 유도할 수 있음.



NW BICESTER

NW Bicester is a pioneering new development led by A2Dominion to create the UK's first eco town.



- Providing up to 6,000 homes.
- Ensuring a mix of affordable housing is included.
- Ensuring 40% of the overall eco town comprises of open spaces and green landscape infrastructure.
- Creating 1 job per home within a sustainable travel distance.
- Achieving a zero carbon energy standard for all buildings.
- Achieving a shift from car use (to below 50%) to other more sustainable travel.
- Ensuring homes are built to a minimum of Code 5 for sustainable Homes Level and BREEAM excellent standards.





- To allow for future climate change adaptation by incorporating forward thinking technologies and design.
- Providing real time energy and travel monitoring in every home.
- Ensuring high levels of energy efficiency in the fabric of the buildings and their design.
- To provide primary schools located within 800m of all homes.
- To enable and encourage local food production.
- Attaining a net gain in local bio-diversity.
- Aspiring to water neutrality.
- Creating a management program to ensure zero waste goes to landfill during construction.
- Making commitment towards a Local Management Organisation.