



BREEAM and CSH in FRESH* Context

FRESH – Primary Objective:

❖ To impact the regional development plan and embed eco-innovation into the regional innovation strategies of the partner regions in the context of Sustainable Value Creation (SVC).

*
Forwarding
Regional
Environmental
Sustainable
Hierarchies



Dr Bill Gaughran 10/2011



FRESH - Sustainable Value Creation (SVC)

Generic description in the context of FRESH:

***SVC** – Continually creating and adding value, economic, environmental and societal, resulting from an innovative approach to sustainable planning and construction, including all interventions allied to these activities, and in consideration of resource and energy eco-efficiency.*





FRESH - Resource Productivity

“The future belongs to those who understand that doing more with less is compassionate, prosperous and enduring, and thus more intelligent, even competitive”

Paul Hawken (Environmentalist)



Standards - FRESH

- ❖ Standards and assessments need to significantly contribute to eco-innovation, SVC and resource productivity
- ❖ Need to be robust and implementable
- ❖ Should have a well recognised certification body
- ❖ Should be applicable to regional policies relating to innovative sustainable development
- ❖ Should be acceptable to all stakeholders



Resource Productivity - Descriptors

“In formal terms, ‘resource productivity’ is a ratio: welfare / use of nature. This ‘eco-efficiency’ ratio expresses how much benefit or welfare is achieved from one unit of ‘nature’. Increasing ‘eco-efficiency’ means therefore, ‘achieving more from less’ which is an important element of sustainability”.

resource productivity = welfare / use of nature

eco-intensity = use of nature / welfare

Moll, S., Gee D. (eds.) (1999), *Making sustainability accountable: Eco-efficiency, resource productivity and innovation; Proceedings of a workshop on the occasion of the Fifth Anniversary of the European Environment Agency (EEA) 28 - 30 October 1998 in Copenhagen, Topic report No 11/1999, Copenhagen, European Environment Agency*



Resource Productivity – OECD* 2008

RESOURCE PRODUCTIVITY:

Improving resource productivity helps promote robust, healthy, equitable and sustainable future growth and prosperity. For the purposes of this document *, the term “resource productivity” is therefore put in a welfare perspective and:

is understood to contain both a **quantitative dimension** (e.g. the quantity of output produced with a given input of natural resources) and a **qualitative dimension** (e.g. the Environmental **impacts** per unit of output produced with a given natural resource input).

*

Recommendation of the Council on Resource Productivity
Adopted by the OECD Council on 28 March 2008





Resource Productivity

- To Synthesise:

**Doing much *more*,
with much *less*,
for very much *longer*.**

Eurostat definition

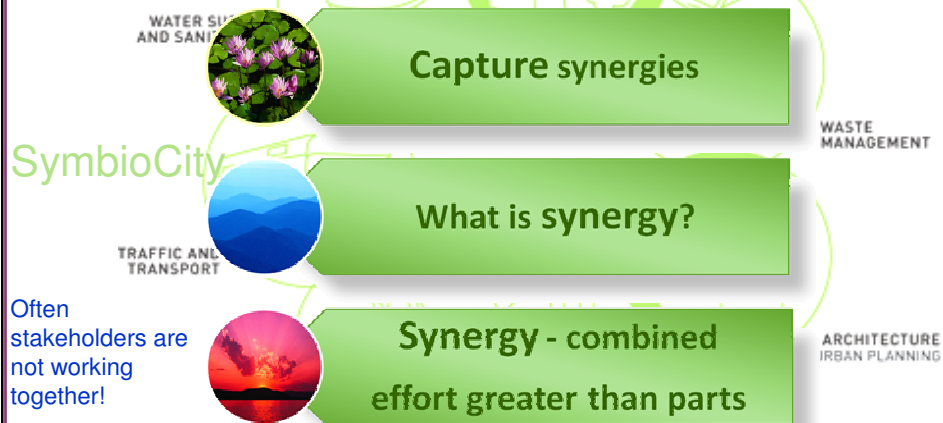
“**Resource productivity** measures the efficiency with which an economy uses energy and materials. It also shows the natural resource inputs needed to achieve a given economic output.”

Eurostat 2010



Resource Productivity - WSD

Whole-system design (WSD) - optimizes an entire system to:





Whole-system Design

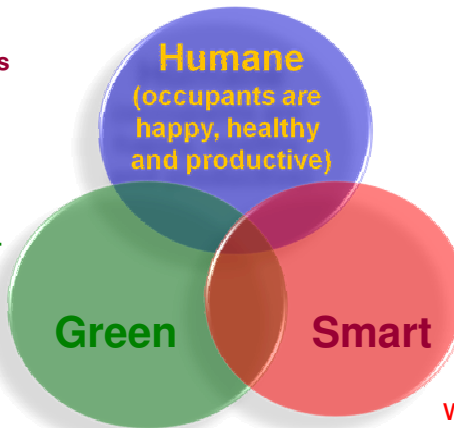
WSD typically reveals lasting, elegantly frugal solutions with multiple benefits, which enable us to transcend ideological battles and unite all parties around shared goals. (RMI.org)



Pillars of Sustainable Construction

FRESH focus and applications

Green
(siting, water energy, and material efficiencies reduce the building footprint)



Smart
(fully adaptive to new conditions while being cost competitive)

Sustainable Construction

Shanthini 2010



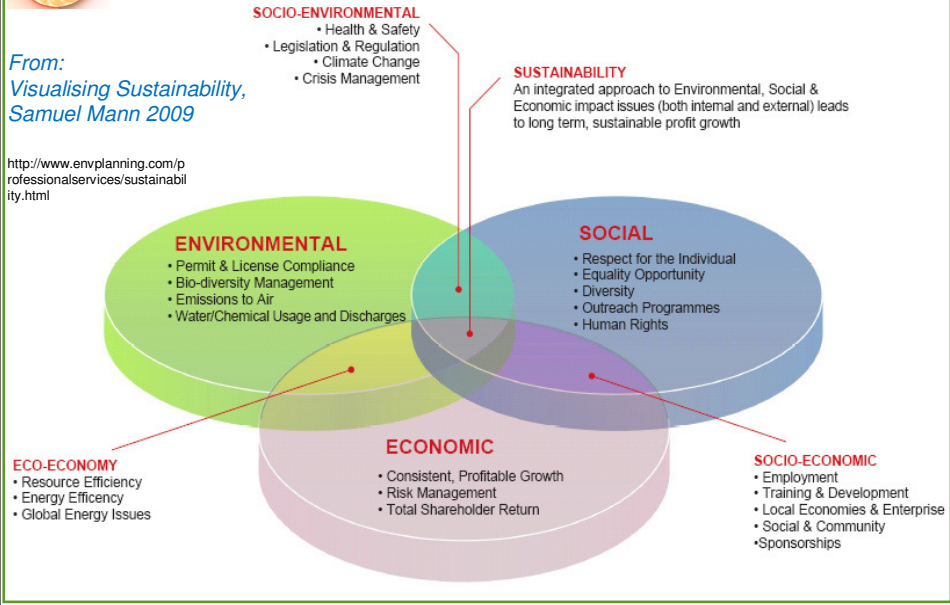


FRESH - ASSESSMENT TOOLS

Assess What?

From:
Visualising Sustainability,
Samuel Mann 2009

<http://www.envplanning.com/professionalservices/sustainability.html>



FRESH — Resource Productivity

The Broader Picture

“... Human subtlety will never devise an invention more beautiful, more simple or more direct than does nature, *because in her inventions nothing is lacking, and nothing is superfluous.*” *DaVinci*

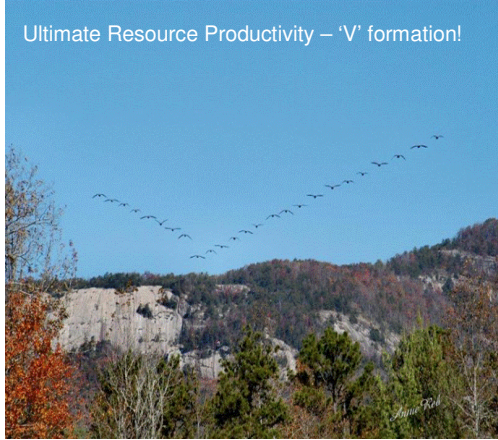
“The first rule of sustainability is to align with natural forces, or at least not try to defy them, ...

Paul Hawken



FRESH – The societal pillar (lessons learned)

Ultimate Resource Productivity – ‘V’ formation!



Wild Geese – sustainability and inclusivity!



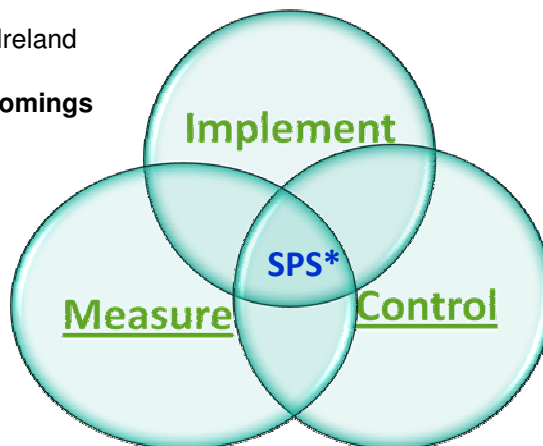
- ❖ As each bird flaps its wings creates uplift for the one behind
- ❖ The ‘V’ adds 71% distance above solo flying
- ❖ If a goose falls out of formation it feels the drag and returns
- ❖ *When a goose gets sick or wounded, two other geese drop out of formation and follow it down to help and provide protection. They stay with the unhealthy member of the flock until it is either able to fly again or dies.*



BREEM and CSH in FRESH

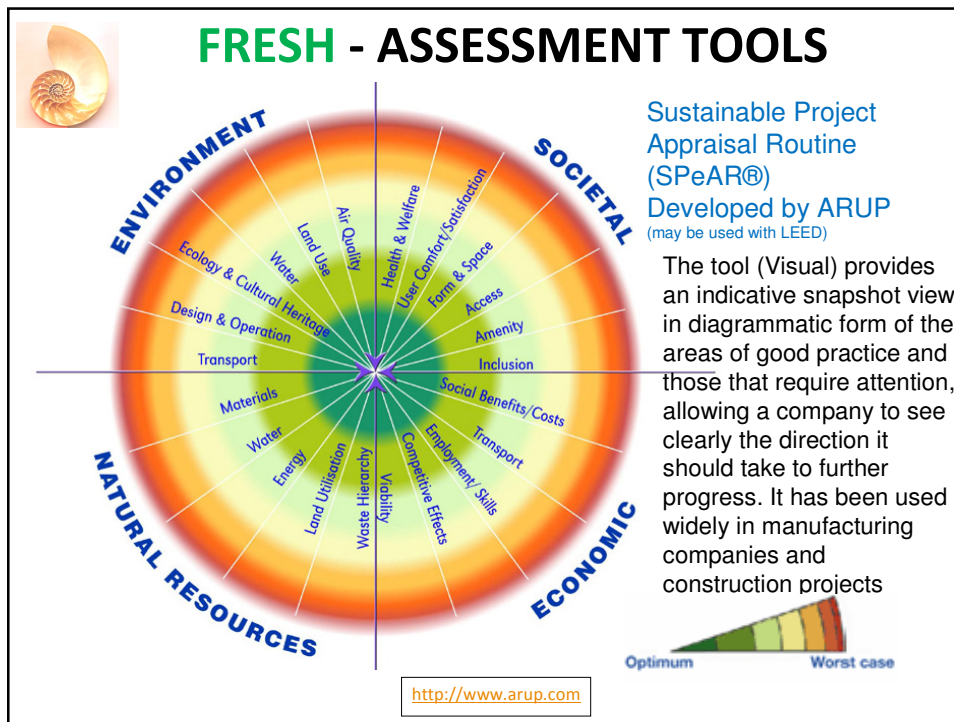
Good Practice in Ireland and elsewhere;
Identified shortcomings

B. Regs.
BER
Other



*Sustainable Planning Strategies





FRESH - Assessment Tools

- **LEED™** (Leadership in Energy and Environmental Design) is produced by the United States Green Building Council.
- **CASBEE** (Comprehensive Assessment System for Building Environmental Efficiency) is a Japanese sustainability assessment method for buildings. It is a suite of tools that covers the life-cycle stages of the building.
- **GBTool** (Green Building Tool) is internationally applicable and was developed to assess buildings for the Green Building Challenge (GBC). The GBC is an international competition held every two years. It is a very adaptable assessment method; however this adaptability requires extensive technical knowledge and ability to implement it.



FRESH - Assessment Tools

- • **Green Globes:** A North American assessment method developed by the Green Building Initiative (Yudelson, 2008). This assessment is growing in use in recent years across North America.
- • **Green Star:** An Australian national, voluntary environmental rating system that evaluates the environmental design and construction of building. It is run by the Green Building Council of Australia (GBCA)



FRESH - Assessment Tools

BREEAM (Building Research Establishment's Environmental Assessment Method) *in their own words:* is the world's leading and most widely used environmental assessment method for buildings, with over 115,000 buildings certified and nearly 700,000 registered.

It sets the standard for best practice in sustainable design and has become the de facto measure used to describe a building's environmental performance.



FRESH - Assessment Tools

CONTROL!

BREEAM scheme can be used to assess the environmental impacts arising as a result of an individual building development (including external site areas) at the following stages:

- 1. Design Stage (DS) - leading to an **Interim BREEAM Certificate**
- 2. Post-Construction Stage (PCS) – leading to a **Final BREEAM Certificate**



FRESH - Assessment Tools

BREEAM – Areas assessed and weightings

BREEAM Section	Weighting (%)	
	New builds, extensions & major refurbishments	Building fit-out only (where applicable to scheme) 
Management	12	13
Health & Wellbeing	15	17
Energy	19	21
Transport	8	9
Water	6	7
Materials	12.5	14
Waste	7.5	8
Land Use & Ecology	10	N/A
Pollution	10	11



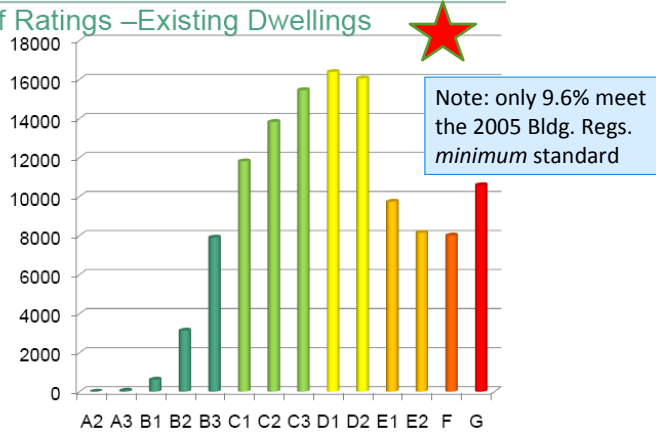
FRESH - Assessment Tools

Building Energy Ratings - BER



Distribution of Ratings –Existing Dwellings

Grade	Number
A2	12
A3	55
B1	620
B2	3,130
B3	7,901
C1	11,807
C2	13,820
C3	15,453
D1	16,380
D2	16,057
E1	9,734
E2	8,146
F	8,004
G	10,582



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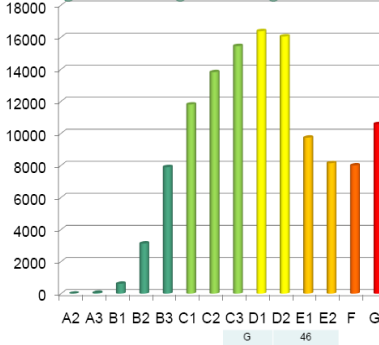
FRESH - Assessment Tools

Where to Focus!

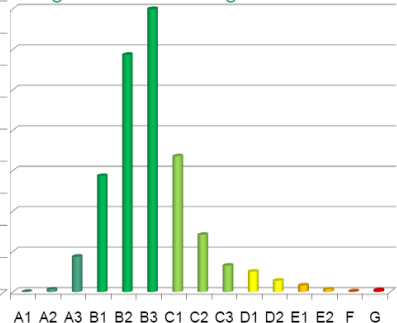


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Distribution of Ratings –New Dwellings



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Retro-planning!





FRESH - Assessment Tools

Code for Sustainable Homes (CSH)

The Code is an environmental assessment method for new homes based upon BRE Global's Ecohomes. It is the leading and most widely used holistic environmental assessment method for domestic buildings. The Code aims to protect the environment by providing guidance on the construction of high performance homes built with sustainability in mind and contains mandatory performance levels in 7 key areas.

<http://www.buildingsciences.co.uk/index.php?s=design>



FRESH - Assessment Tools

The assessment of the code looks at nine categories* (CSH, 2006):

Code category	Weighting	Weighting strength
Energy	36.4%	High
Water	9%	Medium
Surface water run-off	2.2%	Low
Materials	7.2%	
Waste	6.4%	
Pollution	2.8%	
Health & well-being	14%	Medium
Management	10%	
Site ecology	12%	

* Similar to BREEAM some say it fails to sufficiently address the social and ethical aspects relating to building





FRESH - Assessment Tools

Code for Sustainable Homes (CSH)

There are six levels of the Code that can be achieved.

Code Level	Number of Points required (Including minimum standards)	Energy Requirement: Percentage better than part L 2006
1 (^)	36	10%
2 (* *)	48	18%
3 (* * *)	57	25%
4 (* * * *)	68	44%
5 (* * * * *)	84	100%
6 (* * * * * *)	90	Zero Carbon Home

Table 1.2.1: Levels of the CSH (CSH, 2007).

Up to 2012 Code level three
 2012 Code level four
 2016 Code level six



FRESH – WHY BREEAM and CSH?

- ❖ Established good practices
- ❖ Robust assessment and control
- ❖ Supported by highly respected BRE
- ❖ Underpinned by good training and auditing methods
- ❖ Both fit well into sustainable construction objectives
- ❖ Can be progressively developed
- ❖ Are adaptable to regional policies
- ❖ Capable of contributing to SVC and resource productivity





Whole-system design

Design in Nature:

- it runs on sunlight;
- it uses only the energy it needs;
- it fits form to function;
- it recycles everything;
- it rewards cooperation;
- it banks on diversity;
- it demands local expertise;
- it curbs excesses from within;
- it taps the power of limits.

Biomimicry, Benyus,
2002



Whole-system design Assessment

DESIGN QUESTIONS

- Does it run on sunlight?
- Does it use only the energy it needs?
- Does it fit form to function?
- Does it recycle everything?
- Does it reward cooperation?
- Does it bank on diversity?
- Does it utilize local expertise?
- Does it curb excess from within?
- Does it tap the power of limits?
- Is it beautiful?



Is Whole-system design new?

“ Ask please the domestic animals and they will instruct you; also the winged creatures of the heavens, and they will tell you. Or show your concern for the earth, and it will instruct you; and the fishes of the sea will declare it to you.”

JOB 12:7,8. (Moses c1430 BCE)