

TITLE: HOW TO BUDGE 'BAU'? (BUILDING AS USUAL)

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Summary

The Building Industry is inexorably driven by profit motive and Building as Usual (BAU) is very difficult to change, due to deeply entrenched vested interests which are stubbornly inimical to any reform perceived to be a threat to those profits. A pragmatic question exists as to whether the global awareness of grave hazard to human habitat and reforming initiatives can in fact prevail over profit motive and short term-ism. This paper gives an account of how a small specialist dedicated ecotecture professional practice can make some progress across a wide spectrum in 'budging BAU' by:

- 1 . design of catalytic building projects ,
- 2 facilitating post occupancy evaluation of that completed work ,
- 3 collaboration in eco village development and urban planning zoning initiatives
- 4 contributing to institution building to counteract the prevailing negative trend
- 5 activism to assist governmental fiscal and other instruments to be devised and applied
- 6 occasional teaching
- 7 international think tank activity in GAIA International.

It is suggested that if these efforts are multiplied there is hope for the future.

1 Navan Credit Union; Eco Offices (2005); Post Occupancy Evaluation

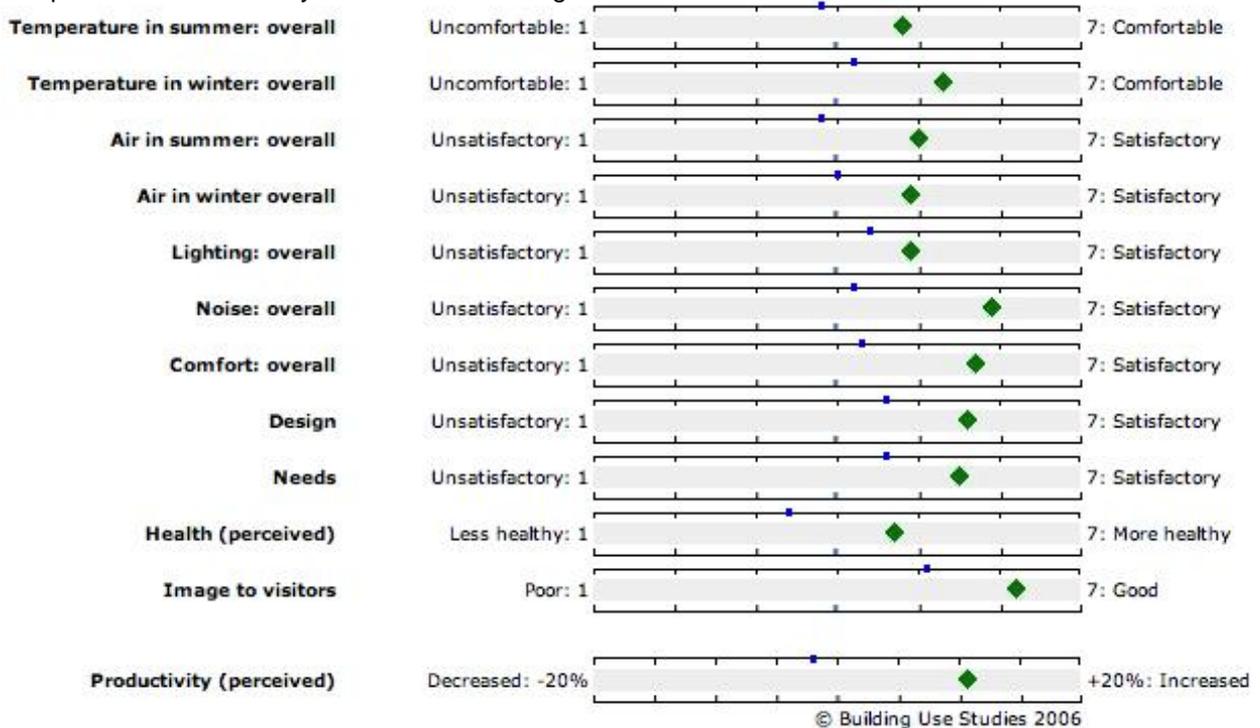
Detailed quantitative and graphic results from are shown below of several years of assessment, and iterative fine tuning, of a completed five storey eco office building, Navan Credit Union: See (www.constructireland.ie/articles/navan.php) and SB05 proceedings with many passive and low energy design features including:

Timber structure of five storeys

- Passive solar heating; strategic orientation / shading
- Passive cooling ventilation: high thermal mass undercroft
- Passive ventilation by Solar Chimney
- Rainwater management system
- *Baubiologie* building fabric, of clay timber cellulose etc
- Interior Planting for air quality management
- deciduous shading on pergola trellis work on SE and SW
- gas driven heat pumps / condensing boilers
- sedum and intensive grass roofs
- Interior passive natural ventilation, cellular and open plan while preserving acoustic privacy
- synergy with community support and help organisation
- Building Energy Management System controlling PV solar powered servos on many windows, vents, pumps, dampers, fans to optimise performance ; fine tuning of software in the light of several years of monitoring
- Active solar thermal hot water system
- Engineered solution to fire safety and evacuation
- long design life approach to exterior and rain screen elements of a building from organic materials, while minimising embodied energy ; the trade off required
- double façade and ventilation box windows .

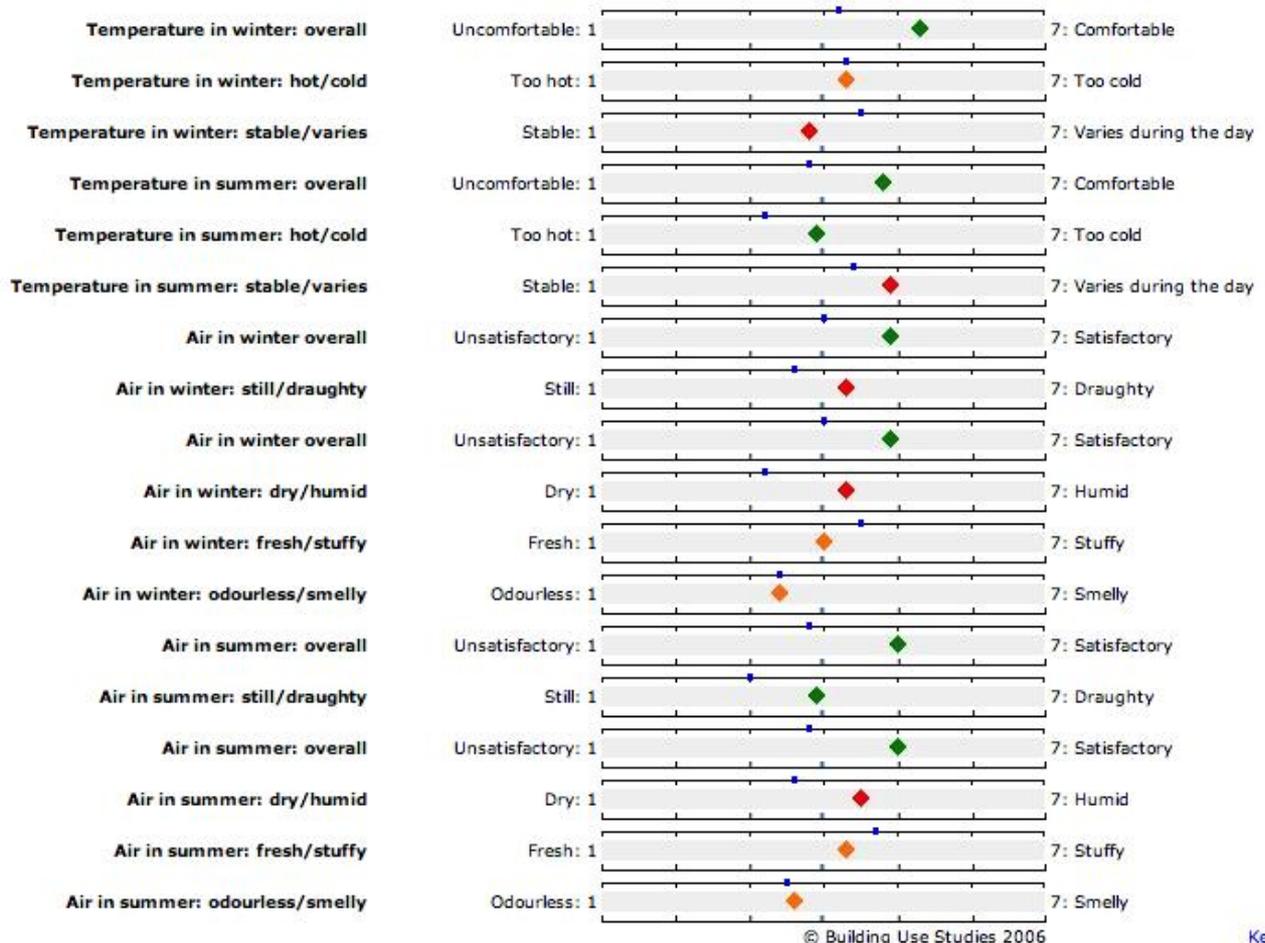


Independent evaluation by the Useable Buildings Trust is shown



These results based on independent interviews with the users of the building conducted by Prof George Baird and processed by Adrian Leamon are among the top 5% of all buildings surveyed by the <http://www.usablebuildings.co.uk>

More detailed analysis indicated perceived shortcomings, again using traffic signal colour codes, as follows on a 'warts n' all basis' :

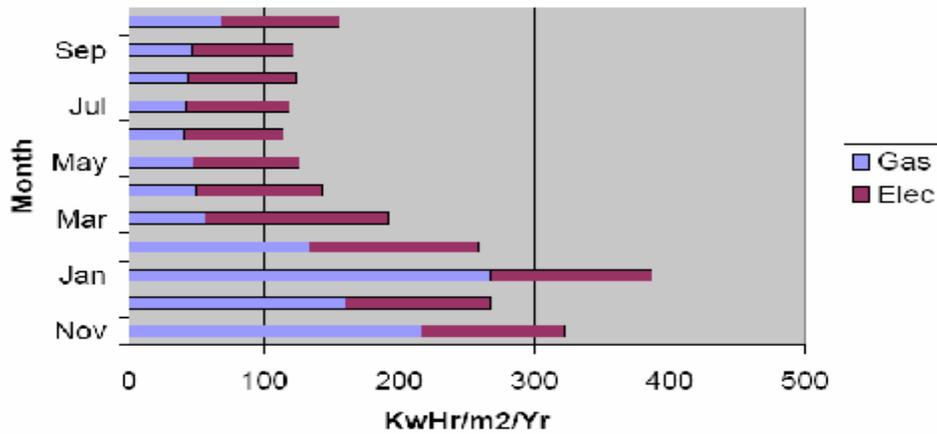


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Lessons learned from these user interviews have led to fine-tuning and remediation with a view to follow up interview where it is hoped even better results may be obtained.

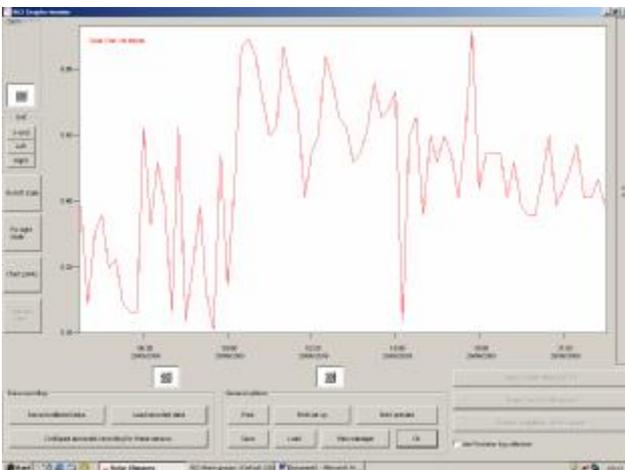
ENERGY USE is shown in reverse chronology –latest at top for Sept 07; as the building was in commission and test phase anomalously high figures were recorded; through a process of elimination energy inefficiencies continue to be eliminated; these include elimination of an air curtain at the main and busy entrance with a generous draught lobby with automatic doors: User behaviour in relation to use of heating ventilation and cooling.

Energy Usage



VENTILATION

Solar Chimney

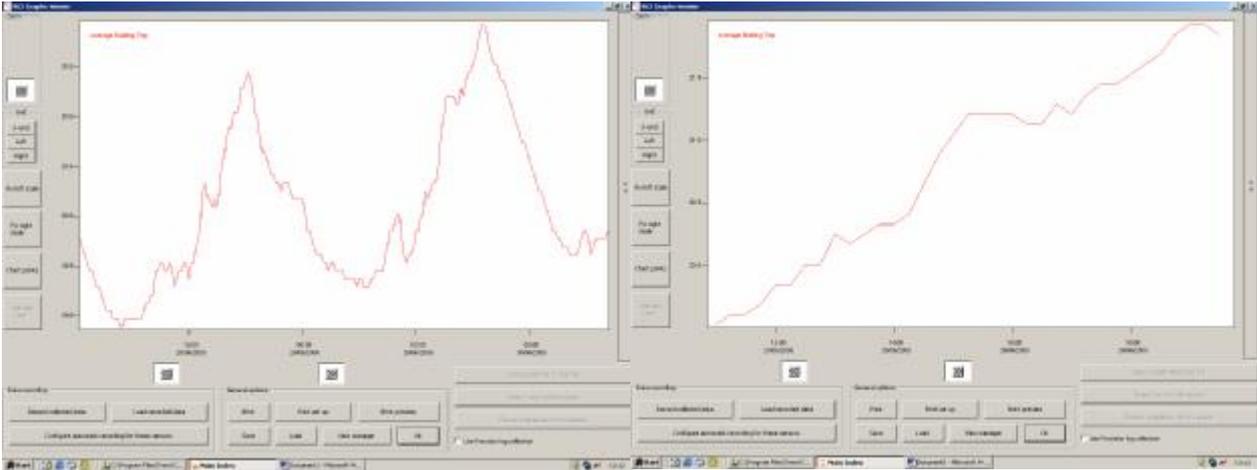


This simple device (seen centrally above right) at the top of the atrium has proved very successful, especially in fine tuning.

In deep Winter both the 'venturi' and solar chimney are closed down fully. In the shoulder seasons of Spring / Autumn this solar chimney is gradually utilised more or less as required and only in high Summer the Venturi ventilator (see below) is introduced.

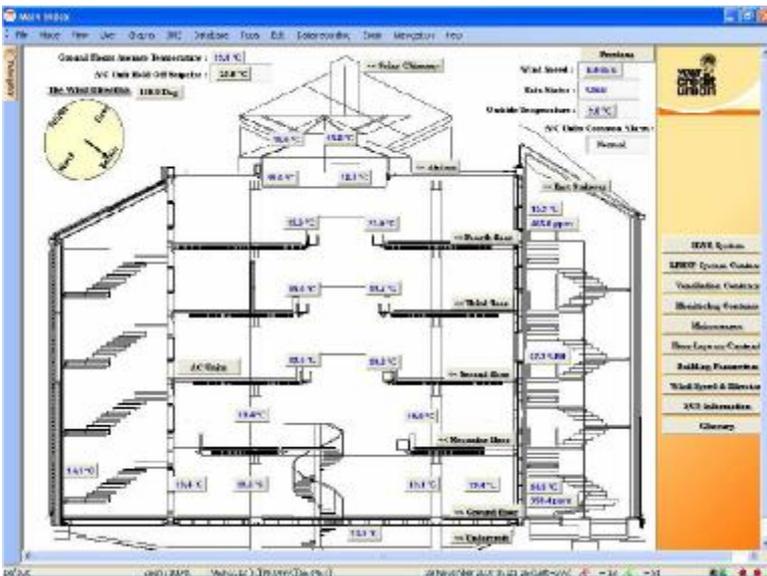
From this figure may be seen that velocities of 1 metre per second of free ventilation are achieved in sunlight / naturally in phase with requirement for enhanced ventilation. The consulting engineers have been agreeably surprised by volumes moved.

Temperature Control



The commonplace issue here is to control the afternoon 'spike' in temperature; the left hand shows temperature over two Summer days and the right a daily detail ; it may be seen that auxiliary cooling (gas heat pump) is utilised to delay the natural spike of temperature at 21.25 Deg C until after office hours when it is allowed to climb (when natural ventilation is closed down for security). One of the key issues is staff culture/ behaviour - opening a window is better than turning up cooling.

Conclusion

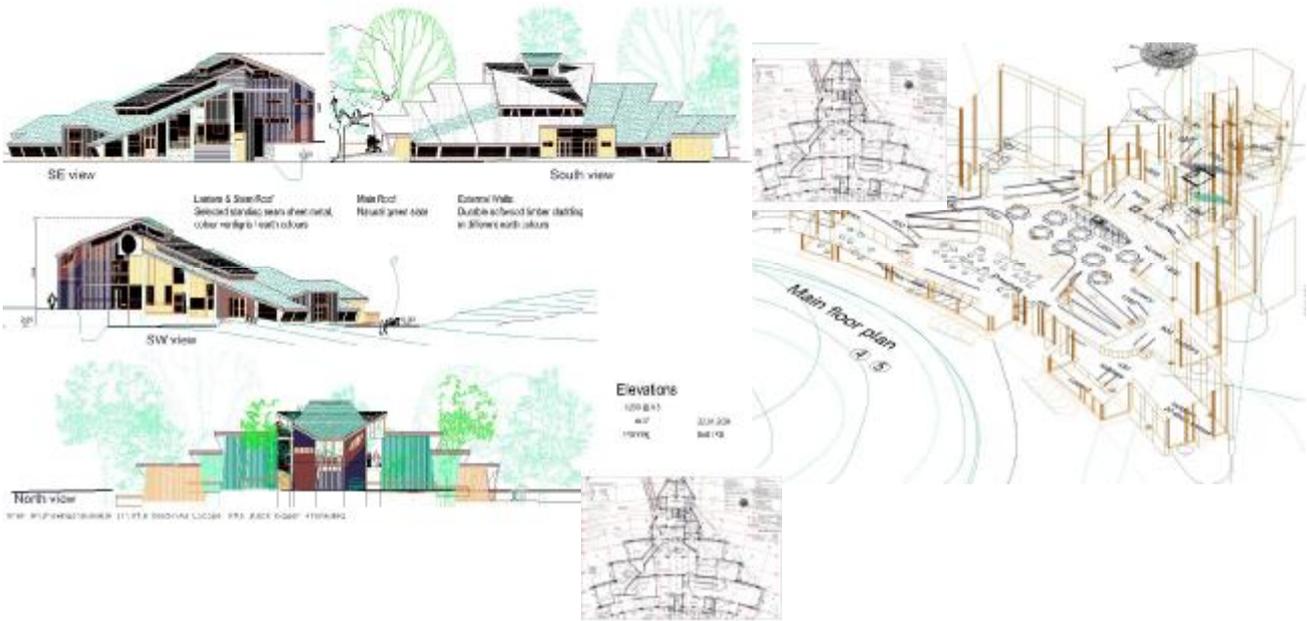


From these results and ongoing work it would appear that 100 KW hrs/Sq M /annum is an achievable target for an office building of this kind at this stage ; ie double the original target which is more appropriate to eco / quasi passive housing. Whereas the atrium design has genuine architectural benefits it contributes to stratification in the building leading to variations during the day ; cold at low level in winter mornings where sedentary workers start their working day . The 'cooling behaviour' of the occupants is cultured by their negative summer experiences of the high thermal mass original building; they are predisposed to the use of auxiliary cooling with inadequate resort to the passive features. The architect would prefer not to install auxiliary cooling at all in this temperate climate. The parallax between design intentions and experienced outcome informs continuing design development in this field.

2 Third Level Campus Creche; Dundalk Institute of Technology



This new design is ready to build on site and awaits funding. Many of the features of the Navan project are reinterpreted here. An essential, point here is form language; an organic building which aims through form, scale, colour, texture, natural light, and ventilation to enhance the earliest years of education of preschool children; the facility itself has a high environmental pedagogical intent re flows of water light waste air etc. In many respects it brings the thinking of High Scope, Montessori, Froebel, Steiner/Waldorf into the 21st century ethos of survival the new generations, through care for our human habitat and that of other species.



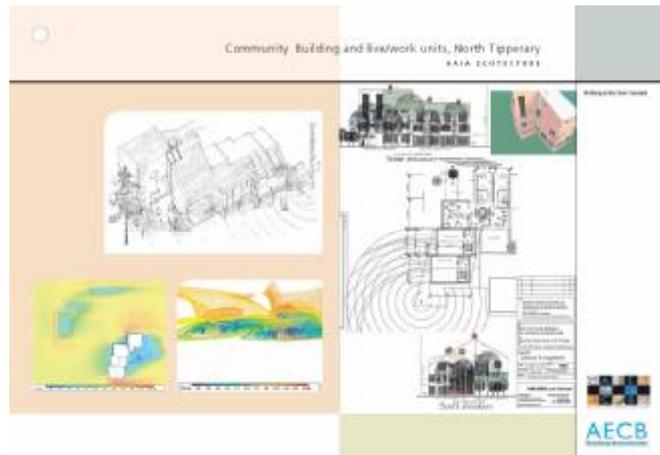
3 Collaboration in eco village development and urban planning zoning initiatives

Two examples will be discussed; The Village Project, Cloughjordan , Tipperary and Laytown Eco Residential Business Zoning.

3.1 The Village Cloughjordan www.thevillage.ie

One of our principals is a member of the eco village and the Planning Group therein.

We are also designing a community building and some live-work units at the core of the site along with a further Cluster 9 of the development. The project is 'budging BAU' as it has become a point of reference for development in the whole country. Infrastructure is now complete and the first roll out of the clusters is just beginning.



3.2 Laytown Eco Residential Business Zoning

This study was undertaken for the landowner of 75 Hectares on the main rail line in the country, on the Belfast Dublin axis. It resulted in the formal adoption by the Planning Authority of an innovative Eco residential business zoning. The principles followed were of those of systems theory ; a tolerance of a certain degree of democratic free market 'chaos' while introducing attractors , being an urban civic space and balancing lake water body ; one hard edged urban, one soft-edged natural.

As an essay in stochastic planning, the out-turn is, as yet, unclear as to how it will affect the market place; as in all 'budging bau' the impulse is sent into the system in the hope that good will come of it of but short of eco fascism one must wait and see how our free society is affected .

Three dimensional mixed use live work development is envisaged.



4 /5 Counterculture institutions to BAU with access to Government at Highest Levels.

In the centre of Dublin a multi faceted sustainability Institution has slowly grown due to the work of a committed team; see www.cultivate.ie **éasca** has also been founded by the author and others to attempt to shift the sector toward sustainability; the word in Gaelic means 'easy' and the acronym is the Ecological and Sustainable Construction Association. We are subtly engaging vested interests; upstaging those who just greenwash Building As Usual (BAU). See www.easca.ie. **éasca** is often hosted by Cultivate and the offices and staff of **éasca** are shared at Cultivate for synergy and efficiency, in Temple Bar, at the cultural heart of Dublin , the capital city. (Temple Bar itself as an urban quarter has an inspiring history as an urban renewal cell and much of what was learned there is being replicated throughout the city.) **éasca** now has a burgeoning membership with many partners from the sector signing up to a subscription based on turnover and assisting the organization to make a difference. The Green Party after a dramatic walk out, recently managed to secure three Government Ministries: Environment, Heritage and Local Government: Energy and Communications: Food. The synergy between these Ministers and **éasca** / Cultivate is promising. An advisory committee to the Minister has been formed which sits in his office. A number of initiatives are in hand including a revision of the Building Regulations to effect a 40% improvement in primary energy usage compared with a conventional base case. It remains to be seen what possible effect is possible within a Government still very committed overall to BAU, with ministries such as Finance still in the control of the majority centre right party who have just started addressing the issues as financial penalties are brought to bear under EU and Kyoto measures.

6 Teaching

Occasional teaching as guest lecturer allows one to budge BAU by facilitating the new generation of architects and allied professions; it is noticeable how Staff have now become interested; a recent lecture to second year students attracted the attendance of ten staff from several years and a lively discussion followed; one has the sense that things are changing and perhaps a green chain reaction is possible?

7 International think-tank activity in GAIA International

GAIA International was founded in 1990. It is a non corporate informal structure of disparate but like-minded professionals in practice, research, teaching, writing and publishing who by contact from time to time enable and sustain and encourage each others work .It budes BAU in subtle and sometimes overt ways. GAIA International stands for the balance and integration of the built environment with ecosystems for the welfare of all species on the planet.