NDY has applied the NABERS methodology in Ireland at 25 North Wall Quay (NWQ), Dublin, in partnership with IPUT Real Estate.
(Photo courtesy of IPUT Real Estate Dublin).

On the road to Net Zero Carbon … everybody needs good NABERS

As an Irish engineer who spent over six years living in Australia and became a dual citizen, I have an appreciation of what both nations do well and areas where we could improve collaboration. For example, as a Waterford native, I strongly believe that the "Waterford Blaa" would be an excellent addition to an Australian barbecue. However, when it comes to reducing energy in the built environment, I have to concede that the Aussies got it right, and a long time ago too. With coal being a dominant fuel for power, they simply had to. Mike Arnold, Director – Ireland, NDY (pictured) explains.

The same can be said for the National Australian Build Environment Rating System, or NABERS, as it is better known. It is pronounced Neighbours, but has no relation to the Australian TV soap opera. NDY originated in Australia and was a founding signatory on the NABERS program in 2001. NABERS was introduced to the UK in late 2020 and NABERS ratings can now be officially certified there. While the certificate is valuable, it is within the methodology and associated energy savings where the real value can be uncovered. See Figure 1.

The background

Within the building sector there are many ratings tools for developers, landlords and tenants to choose from – each aimed at delivering on aspirations

Context

My overarching goal in writing this article was to provide joined up thinking on the next steps for a low carbon future. While my background is in mechanical engineering, most of my career has been spent leading projects that include multiple engineering disciplines such as electrical, sustainability and digital buildings. I have led teams as a consultant, a contractor and a client. I have also led teams that include accountants.

This article is about engineering and accounting and where the two can, and must, come together. The content includes contributions from colleagues in Ireland, the UK and Australia.

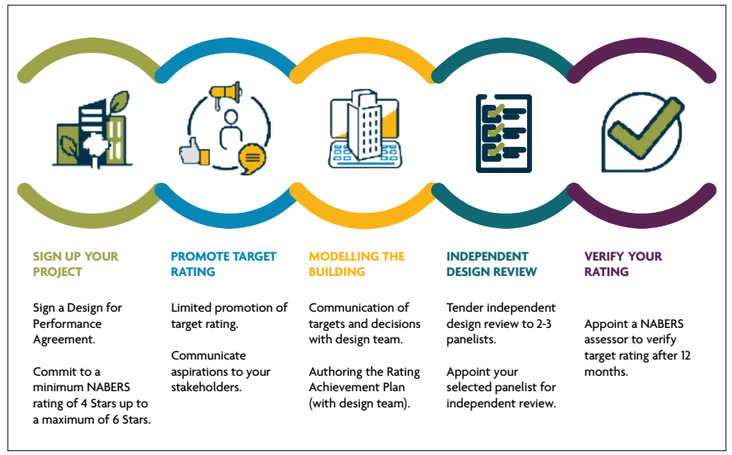

Figure 1: The NABERS Design for Performance Process.

for buildings to minimise their environmental impact and/or improve the occupant experience. These include WELL, LEED, BREEAM, BER, EPC, CIBSE TM54, NZEB, Wired Score to name but a few. The WELL Building Standard focuses attention on the occupants and enhancing health and wellbeing through design and policy interventions. Wired Score focusses on the connectivity of a building. LEED, BREEAM, BER, EPC, CIBSE TM54 and NZEB include energy modelling of a building and require designers to think about how the building can reduce its carbon footprint.

Designing for compliance to achieve these ratings will positively impact the carbon footprint. These models can also be updated when a building commences operation to represent "as built" conditions and to extract monthly energy performance targets to assist with ongoing tuning.

Modelling is, however, an abstraction of reality and will almost never accurately represent operations. Assumptions around occupancy numbers, hours of operation, loads, etc will all change as a building is utilised.

Looking forward

To shift thinking from "designing for compliance", to "designing for performance" requires energy accounting on projects and a better understanding of the actual operation of buildings. It also requires an understanding of what a landlord controls, what tenants can control, and how the two inter-relate. This could manifest in landlords aiding tenants to reduce energy consumption and fine-tuning landlord systems to make them as energy efficient as possible.

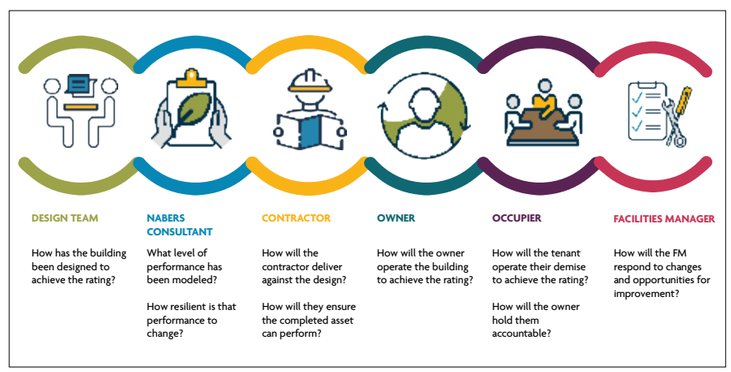

Figure 2: Roles and responsibilities in the NABERS rating achievement plan.

If the goal is to reduce energy, like any goal, it must be measurable. Firstly, a building must have the ability to measure how much energy it is using and where it is using it – this can be achieved with a good metering strategy such as CIBSE TM39. Metering systems can vary significantly from building to building, depending on the design priorities, building age and level of investment. NABERS facilitates a more consistent approach to this.

Secondly, a monitoring strategy must be in place with the ability to produce accurate and trending data so that the biggest energy consumers can be identified. Most building management systems (BMS) can do this. Like metering, however, the building parameters that the BMS monitors varies significantly from building to building. A BMS alone will not reduce energy consumption and still requires a building operator.

So thirdly, there must be a method of analysing data so that it can provide the building operator with meaningful suggestions for improvement. A smart energy and building analytics system can help identify areas of savings and prioritise them based on potential impact. One example may be systems running outside of occupied hours. The analytics system will detect the potential fault, analyse the cost impact of the fault, and alert the operator to intervene. Configuring analytics in the form of potential cost expenditure or saving provides extra incentive for action.

Additionally, when coupled with occupancy-based detection, the system can alert to potential areas of discomfort for occupants. The next step here is for the building to utilise artificial intelligence (AI) to undertake this tuning without intervention.

Finally, there must be a commitment to ongoing energy management for both the base building and tenants. This commitment needs to be monitored consistently across multiple buildings and, to truly be effective, must have an auditable trail. The NABERS energy rating tool can provide this level of verification. In order to achieve high ratings, a continual commitment to gathering and benchmarking data is required. See Figure 2.

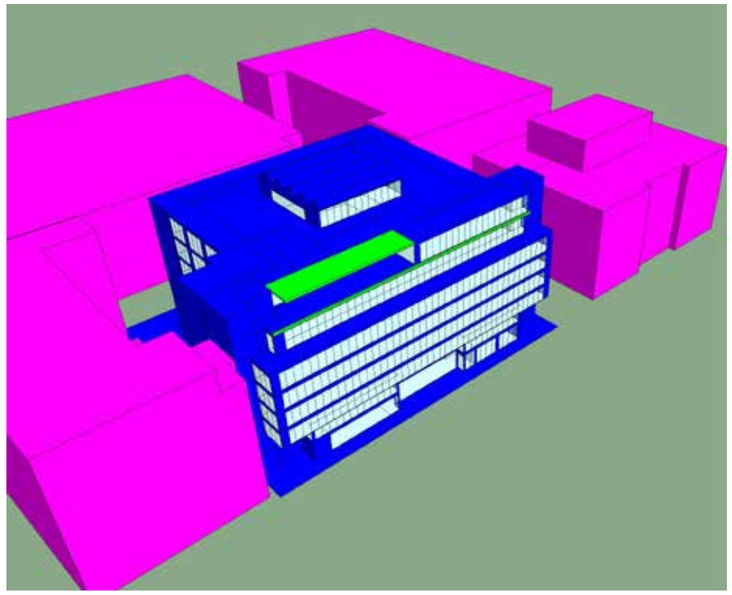

Figure 3: Energy Model for 25 North Wall Quay.

A smart building can work hand in hand with NABERS. Building operators and tenants are given access to an analytics portal which can reveal areas for improvement in real financial terms. This innovation provides transparency of building and tenancy operations to those paying the bills, thus providing further incentive to reduce energy use and thereby improve the NABERS energy rating.

NDY has already applied the NABERS methodology in Ireland at 25 North Wall Quay (NWQ), Dublin, in partnership with IPUT Real Estate. If the NABERS methodology was applicable here in Ireland, the building would have the potential to achieve a NABERS design for performance rating of "excellent" (five stars).

NDY's involvement at 25 NWQ also included the smart building design. Our team collaborated with the wider building design team to produce a detailed operational energy model of the building and supported IPUT in the authoring of their rating achievement plan. This allows both developer and tenant to coordinate efforts to ensure efficient performance in use and to maximise the features of the smart technology integrated into the design. See Figures 3 and 4.

> *If the goal is to reduce energy, like any goal, it must be measurable.*

Implementation of NABERS requires considerable sustainability and engineering effort and the capability to deliver excellent results. It requires a commitment to design a building for performance. The methodology offers a more integrated approach to sustainability and engineering that can be administered at any point in a building's lifespan.

Since inception, the NABERS government website notes savings of 11 million tonnes of carbon emissions and 1.7 billion dollars in energy bill reductions. Personally, I have seen existing buildings achieve energy reductions of over 30% by lifting their NABERS rating by a single star. The essential need to reduce carbon and arrest the climate crisis is becoming more urgent and Irish businesses should not wait for legislation before acting as designers and influencers of the built environment.

For more information on NABERS contact Mike Arnold, Director – Ireland NDY. E: m.arnold@ndy.com

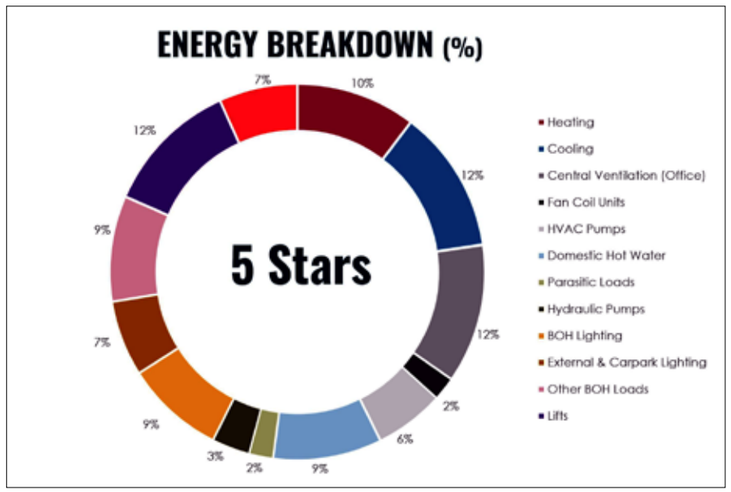

Figure 4: Energy Breakdown at 25 North Wall Quay.