Maximising the benefits of green building while reducing the risk and cost of green building certifications

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ABSTRACT: Green buildings present new challenges for owners developers: In addition to rapidly evolving accreditation criteria, environmental performance depends heavily on local context and the interaction of the different elements of the buildings. Developers can tap on their experience implementing quality to some extend only. To harvest the benefits of green buildings while reducing the risks and cost requires an integrated approach.

Too often a pure criterion by criterion approach leads to a collection of costly independent green features. To be successful the integrated approach must start early and rely on design to provide mutually supportive solutions. This requires in turn clear prioritization which can be achieved through well defined operational objectives and also an integrated project organization. Green buildings are attractive to the majority of buyers in our region too and can command a price premium. This can benefit directly the bottom line when risks and cost can be controlled effectively. The experience accumulated in more mature markets demonstrates that marketing the benefits of green is critical to harvest the full potential of green buildings.

Case studies of few buildings in Singapore or Malaysia where the temperate weather, high energy air conditioning usage and water been the main focus in building the green landscape. Singapore is named the greenest city in Asia by Siemen's Asian Green City Index 2011.

The paper will also present case study of Ministry of Energy and water (EWURA), in setting baseline of Energy consumption in Tanzania. The project is in the process of obtaining Green Building Certification.

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INTRODUCTION

Green building accreditation schemes offer recognition to buildings for their environmental achievements. Nevertheless, Building Owners remain confronted with the difficult task of determining which green features to integrate or not in their projects, how to communicate them and achieve maximum impact while limiting risk and cost.

The large diversity of technical elements involved in the greening of a new or existing project is challenging in its own right. But this difficulty has been faced since the beginning by developers who must already use the services of many specialists like architects, M&E engineers, quantity surveyors, landscape consultants etc.

Facing the multiple requirements stated in the green building accreditation schemes, developers could be tempted to ask their different service providers to "just" meet them. But environmental performance is influenced by more than one element. Integrating complementary solutions becomes critical to avoid facing an addition of costly green features because they are considered independently from each other.

What makes the greening of buildings even more difficult to achieve is that performance is often driven by the context of the development, notably climate patterns and site location. The creation of standardized solutions and best practices becomes therefore more difficult when every new project is heavily influenced by its local surroundings.

The rapid evolution of green building accreditation scheme represents also another issue for developers: today's green buildings might not be able to meet tomorrow standards. The potential threat for the reputation of the developer is not to be underestimated as the resale value of developments is critical for investors / buyers and will depend more and more on green accreditation awards.

1. A FIRST APPROACH FOR BUILDING OWNERS: ADAPTING QUALITY APPROACH TO GREEN

One natural avenue building owners can explore to harvest the benefits of green while reducing risk and cost, is to follow the same approach as when they adopted Quality standards.

The introduction of quality management systems helped building owners demonstrate their commitment to provide quality buildings. Green building accreditation schemes provide buyers, investors, tenants as well as the general public and officials with the same proof that developers have integrated environmental requirements in their buildings.

In fact, quality introduction and greening of buildings share a lot in common:

Like quality, green touches all the aspects of a development, from marketing to construction;

Like quality, green must address the source of non-sustainable / non-environmental practices

Like quality, green must be addressed by all the construction value chain to be effective

Like quality, green has its own ISO standards (14000 vs. 9000)

Like quality, it takes times to get an effective green culture in place

Like quality, green can command a premium

Like quality, green can be achieved successfully while limiting costs and risks at the same time

Like quality, green can represent a serious competitive advantage for the developers.

As with quality, developers should approach greening of building in a staged approach to maximize the chances of success:

1. Start. Use a pilot project to explore the potential of greening buildings through a concrete example. This should be use to look at design, contracting, tax, cost, marketability and organizational issues to define priorities based on the identified benefits and challenges. Due to limited past experience, the obvious choice for developers is to rely on external experts to drive and support the initiative. They shouldn't forget to involve their own employees and business partners so the experience is not lost to the organization.

2. Systematize. Adapt methodologies to your own organizational context to match ambitions and means and develop both a roadmap for the greening of buildings and of your organization. Measure, learn and correct continuously, starting from your pilot project. The deliverables should include at least the adaptation of existing processes, the creation of new roles and responsibilities throughout the organization.

Unfortunately, replicating the quality approach and its tools alone is not sufficient: design is critical to the success of a green building and it requires an integrated approach to enable effective and efficient greening of a development project. The reasons will be explained in the following paragraphs.

2. INTEGRATED APPROACH TO GREEN BUILDINGS

2.1 Case for integrated approach

Environmental performance depends by nature on the local context of the development. Among other things, the site will present both challenges and opportunities when it comes to green building accreditation. If your development is in the middle of the city, your options for façade orientation might be severely limited. On the other hand, the connectivity to public transport, availability of amenities and the potential reuse of existing structures all represent opportunities to limit the impact on environment.

As mentioned, an integrated approach goes beyond the construction phase: site selection, marketing and financing can and should all be included in the scope of the Green approach to harvest benefits while reducing risks and costs for the developers.

Let's look at this example built on public data from US Green Building Council (US GBC). Both developments are high-end hotels with relatively comparable set-up except maybe for gross floor area. A critical element explaining the difference can be attributed to the site section of the scoring. With proper selection of the location (or sheer luck), the first hotel scores almost maximum point, enabling it to achieve Platinum status while the second one is handicapped by its low score. Such contextual elements can easily contribute to explain why the Platinum hotel has a cost per square feet only half of the Certified-only hotel.

Figure 1: Illustration of site selection on accreditation level and cost

2.2 Case for integrated design

While Green building dependency on local context justifies an integrated approach, it goes beyond the integration of green constrains, elements or features at each phase of the development. Design plays a key role in the capacity for a development to perform according to the environmental standards set by green building accreditation schemes.

If material selection contributes significantly to the final performance, integrated design approach enable a cost efficient greening of buildings. The complementary nature of the solutions used explains the cost efficiency of integrated design: trade-offs are made at early stages, with an emphasis on looking for *mutually supportive solutions*.

Green building accreditation schemes emphasizes the need for an integrated, holistic approach. Yet, the very nature of the scoring system tends to push for a criterion-by-criterion approach. This often results in a laundry-list type of green features, adding up to the general cost of the construction. How many times are water chilling systems designed based on average values without taking into account the improved thermal performance of the building envelope?

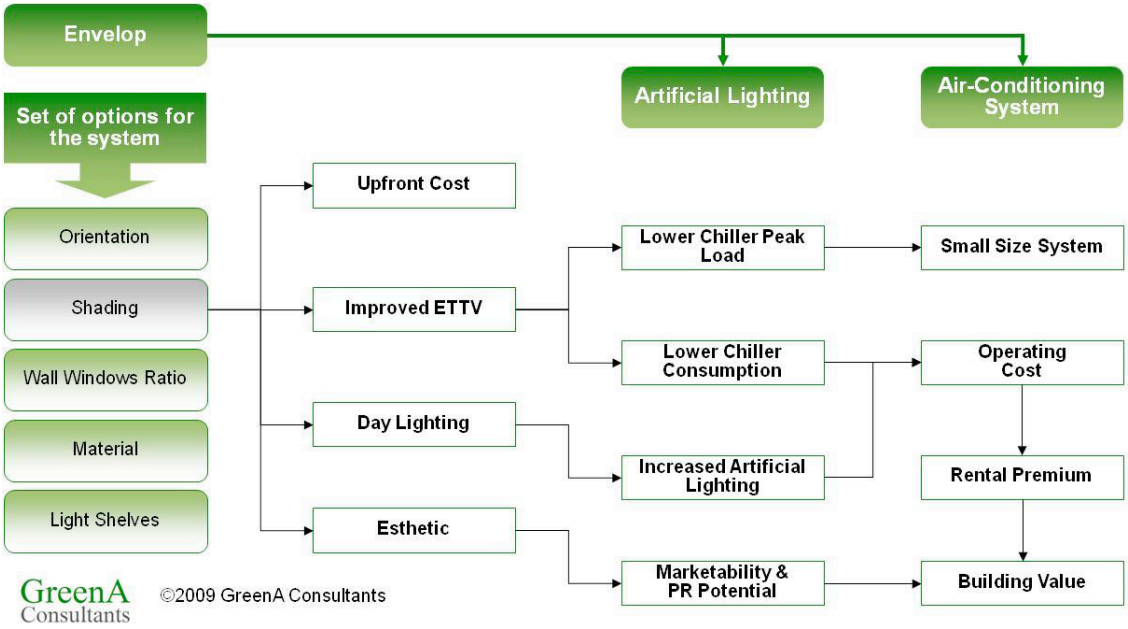

Figure 2: Integrated design review process – example

2.3 Objective-driven design and approach

Most traditional buildings already integrate what we consider green features. In our tropical countries this often involved improving thermal performance when there was no air conditioning system to rely upon. Green building accreditation scheme are not new neither, starting as early as 1990 in UK BREEAM and 2000 in US LEED.

On the other hand, local standards adapted to the specific conditions of our tropical countries like Green Mark of Singapore (2005) are relatively new. Nevertheless, media exposure, governmental incentives, building owners vision and values have prompted a strong interest.

The difficulties start with the translation of green ambitions into a concrete action plan with cost and risk control. More often than not, the scope and objectives are not clearly established and the green dimension is considered as an add-on on an already planned project. As we argue in our section about copying the Quality approach, using a project as a pilot represents a sensible solution. The real root of the problem is the lack of clearly defined objectives for this pilot other than achieving accreditation, and ideally being the first to do so in your region.

Talking about a performance-driven approach is meaningless without clearly defined objectives. Business benefits associated to green buildings are not limited to energy savings, reputation and marketability. Without a clearly defined set of prioritized objectives, any trade-off to be made during the project will often be made based on available measures: direct cost of the feature without looking at the overall impact on the project, or simply the first available solution.

One should therefore start developing a set of overall business objectives, prioritize them and iteratively translate them into operational objectives. Then only the classical performance-driven tools can apply. This is even more critical in our region where green building accreditations are relatively new and where the understanding of the potential benefits, costs and risks remains relatively limited.

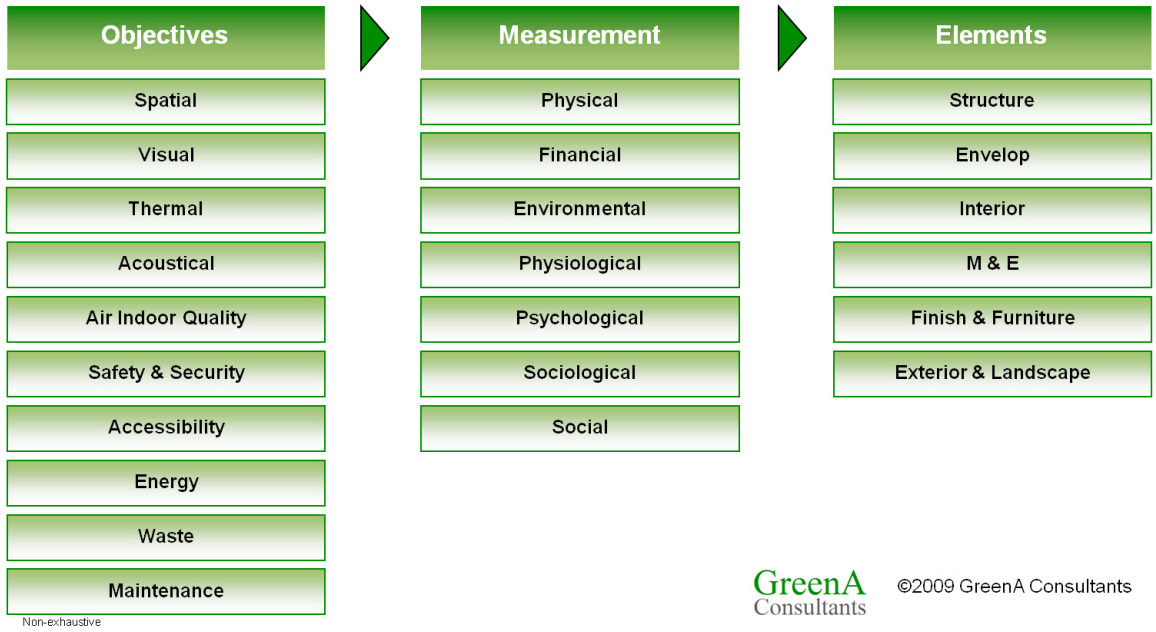

Figure 3: Illustration of operational objectives definition and translation in measurements and actions

2.4 Integrated organization

Construction work often involves multiple specialized interventions which can be executed sequentially. This lead to the current classical organization which involves multiple layers of business partners, with different if not conflicting own interest. Green buildings on the other hand require an integrated approach. While the scope of responsibilities and the line of command can (and in fact should) remain the same, there is a need to involve all parties from day one. The nature, scope and intensity of the coordination effort all depend obviously on the organization and the project itself.

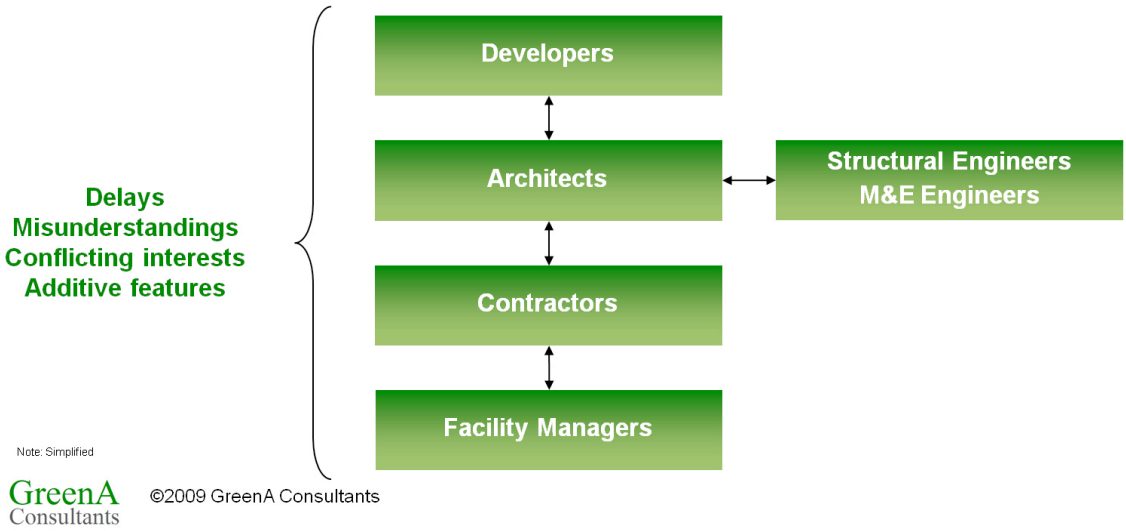

Figure 4: Conventional organization and key resulting issues

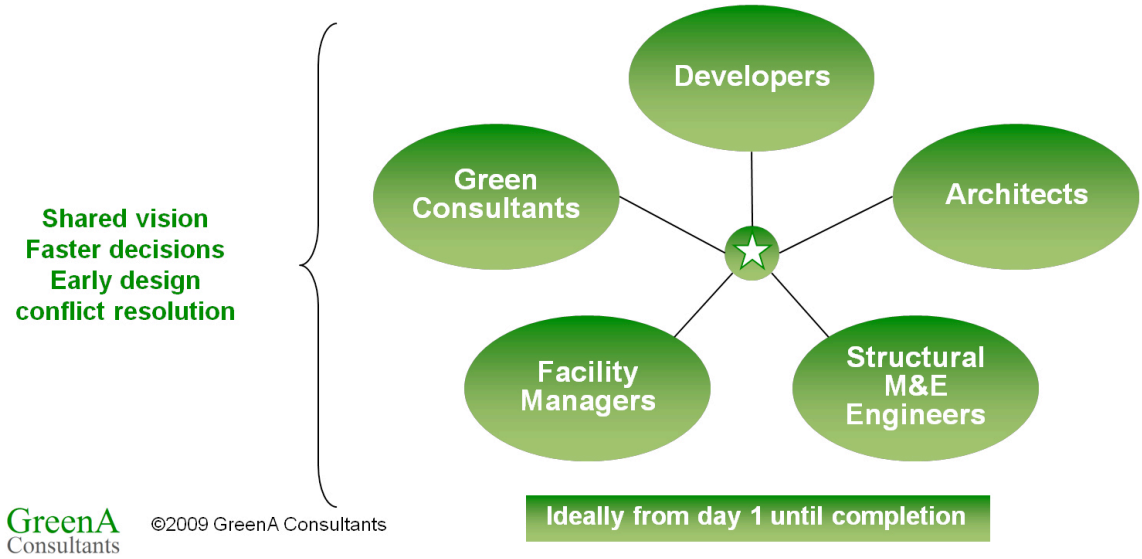

Figure 5: Project organization adapted to green building

Interestingly enough, experience tends to demonstrate that such organization benefits the entire development rather than just its green part. While it demands a slightly higher up-front investment, in the end, this can reduce the cost dramatically as issues can be solved early when the cost is not too high. More often than not, final users like facility managers or residential dweller (in focus groups) also tend to be forgotten and the organization will prioritize its own constraints. This leaves the success of a development to the experience or sometimes sheer luck. On the other side, there is clearly the potential to build a sustainable advantage and improve the marketability and profitability of projects in a systematic manner.

3.5 Green benefits for building owners

Armed with clearly defined objectives, a collaborative organization and the right tools to make the trade- offs from design stage, developers can effectively reduce their costs and risks in achieving their green building accreditation. While it is easy to understand why the focus during the early stages remains largely on risks and costs, one should not forget the benefit side of the equation which justifies the efforts.

Green accreditation provides the proof that developers have dedicated efforts and resources to meet environmental standards and most importantly that performance of their buildings meets certain thresholds. This is becoming increasingly important in a world where radical greening, the act of which potentially narrows the threat gap between sustainability and business landscape is perceived as one of the top 5 risks for global business: green accreditations can be perceived as insurance in-kind for developers.

While green accreditation is powerful in its own right, developers need to go beyond one additional logo on their brochure if they want to extract the maximum benefits. Again, like quality, only benefits for the buyer matter.

Effective marketing of green buildings will play on the benefits of green for their target audiences. Comfort and environmentally friendly features are not irreconcilable: Increasing natural lighting has been proven to increase productivity and help fast healing for example. One needs only to look at more mature markets like the US where a green hotel chain was launched but emphasis was on the benefits of green and not the accreditation itself.

Figure 6: Illustration of advertising green benefits rather than accreditation

CONCLUSION

Many Building Owners can achieve the benefits of green building accreditation for their projects while limiting cost and risk if they adopt an integrated approach. This approach relies on clearly defined objectives to enable effective trade-offs, ideally as early as possible (including site selection), in particular at design stage.

Building the capacities to meet green building challenges takes time as the all value chain needs to adapt. Green building accreditation schemes being relatively new in our region, there is a clear first mover advantage to be exploited, at least in terms of marketing. More importantly, green building accreditations tend to become de facto standards of the market (US) or even integrated in the building code eventually (Singapore), so the earlier building owners can adopt them, the better they will be.

Case Study of Green Building in Tanzania - EWURA
While deciding on which certification to go for, many elements come into play;

- Climate & Infrastructure
- Relevant Governmental codes – if any
- Sources of material construction
- Technical challenges
- Incremental Cost
- Objective of certification

All the above will be address in the case study workshop

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