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Why Sustainability is Today a Key Success Factor in the Delivery of Large, Complex Projects

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Large development projects are increasingly facing pressures to meet the demand in developing extremely complex infrastructures while also looking into limiting environmental impacts and implementing long term strategies in line with sustainable development goals. The nature of such projects requires a customised approach and methodologies to ensure a successful outcome. Taking into account sustainability through all stages of project development, from initial study to commissioning, is today a key factor for project success and can even lead to enhance the overall return on investment.

Large Complex Projects and Sustainability

What is a large complex project (LCP)?

While a multitude of construction projects are taking place around the world at any given time, a handful of them are large and complex in nature. Typically large complex projects would be defined as operating on very significant budgets (not uncommonly in the USD billion dollar range), large in scale, technologically and logistically challenging. Projects falling under this category may include large bridges, tunnels, energy power plants, petrochemical infrastructures, railways, mining sites, piping installations, roads...or as a matter of fact any other projects which are large scale and complex in nature.

The impacts of LCP's

Due to the nature of these projects which by definition are large, their environmental and social impacts are often very significant compared with other types of development projects.

The other particularity of LCP's is their uniqueness. Indeed LCP's are rarely conventional in nature but on the contrary push the limits of what modern development technology can do. With innovation also come new challenges both from a technical but also from an environmental and societal impacts point of view.

While the impacts can be very different in nature depending on the projects (thus a need for a customized approach), typical similarities would include: significant biodiversity and ecosystems impacts especially in remote locations, potential for strong chemical pollutions of various sorts which require risk management, significant atmospheric emissions both at the development and operational level, large scale social impacts which can affect entire communities, ground disruptions both physical and chemical in nature, noise disturbances, water quality degradation...and often a combination of these or more.

How to shift from a conventional defensive position to a proactive position on sustainability

Conventional HSE is a component of sustainability but is not enough

Many projects tend to combine sustainability and environmental affairs under the HSE (Health and Safety) agenda; this is not necessarily the best approach to have especially with LCP's.

Indeed HSE should actually fall under the broader sustainability agenda to address shorter term issues but should not be limited to this as sustainability is much broader and has a longer term view of the project. HSE is however an important part of the sustainability plan and to a projects success because it can act as the first strategy to address environmental and social impacts while at the same time addressing safety issues which often are directly linked to environmental affairs as well.

From a safety point of view, as LCP's often deal with heavy machineries but also harsh working conditions (e.g. tunnelling) safety on sites need to be managed with a different approach than conventional projects. Because LCP's are often unique and challenging, conventional HSE practices are not always adequate and a more customized approach is required. An initial risk assessment in order to set up specific standard operation procedures (SOP's) that will facilitate a smooth and safe workplace during the project development is a must rather than relying on pre-existing standards which will miss out on key risk elements.

Customization is a critical success factor on LCP's – in HSE like in many other aspects.

The reactive approach: dealing with peer pressures

While projects developers are becoming increasingly aware of environmental issues, it is clearly not the main motivation neither the reason behind the need of incorporating environmental and sustainability goals within LCP's developments.

The reality is that there are more and more pressures put on developers of LCP's to incorporate a sustainability/environmental strategy starting at a very early stage of the development process. These pressures

originate from various sources ranging from governments, the community, NGO's investors and other stakeholders.

Because of their nature, LCP's are also the centre of attention taking into account their benefits but also negative aspects implied. Indeed when an environmental incident (even of small scale) involves a LCP it is definitely not unaccounted for. The development of these type of projects are closely monitored not just by the developers themselves but also by governments, stakeholders, the media, NGO's and the world community which have interest because such projects are large and innovative in nature.

Because of this level of attention any incident could jeopardise the entire operations and reputation of the project (or the

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company behind the project). For this reason more than with any other projects type, the environmental record of LCP's should be flawless and this requires a specific and customised strategy as well as constant monitoring.

The hidden opportunity of sustainability: reducing cost

While LCP's operate on huge budgets it does not mean that it is limitless. In fact often, and like in any other projects, the budget is very tight and requires constant planning and adjustments to be able to complete within the given financial range.

Looking into sustainability measures at an early stage can significantly reduce the cost of a given project. Areas of immediate return include energy and water usage which in the context of LCP's can be very significant both during and post construction. A sustainability customized approach can reduce to great extents the expenses on energy and water consumption. Material usage optimization is another area that if planned appropriately can significantly reduce the cost of a project. Indeed, the amount of materials (metals, glass, aggregates...) used in this type of project is enormous and their cost represents a high percentage of the entire project. Optimization can be achieved through measures such as initial planning (including sustainable design) to collection and recycling of spare items. On a LCP the amounts of money that can be generated through the trade of unused or spared items is remarkable.

Transportation optimisation through an initial customized logistical plan can further improve cost reduction as the expenses in transportation for this type of projects is also very large.

Another noteworthy particularity of LCP's is that they often take place in remote locations which can be in unsettled areas, away from cities or communities. The reason for this is either because the large scale of the projects requires a large land space, for safety aspects, but also for obvious geological reasons especially when it comes to mining projects. This remoteness also means that LCP's are a target for renewable energies applications since often connecting to the grid can be more expensive.

Reducing cost through sustainability measures helps to relieve financial pressures during construction but also the operational cost of these structures in the long term.

Setting a new benchmark for sustainability in projects

Sustainability as a showcase

If a mega project is successful at implementing a sustainable development strategy, it has a unique potential to lead the way by setting the benchmark in a given industry sector and inspire many other projects of smaller and similar sizes.

It is not uncommon for LCP's to become landmarks in a given location which can be at a city or even country level. Examples would include the world's tallest buildings, mega tunnel structures or bridges.

Once a landmark, the level of international attention that these projects have is tremendous which also means that such projects are in a unique position to showcase leading examples of sustainability and that the case studies will be setting the benchmark for others to follow.

Adding real value to the projects

Such level of exposure in today's international political climate dominated by environmental and social challenges and dilemma is a great added value to any given project.

Added value is not just about giving the project or the people behind it a good conscience but more about adding value to the shareholders. Who would want to invest in projects which have a name synonymous with environmental degradation these days? It is a financial risk that most investors are becoming increasingly very cautious about.

A final word

Large Complex projects need to become more receptive to incorporating a sustainability approach within their core development strategy. It is not just a defensive stance to respond to mounting pressures from the stakeholders. There are huge opportunities to drive sustainability as an agenda that makes financial sense in the short (project construction) and long term (facility operation). Sustainability is becoming a critical factor in a projects success. Too many infrastructure organizations do not recognize this aspect and this creates today significant project failures. Taking into account sustainability from the onset is today a must for organizations involved in Large, Complex Projects.

Sylvain Richer de Forges is an environmental scientist and a corporate sustainability specialist. Over the past years he has been mostly working in Asia on the development of environmental programs with public and private sectors. He is the author of a published book on sustainable development: "The Diversity of Life on Earth". Elements of his work have been key in obtaining some of the highest corporate environmental awards in Asia including the ASEAN Business Award and the Singapore President's Award for the Environment.



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