

Is lean green? Is this the right question?

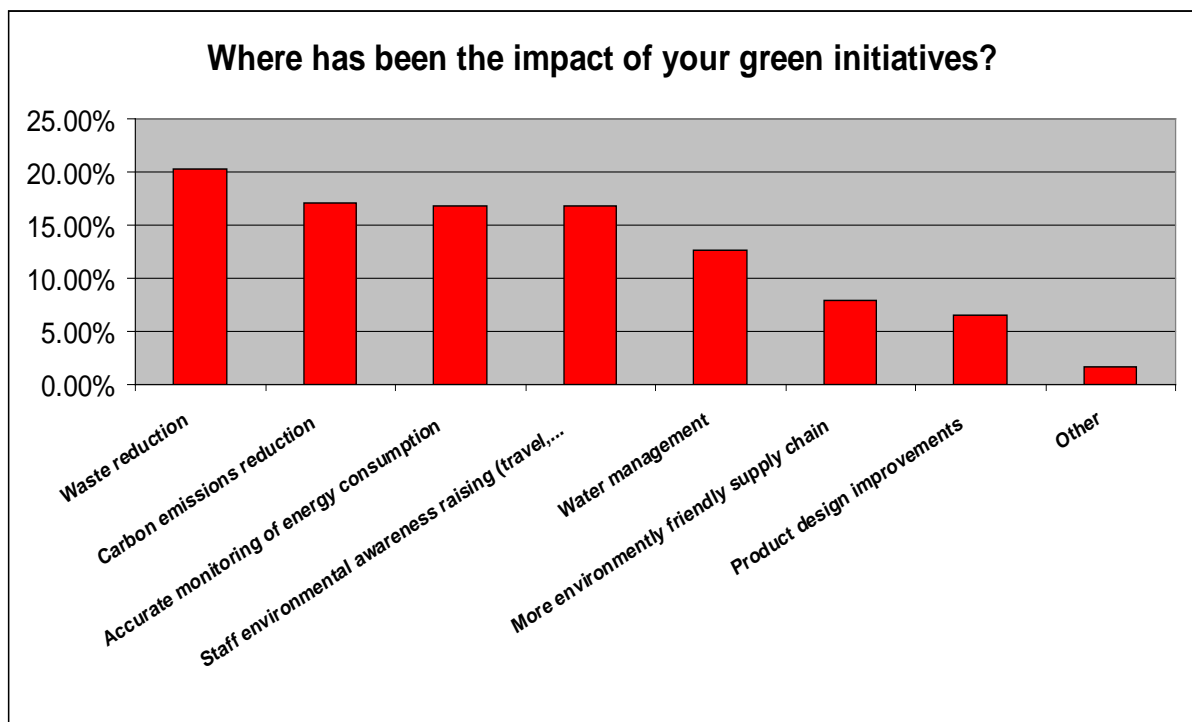
This article first appeared in the Lean Management Journal, 2010, Issue 3 (March/April).
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By K. Zokaei, March 2010

While the 'lean and green' debate has so far focused on addressing whether lean is green, leading companies have moved onto 'making lean work for green'. There are intrinsic linkages between lean and green – not least due to the relentless focus of lean on waste elimination. Nonetheless, there is also academic evidence that lean firms are not necessarily 'greener' than industry average which is exactly why a conscious symbiosis of lean and green is required. After all the fundamental building block of lean thinking is continuous improvement which perfectly fits with the notion of creating a greener and more socially responsible industry. Over the past two decades the lean community has attained the wisdom of pursuing operational improvements regardless of the short term financial justifications knowing that a continuous improvement culture pays off over the medium to long term. The next challenge for the lean community is to consciously account for the environmental and social issues; the initial gains are likely to be more than incremental.

Climate change and other environmental challenges have already affected every aspect of the economy and society. The UK Government's Climate Change Act (2008) commits the UK to reducing its territorial Greenhouse Gas Emissions (GHG) to 80 percent of 1990 levels by 2050. Industry leaders such as Adnams brewers, GKN and Mars Foods are not waiting for such targets to be reinforced through legislation and are acting swiftly to make green an integral part of their continuous improvement activities. At the Lean Enterprise Research Centre we have recently conducted a project to develop an initial body of evidence to evaluate the efficacy of the application of lean tools and

concepts for carbon management¹. A survey was launched which identified the key strategies and techniques applied for carbon reduction within industry. The findings reveal that at a strategic level most companies are focused on end-of-pipe solutions and reactive approaches such as waste and emissions reduction, whereas proactive solutions such as product design and supply chain optimisation are less explored as illustrated below.



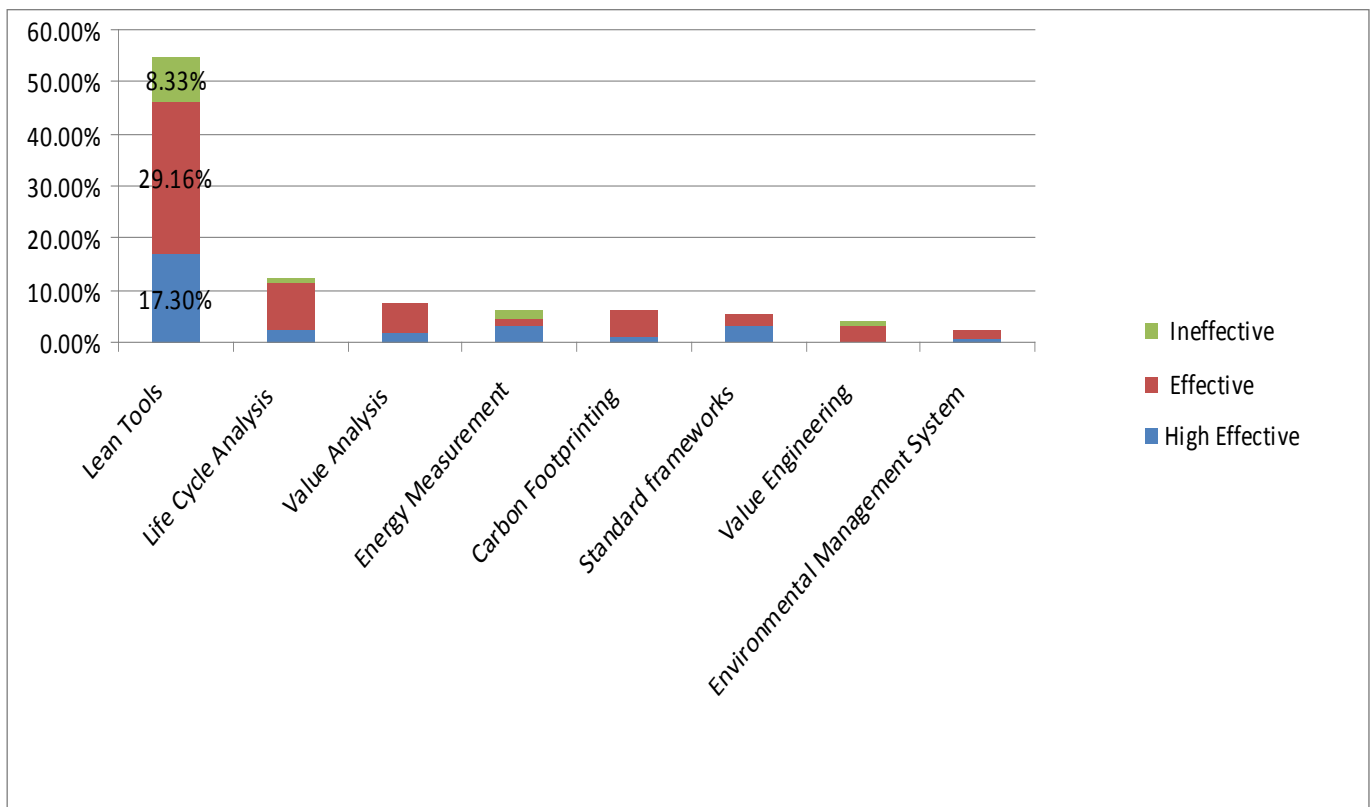
We also investigated the explicit strategies deployed by companies for carbon reduction. Interestingly 38 percent of respondents deploy lean as a strategy for carbon reduction. At the same time more reactive strategies such as waste reduction and waste recycling have a much higher adoption ratio (both at 83 percent). However, when we looked at the tools and techniques adopted within industry for carbon reduction, lean tools were the most popular. The following figure summarises the findings while also demonstrating the perception of the users about the effectiveness of various

¹ I am grateful to CO₂ Sense Yorkshire for funding the project and to the project team for their inputs: Fabien Martinez, Andrea Pampanelli, Barry Evans, Dr. Diego Vazquez and Kaveh Sarmadi.

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approaches in application. The results indicate that not only the lean tools have by far the highest level of application but also the highest level of effectiveness.



Even more importantly we found that a large majority (i.e. 73 percent) of those who drew upon lean techniques for carbon reduction regarded cost as a strong driver behind implementing green initiatives. This strong relationship arguably shows the importance of lean (both as a concept and a toolbox) for simultaneous economic and environmental performance enhancement. In summary the survey showed that certainly lean is regarded by managers as means of green. However, while many firms are deploying lean tools and techniques for carbon reduction, there is a lack of an integrative framework for creating a strategic symbiosis between lean and green. The lean community can play a key role in moving their companies beyond reactive approaches such as waste reduction and end-of-pipe solution such as recycling. In order to reap the real benefits green initiatives should be systematically integrated into continuous

improvement programmes and companies should adopt more proactive approaches such as whole life cycle thinking and 'lean and green design'.

Having gauged the current level of adoption of lean and green through the survey, the research moved on to investigate 'how leading companies are creating synergies between lean and green in practice'². We looked at two leading companies: Adnams brewery in the UK and GKN driveline in Brazil. Our study shows that these leading firms deploy an integrative and systematic approach to the implementation of environmental solutions where tools and techniques are underpinned by robust understanding and the principles of continuous improvement. However, at the same time, we found two distinctive approaches. Adnams is driven by strong corporate values from the top that drives fairly significant step changes, whereas GKN relies on a systematic but incremental delivery of environmental benefits. The two are very different in terms of size, competition and management needs; but they are common in being successful in very competitive markets relying on committed staff and lean systems (more so in the case of GKN).

Adnams looked at the whole life cycle of their products, identified the key environmental hotspots and tackled them either at the design stage (e.g. designing a lighter bottle which saved 32% CO₂ emissions) or by investing in greener facilities and technologies (e.g. grass roof warehouse and state of the art brewing equipment). The company is driven by visionary management and a top-down analysis of environmental data. Adnams only has around 350 employees which allows the top management visions to be effectively communicated and implemented. By talking to various members of staff we found a strong sense of belonging and association with corporate social responsibility values. However, Andy Wood, company's MD sees the next stage in Adnams evolution to be a much more systemised way of measuring and communicating environmental issues both top-down and bottom-up.

GKN on the other hand, is a very large manufacturing firm with around 150 plants around the globe. GKN has adopted a 'lean and green Kaizen' methodology at the cell

² I would like to acknowledge the contribution of two exceptional PhD scholars at Cardiff University Andrea Pampanelli and Fabien Martinez who took the lead in conducting the case studies. I am also grateful to Neil Trivedi and Andy Wood for sponsoring the case studies.

level which directly builds on the company's 8 steps Kaizen approach. This bottom-up lean and green approach paid off in GKN driveline Brazil where combining the operators and leaders ideas and experience and using the appropriate lean tools and techniques identified operational cost reductions of around 27% amounting to US\$ 76K per month and average resources reductions of about 50% (environmental benefit). In one year, these improvements could represent more than US\$ 900K only within the selected cell. The following table shows the resource reduction within the cell. These improvements would not have been possible without a strong lean culture where all employees contribute towards identifying and delivering incremental improvements (in this case in a concentrated effort for a single cell). Here lies an important difference between the two cases: no top-down project or hotspot analysis is able to deliver such considerable improvements unless all frontline employees are fully engaged.

Cell consumption	Before State Generation or Consumption	Future State Generation or Consumption	% Reduction
Energy (Mwh/Month)	261	240	8%
Metallic Waste (Tonnes/Month)	55	37	33%
Chemical Products (liters/Month)	412	35	91%
Hazards Waste (Tonnes/Month)	0.3	0.1	67%
Effluent (m3/Month)	2.5	0.8	69%
Water (m3/Month)	2.9	1.9	34%
Total	-	-	50%

As a matter of fact the author believes that a combination of both bottom-up and top-down approaches is the best way in order to create a true symbiosis of lean and green.

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Our work has continued to develop a suite of tools for systematic 'lean and green' diagnosis and improvement. But similar to lean, having a toolkit alone is hardly a solution for lean and green. What will be much more effective is commitment to true integration of the two and the deployment of clear alignment tactics following the principles of Hoshin Kanri.

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