Sustainability is the key driver of innovation

abstract
Innovation opportunities - building business platforms will allow technology development centered on sustainable development efforts. The presentation will discuss the growing enthusiasm for sustainability within the business and metric reporting. We will link business values and sustainable work projects, how to challenge your workforce to engage in business innovation training and develop innovation programs that are aligned with business sustainability improvements. The examples will provide global evidence of how sustainability pays for all stakeholders.

introduction
Sustainability and innovation are both important and critical issues for organisations. Based on surveys and interviews sustainable development (SD) is driving business innovation and will continue to do so for the next decade.

The last ten years has allowed for a change and positive adoption rates in companies' understanding of sustainability. Many companies were convinced that the more environment-friendly they become, the more the efforts would erode their competitiveness. They believed SD initiatives add costs and will not deliver immediate financial benefits.

Companies have engaged in many different methods to foster innovation, from cultural changes to incentivising employees for being innovative. New technology was the catalyst for business innovation in the 1990s, however, few have made the connection between innovation and sustainability or have used sustainability as a way to improve innovation performance. Sustainability is a new way to engage in business innovation and gain or maintain a competitive advantage. Business innovation involves more than just science and technology, it is a social process in which both economic and ultimately governance factors have important roles. In the last few years, more and more companies are looking to play catch up to the leading companies in the United States. As a result, we are seeing sustainability being driven from a group of top leadership.

MIT Sloan's 2012 Sustainability & Innovation Global Executive Study asked 2,600 executives across various industries about innovation and the role of sustainability. 48 per cent responded that they had changed their business model to incorporate sustainability, up from 40 per cent in 2011. Of those, 75 per cent reported that they broke even or made a profit, and 46 per cent said sustainability added to their bottom line.

There are still a number of senior business leaders today that think sustainability is disconnected from the core of their business; however, research suggests that sustainability is strongly tied to the ability of the company to innovate. Recent completed research demonstrates that being a sustainability leader can significantly raise your company's chances of being a top innovator.

When the question was asked if sustainability is linked to innovation, the results showed a 2009 sustainability leader is 400 per cent more likely to be an innovation leader in 2009 and 600 per cent more likely to be one in 2010. Sustainability and innovation are linked together, as shown in fig. 2.

why are we seeing such a strong link from sustainability to innovation?
Sustainability can provide a different 'lens' for thinking and helps companies to approach situations differently. Thinking about different subjects or thinking differently about existing subjects creates new ideas. Thinking differently can unlock companies' innovative potential. They may see situations from a different point of view. They may re-examine their perspective of what's important, and they can tap into new ideas. Many environmental health & safety (EH&S) leaders are becoming more involved in the ideation sessions.

A study from 2004 projected sustainability is part of the sixth wave of innovation. The use of bio products and green chemistries were predicted to increase significantly. The time for implementation continues to be shorter than previous waves of innovation. Fig. 3 shows the rate of change in the US, which was predicted to increase with technology and the ability to adopt change.

adding constraints
Sustainability can also help drive innovation by adding constraints. While constraints are often seen as reducing the ability to be creative, that is not always the case. The constraints imposed by regulations are moving us to reserve resources for future generations. Sustainability can actually serve as a great way for a company to think differently and therefore act innovatively. For instance, viewing emission standards as a new constraint may lead to ideas for improving energy efficiency and reducing the volume of resources required.
Both types will open new roads to organisations which may not have engaged in this type of thinking. The types of innovations will differ according to the innovation systems and socio-economic conditions of different countries, and needs critical assessment.

Innovative leaders speak out around the world
CEOs and world leaders continue to speak out on linkages of business innovation to sustainability.

Bill Gates called on world leaders to invest more in innovation for development, describing innovation as the “most powerful force for change in the world”. “Innovation fundamentally shifts the trajectory of development,” Gates, founder of the computing corporation Microsoft and co-chair of the Bill & Melinda Gates Foundation, told the summit of the Group of 20 major advanced and emerging economies (G20) in France on 3rd November 2011.

Leaders are setting the stage in key areas around the world
Gates said that, despite some successes, “Innovation has not played as big a role in development as it could have”. He continued: “Some innovations take hold in rich countries quickly but take decades to trickle down to poor countries. The pace of innovation specifically for the poor has been too slow. But I believe it can be sped up, and the rapidly growing countries of the G20 are especially well positioned to drive this improvement.” In particular, he said, the G20 should identify the “highest priority innovations for development” including areas of agriculture, health, education, governance, manufacturing and infrastructure.

“One of the newest resources for development - and potentially one of the most transformative - is rapidly growing countries’ capacity for innovation. Countries like Brazil, China, India, and Mexico are in a great position to work closely with poor countries because they have recent experience in reducing poverty, as well as enormous technical capabilities,” Gates said. “This unique combination gives them both the insights and the skills to create breakthrough tools for development.”

customers are asking the questions
Even if a company is not investigating about how to incorporate sustainability into business operations, it is very likely that at least some of their customers are. The organisation is at risk and potentially missing out on valuable opportunities if they do not include the topics in the search for innovative ways to provide value to these customers.

The business case for sustainability is a well-defined list of benefits, both tangible and intangible. These include, but are not limited to: cost savings, quality improvements, attracting and retaining talent, enhancing reputation, and compliance, amongst others. Innovative sustainable development’s potential is a way to create opportunities for companies to tweak or radically improve their products and services in a way

innovation types
There are two different distinctions between innovation types. The two types include:

- Sustaining Innovation - incremental advantages
- Disruptive Innovation - radical thinking

![Innovation fundamentally shifts the trajectory of development. Bill Gates, founder of the computing corporation Microsoft and co-chair of the Bill & Melinda Gates Foundation.”](image)
that reduces their environmental impacts. The services and products deliver new features and benefits.

Sustainability-driven innovation includes: identifying new applications for current services and products, upgrading business processes, developing new products and services, using or creating new technologies and changing management techniques.

- Identify key areas for improvement - not all sustainability initiatives are created equal in terms of potential to create business value.
- Prioritise projects - don’t follow the leader, but instead prioritise projects based upon your individual company strategy.
- Measure key performance indicators and results against target: establish meaningful targets for improvement with verifiable data.

**Implementation of Small Ideas Assisting – People, Planet, Profits (3Ps)**

Sustainability-focused innovation does not have to mean an overhaul of the entire organisation. Even the small ideas can save big and have a big impact. Many examples exist where a small change led to bigger changes and bigger savings, for the company, as well as for the planet.

For example, UPS' no left turn policy resulted in savings close to $20 million a year. 3M’s 3P program (Pollution Prevention Pays) encourages employees to rethink products and processes. The 3Ps saved 3M nearly $1.7 billion, and eliminated more than 3.8 billion pounds of pollution as a result. A foundry is providing approximately 200,000 cubic yards of foundry by-products to facilitate the construction of a community sledding hill, ice rink, amphitheatre and parking for residents in the City of Waupaca, Wisconsin. The 3Ps is allowing for a reduction of landfill, community benefit and reuse of a natural mined material.

The members on the committee have created a list of items which to most are small ideas, which once reviewed show significant impact to the triple bottom line.

Use of challenges was tested by an APS member company to generate ideas for innovation using the principals of SD. In 2013, the member company used specific challenges to engage and educate employees in the process of innovation. The business innovation team includes approx. 45 employees or 5% of the company. Six company-wide challenges were posed to all internal stakeholders in the form of questions. A challenge was supplied monthly to the organisation from May to October 2013. The group was given three weeks for each challenge to provide responses as well as build on other responses. A tracking system was provided and individuals would email their responses to a contact person.

All employees were asked to engage in the process and each facility had to provide a set number of ideas into the tracking system over the time period. The group submitted over 300 responses during the six months. The challenges served as a way to assist the facilities in achieving their goals. As ideas were received the concept of idea mapping was utilised. This tool worked to advance the ideation to the next level. With a focused approach individuals were able to contribute ideas concerning a topic with little background information.

![Fig.5 An example of an Idea Map(8)](image)

**Idea Mapping** is a powerful whole-brained visual thinking tool that enhances memory, note-taking skills, thought organisation, planning, creativity, and communication. It uses colour, keywords, lines and images to connect thoughts associatively. Idea maps are the natural expression of the way the brain processes information associatively. Idea mapping is a simple and profound tool that helps individuals and organisations improve productivity, clarify thinking, save time, and enhance learning, while simultaneously producing incredible results.

**Building a pipeline of ideas**

Once you have the ideas, you can spend time reviewing and identifying those to pursue.

- **Focus on the Front-End:** Innovation leaders spend more time working the innovation process to identify higher-quality ideas at the front end and consequently fund more sustainable ideas than their peers.
- **Collaborate Externally:** Top performers devote more to open innovation with stakeholders, thus they are better at combining external technologies with internal capabilities.
- **Optimise the Best Ideas:** Leading innovators spend more time in the innovation process and less time in execution.
- **Improve Transparency:** The best companies communicate and collaborate on successes and failures to continuously improve the process.

Developing the ideas into your strategic planning process is key to maintain momentum. Continue to dig deeper - using different tools. Collaborate where it makes sense with external stakeholders, follow the value creation and support future opportunities.

**Linking to bottom and top line returns to the triple bottom line**

Research shows that sustainable development cultures create organisational and technological innovations that yield both bottom-line and top-line returns. Becoming environment-friendly lowers costs because companies end up reducing the inputs they use. In addition, the process generates additional revenues from better production or enables companies to create new businesses. In fact, because those are the goals of corporate innovation, we find that smart companies now treat sustainability as innovation’s new frontier.

Leadership and talent are critical for developing a low-carbon economy. The current economic system has placed enormous pressure on the planet while catering to the needs of only about a quarter of the people on it, but over the next decade twice that number will become consumers and producers. Traditional approaches to business will collapse, and companies will have to develop innovative solutions. That will happen only when executives recognize a simple truth: **Sustainability = Innovation**. Indeed, the quest for sustainability is already starting to transform the competitive landscape, which will force companies to change the way they think about products, technologies, processes, and business models.

The key to progress, particularly in times of economic crisis, is innovation. Just as some internet companies survived the bust in 2000 to challenge incumbents, so too, will sustainable corporations emerge from today’s economic conditions to upset the status quo.

**By-product synergy**

By-product synergy is the matching of wastes and under-valued resources at one facility with potential users at another - the results include reductions in...
operating costs, improved environmental performance, increases in energy efficiency, reductions in CO₂ emissions, and job creation and retention. – Definition provided by The United States Business Council for Sustainable Development (USBC-SD)

Communicating the current practices of the metal casting industry is important since the industry is one of the oldest recyclers, (examples - slag, spent foundry sand, packaging, etc.). Utilising the triple bottom - economic, governance, and social elements, allows for the projects. One innovative idea is to engage in by-product synergy groups. The groups allow the audiences to identify opportunities across organisations and industries. The AFS First Group has been engaged in the reuse of spent foundry sand for over a decade. The USBC-SD has been working on by-product synergy efforts for many years and across industries. Recently the AFS sustainability committee has been in discussions with the group to leverage the current projects for growth.

There are also innovations in the way organisations are arranged, in the way agendas are set, in the way funding is allocated, and in ways of ensuring accountability.

Many constraints placed on metal casters from regulatory agencies or a local community has and will continue to force the innovation process. Many on-going projects already include the following: recognition of the efforts in the projects and taking credit for the efforts is missing from the metal casters surveyed.

Examples include:
- Reclamation or onsite beneficial reuse of spent foundry by-products (sand, slag, etc.)
- Reduction or greater implementation of energy use
- Reduction or greater implementation of water use
- Utilisation of state-of-the-art pollution control equipment (air, water, etc.)
- Substitution of process chemicals/materials with less hazardous replacements
- Improvements in land use management sustainability initiatives, (being a local resource, employee health programs)

The results from interviews and the AFS survey showed that companies that pursue sustainability significantly increase their chances of becoming innovative leaders in the process. This is consistent with a conclusion noted where innovation became stronger over time - the assumption being that using sustainability as a lens can lead to innovative ideas, some of which take time to become visible from the outside and therefore would show up in future years' innovation results.

conclusion
sustainability is on the rise and will drive business innovation. Metal casters are encouraged to communicate the great elements of sustainability already implemented in the organisations and industry. Additionally, metal casters are being requested to set goals which drive innovation for a competitive advantage. Creating a culture that includes change management techniques allows individuals to create change. Continuing education is key for gaining innovative ideas from the viewed constraints. Engaging all stakeholders allows for ideation excellence. Sustainable-driven innovators in the metal casting industry will outperform financially.

The committee is striving and encouraging metal casters to develop and publish sustainability policies. The policies are used to communicate and convey companies' individual messages on their advancements. The AFS research and activities provide a working document and template for metal casters to communicate their findings in the form of metrics and reporting. Many new ISO programs around the world are looking to assist individuals in making the commitments.

A comparison survey was completed initially with a group of 60 global companies. The original responses were obtained in early 2012 with a follow up in late 2013. The results are consistent with the research and discussions with key leaders. During the 15-month time period, education sessions and committee work communicated at events resulted in a 73% improvement in understanding and efforts for communications on linking sustainability with innovation.

Innovation is driven by sustainable development activities completed in organisations. Sustainability activities bring a new set of data to the table. Reviewing constraints in a positive manner, engaging with stakeholders and acting on your ideation events allows you to grow in your triple bottom line.

references

additional reading
- Green Rankings, Newsweek, 2009-2010.

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