

# The 'Business' of Resource Efficient Design

## Making Business Sustainable and Profitable

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### Abstract

*We are a nation of around 7.2 billion people today. According to the United Nations, this figure is expected to increase to 8.6 billion in 2030 and 9.8 billion in 2050. 'The World Count' (a 'live' web counter) states that the amount of natural resources present on the earth is enough to satisfy the needs of only (about) 2 billion people. The writing on the wall is clear...in order to safeguard our dwindling natural resources, we need to 're-think' our current business practices of 'unrestricted' and 'unsustainable' growth to more sustainable means of production and consumption. 'Resource Efficient' Design plays a critical role in this endeavour, as it aims to prevent waste and use resources for longer, thus building a more resilient and sustainable business economy. The current article delves on the concept of resource efficient design and its significance in making businesses more sustainable and profitable. Key policies that could drive resource efficiency and few case studies are briefly presented, followed by some recommendations that conclude the article.*

### Introduction

According to the International Resource Panel of the United Nations Environmental Programme, current business-as-usual (BAU) production and consumption patterns of the world will lead to consumption of 140 billion tonnes of natural resources (minerals, ores, fossil fuels and biomass) per year by 2050. This is more than twice the amount of today's consumption levels of 60 billion tonnes [EEB(2015)]. In India, around 97 per cent of all materials (abiotic and non-renewable) consumed, are extracted domestically. Between 1970 and 2010, around 420 per cent of such primary raw material was extracted, which, according to the Government of India's 'Strategy on Resource Efficiency', is lower than the Asian average but higher than the world average. Notably, extraction of non-metallic minerals has grown during this period, especially to

cater to the ever-growing construction sector. With a population of 1.3 billion, accounting for 18 per cent of the global population, but living on only 2.4 per cent of the world's surface, India is expected to face significant resource constraints in the coming years [NITI (2017)].

In addition, according to an Indo-German Environment Partnership (IGEP) report, India's material requirements are projected to be almost 15 billion tonnes by 2030, as per its medium growth scenario. This means a tripling of its primary materials demand (especially energy carriers, metals and non-metal minerals) as compared to 2010. Increased domestic resource extraction is thus expected to exert tremendous pressure on natural resources such as land, water and air [NITI (2017), IGEP (2013)].

Going by the above statistics, businesses across the

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globe can no longer afford to tread the “business-as-usual” pathway of 'unrestricted' economic development. There is an urgent need to shift from this traditional growth paradigm of depleting natural resources (minerals, ores, fossil fuels and biomass) and proliferation of waste, to a new development paradigm, where economic growth goes hand-in-hand with environmental and social development (constituting the three pillars of sustainable development) and embraces the concept of resource sufficiency by adopting the philosophy of 'resource efficient design'.

### The Resource Efficient Design Concept: What Does It Actually Mean?

So what exactly is “Resource Efficient Design”? Have businesses not been adopting 'efficient and eco-friendly design' practices for some time now? For example, have they not designed energy efficient refrigerators and air-conditioners and energy saving washing machines? What about using bio-degradable and eco-friendly materials in products instead of the polluting and non-degradable plastic? If these questions are resonating in your mind, let me try and explain this concept of 'resource efficient design' in more detail.

#### BOX 1

##### Resource Efficient Design: The New Vision

Redefining businesses to be more:

**Responsible:** redefining goals around social/eco-equity needs.

**Synergistic:** involving different elements to create positive and synergistic systematic changes.

**Contextual:** re-evaluating designing

conventions and concepts towards social transformation.

**Holistic:** taking a lifecycle view to ensure low-impact, low-cost, multifunctional outcomes.

**Empowered:** fostering human potential, self-reliance and ecological understanding in appropriate ways.

**Restorative:** integrating the social and natural world.

**Eco-efficient:** aiming to increase the economy of energy, material and costs.

**Creative:** transcending traditional boundaries of thinking and moving into a more 'out-of-the-box' way of life.

**Visionary:** focusing on the future of product design and developing appropriate methods, tools and processes to deliver them.

**Source:** Birkeland, J. (2002) Design for Sustainability: A Sourcebook of Integrated, Eco-Logical Solutions, Earthscan Publications, Sheffield, UK; Module on Resource Efficient Design, DMU, Leicester, UK.

#### *Resource Efficient Design: From Past to the Present*

It all began with the 'Green Design' phase that occurred during the 1960s and 1970s, courtesy the growing concern about the 'finiteness' of our natural resources and the emergence of environmental groups like 'Friends of the Earth' and Greenpeace. During that time, Victor Papanek, designer, educator and staunch advocate of ecologically and socially responsible design, and a few others like him, embarked on 'greener' ways to develop products. One such product was a radio he and his students made from a transistor that worked on paraffin wax and a wick fixed inside a recycled juice can [Ozawa-Meida & Lemon (2016)].

Post the 'Green Design' phase came the 'Eco-design' phase in the 1980s and 1990s, when environmental crises like the Bhopal Gas Tragedy and Chernobyl nuclear disaster, resulted in increased environmental regulation and safety norms being prescribed [Ozawa-Meida & Lemon (2016)]. This gave rise to 'eco-friendly' products being designed, which took into consideration the environmental impacts across the entire lifecycle of the product, right from extraction of raw materials to processing, manufacturing, distribution, use and finally, recycling and disposal.

But unfortunately, both the 'green design' as well as 'eco-design' phases could neither curb the continued depletion of our resources (natural resources as well as metals, ores and minerals), nor the looming threat of climate change. So this gave rise to the new phase of design called 'sustainable design' which took into consideration the fact that 17 per cent of the world's population consumes 80 per cent of the world's resources [Ozawa-Meida & Lemon (2016)]. This meant designing products that not only took care of environmental concerns but also social and ethical concerns.

More recently, designing for sustainability gave rise to the futuristic version of 'resource efficient design', which brings into perspective not only the design of the product, but also how we can use resources for designing in a more efficient way. Thus, Resource Efficient Design can be broadly defined as, "the design of more sustainable products, processes, services, and systems which aim to increase the longevity of a product by using resources in more efficient ways." This concept not only addresses sustainable design of the product, but also encourages businesses to rethink the way in which they deliver these products to meet their objectives in a more holistic, systemic and sustainable manner

(BOX1) [Ozawa-Meida & Lemon (2016)].

#### *From 'Cradle-To-Grave' to 'Cradle-To-Cradle'*

As we all know, there are different stages in a product's life. These together are called the 'lifecycle' of the product and include the stages of extraction of raw materials, processing, manufacturing, distribution, use, recycling and disposal (Figure 1). As can be seen in Figure 1, the lifecycle process is linear; there is a start and end stage of the product. This is called the 'cradle-to-grave' approach, which, while giving due consideration to the environmental impacts related to production (following the 3Rs of 'reduce, reuse, and recycle'), does not actually consider the finiteness of resources and the need to 'put back' into the natural environment what we have taken.

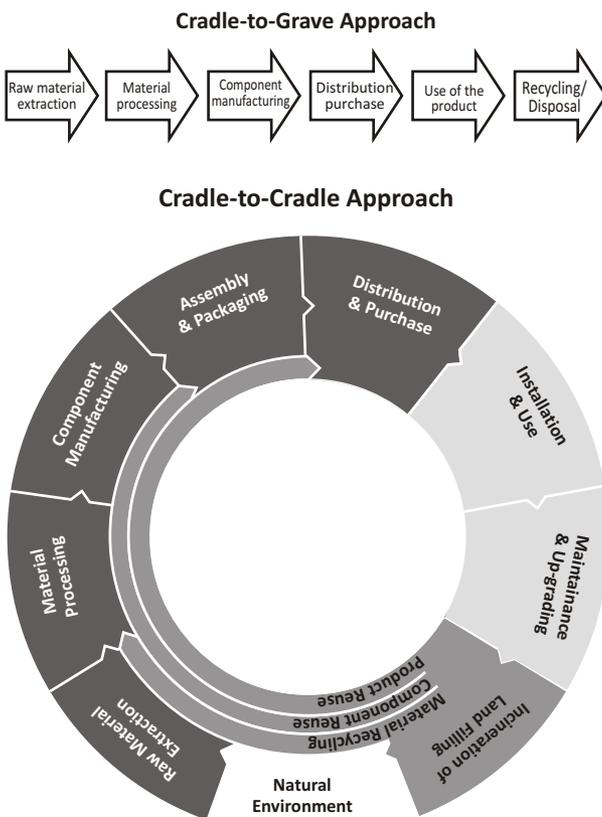
In order to bridge this gap in the lifecycle, it is imperative that we decouple economic development from our natural resources, thus taking a 'circular' approach or a 'cradle-to-cradle' approach of designing products (Figure 1). This would entail increasing the longevity of the product and minimising waste through the process of sharing, renting, repair and reuse by following the 5Rs of 'reduce, reuse, refurbish, repair and recycle', thus forming a 'closed-loop' system. Resource efficient business models would thus provide [GG (2017)];

- i. Services: This would be based upon delivering holistic performance outputs rather than simply selling products.
- ii. Hire and lease: To ensure longer-term product durability by leasing out products for return after use.
- iii. Incentivised returns and re-use: Encourage customers to return used items for refurbishment and re-use.

- iv. Long life: Design products to be more durable and sustainable.

Some examples of the cradle-to-cradle approach are discussed in the 'Case studies' section of this article.

**Figure 1: Cradle-to-Grave and Cradle-to-Cradle Business Approach**



**Source:** White *et al.*, Okala: Learning Ecological Design, Phoenix; Module on Resource Efficiency, DMU, Leicester, UK.

**Sustainable Business: How Profitable is It?**

With the design stage of a product accounting for more than 80 per cent of the lifecycle’s environmental impacts, it is crucial that enough care and time be given to this stage by designing for sustainability. But at the same time, for any business

to be a success, profitability plays a very important role. So can a sustainable business be profitable too? Let's find out. According to a survey carried out by the Massachusetts Institute of Technology (MIT), US, it was found that 75 per cent of companies who changed their business model to a sustainable one either broke even or showed a profit from their sustainability activities, and 46 per cent said their sustainability activities added to profits. Marks and Spencer (M&S), the global clothes brand's sustainability strategy, Plan A, is an example. Introduced in 2007, Plan A, which aimed to achieve 100 goals related to waste, supply chain, climate change, and health, had led to about US\$296 million in net economic benefits by 2015 [MIT (2013)].

A study by CDP (formerly the Carbon Disclosure Project), North America, showed that the Standard and Poor's (S&P) 500 companies who built sustainability into their core strategies outperformed those who did not. Corporations who actively managed and planned to tackle climate change risks, secured an 18 per cent higher return on investment (ROI) than companies who did not and 67 per cent higher than companies who refused to disclose their emissions [CDP (2014)]. This says a lot. According to Meg Whitman, Former Chairman and CEO, Hewlett Packard, “by integrating sustainability across the entire value chain, companies can capture return on capital today and build leadership and business value for their future.”

A 2015 Sustainability Imperative Report by Nielsen, the global, independent measurement and data company for fast-moving consumer goods, found that 66 per cent of consumers were willing to pay more for sustainable brands that are manufacturing products in a socially responsible manner — an increase from 55 per cent in 2014, and 50 per cent in 2013 [Nielsen (2015)].

*Resource Efficient Design: Key Business Benefits*

Given this background, the range of possible benefits that could accrue to companies that introduced resource efficiency methods and techniques into their business practices are summarised in Table 1.

**Table 1: Business Benefits of Resource Efficiency**

Live better	Resource efficiency improves quality of life, e.g. efficient lighting systems help people save electricity, more resource productive factories produce better goods, and energy-efficient buildings create a cleaner environment for all.
Pollute and deplete less	Efficiency reduces waste and pollution, thus contributing significantly to reducing emissions and also saving valuable natural resources.
Make money	Yes! Resource efficiency helps save money: it converts valuable resources into useful products and services (rather than waste), and reduces costs related to the highly expensive process of waste disposal.
Harness markets and build competition through individual choice	While market forces combined with innovative policy mechanisms can help drive resource efficiency, much of it can be driven by individual choice and business competition.

Multiply use of scarce capital	The money saved by preventing waste can be re-invested for other efficiency purposes. E.g. money saved in developing energy efficient lighting can be reinvested into providing energy services at a tenth of the cost of building another power station. By recovering that investment at least three times faster (due to efficiency practices) and reinvesting it, the services provided by the newly invested capital are expected to rise more than 30-fold.
Increase employment and improve productivity	By reducing the amount of unproductive resource allocation, money can be saved and reinvested into more skilled and productive labour.

**Source:** Weizsacker, E.U., *et al*, *Factor Four: Doubling Wealth, Halving Resource Use*, Earthscan, UK; *Module on Resource Efficiency*, DMU, Leicester, UK.

**Drivers and Barriers to Resource Efficiency**

A European Commission report analysed and identified the key drivers and barriers that impacted resource efficiency in EU businesses. The main drivers identified were rising prices of commodities and key raw materials, supply-side partnerships and collaborative initiatives, competitiveness and potential bottom-line cost savings. Key barriers included lack of access to funding, market demand, knowledge and capability, and ability to implement cost-effective technological solutions which avoid lock-in [AMEC (2013)]. Figure 2 provides a more detailed picture.

### Key Policies that Could Drive Resource Efficient Design in India

Compared to the European Union (EU), the policy framework for resource efficiency in India is still in a nascent stage. Some of the key policies that are expected to drive this upcoming sector are described here.

### At the Global Level

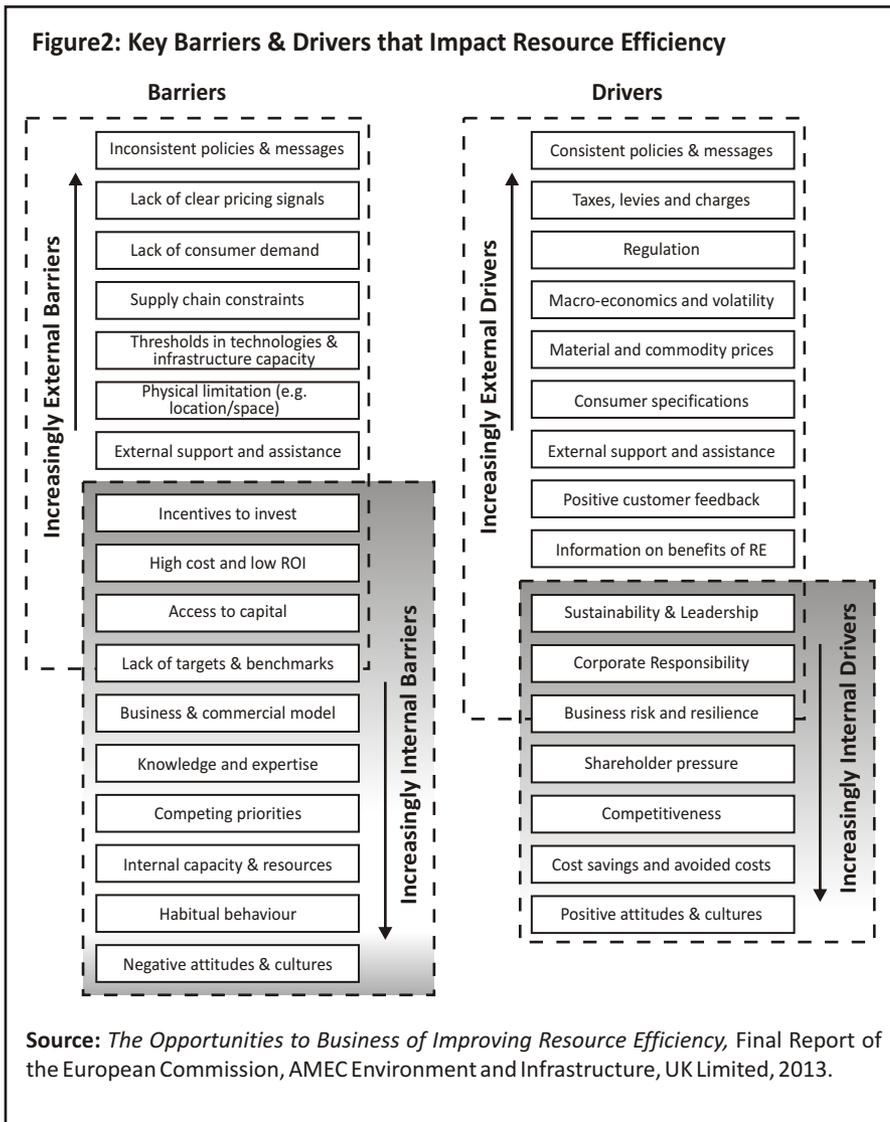
- Sustainable Development Goals

In September 2015, the UN General Assembly issued the Sustainable Development Goals (SDGs) which build on the Millennium Development Goals of 2000. There are in all 17 SDGs and 169 targets. Goal 7 (affordable and clean energy), Goal

11 (sustainable cities and communities), and specifically, Goal 12 (responsible production and consumption) and Goal 13 (climate action), relate to the efficient and judicious use of our natural resources.

- Intended Nationally Determined Contribution

India's Intended Nationally Determined Contributions (INDCs) are its voluntary pledge to the Paris Agreement of 2015 to maintain global CO<sub>2</sub> levels below 2°C (above pre-industrial levels). The INDCs promote resource efficiency, mainly through their commitment of reducing emissions intensity to 33-35 per cent (above 2005 levels) by 2030, achieving about 40 per cent cumulative electric power from non-fossil-fuel-based energy resources by 2030, and creating an additional



carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub> equivalent through additional forest and tree cover by 2030.

#### *At the National Level*

- National Design Policy

The Department of Industrial Policy and Promotion (DIPP), Government of India, established the National Design Policy in 2007, with the aim of promoting a “design enabled Indian industry” which could impact both the national economy and the quality of life in a positive manner. The policy aims to acquire global positioning and branding of Indian designs and make “Designed in India” a by-word for quality and utility in conjunction with “Made in India”. It also aims to recognise and award industry achievers in creating a brand image for Indian designs through the award of 'India Design Mark' on designs which satisfy key design criteria like originality, innovation, aesthetic appeal, user-centricity, ergonomic features, safety and eco-friendliness [DIPP (2017), YES-TERI (2018)].

- Bureau of Indian Standards Act

The Government of India introduced the Bureau of Indian Standards (BIS) Act, 2016, that superseded the earlier Bureau of Indian Standards Act, 1986. The BIS certification covers a wide range of products such as cosmetics, textiles, batteries, electrical and electronics goods, packing/packaging materials, plastics, food preservatives and additives, etc. Under its Eco Mark scheme, BIS provides certification and labelling for household and other consumer products that meet certain environmental criteria along with quality requirements prescribed in relevant Indian Standards for the product [BIS(2016), YES-TERI (2018)].

- Strategy on Resource Efficiency

Issued in November 2017, the strategy paper (which stresses on resource efficiency through the entire lifecycle of the product, including the design phase) is developed with the recommendations from the Indian Resource Panel (InRP) — an advisory body under the Ministry of Environment, Forest and Climate Change (MoEFCC) — through the support of Indo-German bilateral cooperation, to assess resource-related issues facing India and advise the government on a comprehensive strategy for resource efficiency. It outlines the rationale and key recommendations for a resource efficiency strategy that can be adopted by the government. The focus of the strategy is on abiotic resources that are not used for energy production (ores, industrial minerals, construction minerals) to be supplemented by the material use of biotic resources in the future [AG(2017)].

#### **Case Studies**

##### *The BlueGEN Concept*

Social enterprise iPower is focused on reducing energy bills and carbon emissions through BlueGEN installations (small scale fuel cells) in housing and other properties, in an effort to make clean energy affordable to all. iPower adopted a funded model for Micro-CHP provision whereby they lease the Micro-CHP kit to clients and the supplier bears the maintenance costs. The pilot became fully operational in January 2016, and is exceeding its projected performance, generating 3156 kWh in its first 85 days. It is estimated that the net savings for the pilot will amount to 19.96 per cent in Year 1, rising to 36.4 per cent by Year 10. CO<sub>2</sub> mitigation is estimated at 3–4 tonnes per year [AG (2017)].

*The Dutch Ministry's 5R Concept*

The Dutch Ministry of Defence (MoD) has approximately 42,000 military personnel in active service. Soldiers receive clothing and personal equipment on loan. At the end of active service, some of the clothing and equipment is returned. Around 35 per cent of the sorted clothing gets a second life in the MoD. The remainings are used in new products which have no link whatsoever to the defence clothing. Approximately 33 per cent of items are unsuitable for re-use and get fiberised to become new products such as wall insulation and car door panels, as well as blankets for refugees, bags and wall decorations. The MoD has mandated that new products purchased must have a recycled content, thus creating a revenue model. It is expected this will lead to additional revenue of approximately €750,000. The re-use of materials is expected to deliver savings of over 14,500 tonnes of CO<sub>2</sub>, 132,000 Gigajoule (GJ) of energy and almost 2.9 million m<sup>3</sup> of water. The project also contributes to the government pledge of creating 125,000 additional jobs for people with occupational disabilities [AG (2017)].

*Levi's Innovative Design Concept*

Levi's, the global jeans brand, has till date, saved more than 2 billion litres of water and recycled more than 200 million litres of water, using some unique waterless techniques. As of today, more than 40 per cent of all Levi's products are made with such techniques. By 2020, Levi's aims to produce 80 per cent of all its products using water-less innovations. With the launch of Levi's 'Authorized Vintage' collection and partnership with RE/DONE, a brand that recycles vintage Levi's jeans, 65 per cent of the water typically used during the lifecycle of a pair of jeans is saved, since no new water is used to

grow cotton. Levi's Authorized Vintage denim is renewed in different facilities in the US before being sold again, which significantly reduces the collection's footprint [LEVI (2018)].

*Hyderabad's Unique Waste Recycling and Disposal Concept*

Waste Ventures India (WVI), Hyderabad, has adopted an innovative and financially sound sustainable model that offers the city's first digital waste collection platform for households and small medium enterprises. WVI produces 'Sanjeevini Premium Organic Compost', which is 100 per cent organic and contains nutrients that outperform nutrient values for typical organic and vermicomposts in the market. The enterprise ensures pre-scheduled, hassle-free, door-to-door pick-ups, digital weighing, transparent pricing, and on-the-spot payment to the waste providers [WVI (2017), YES-TERI (2018)].

**Recommendations and Suggestions**

Indian businesses need to become more proactive in adopting business models that are resource efficient so as to ensure a more resilient and sustainable business economy in the future. In order to make this a reality, it is critical to introduce and implement appropriate policy, regulatory and financial measures, and increase awareness regarding the benefits of waste reduction and resource efficiency amongst policy makers, manufacturers and consumers. And finally, adopting the 'cradle-to-cradle' methodology that entails decoupling resource use from economic growth, will aid the transition from resource-intensive growth to a resource efficient growth paving the way for sustainable future. Some key suggestions (largely articulated by the Government of India's 'Strategy

on Resource Efficiency') are provided below.

- i. The EU EcoDesign Directive of 2009, is a framework directive that sets compulsory eco-design requirements for various product groups and helps address market failures related to incomplete or total lack of awareness, need for cost savings, etc., thus making way for the implementation of the 'cradle-to-cradle' approach. Moving in tandem with this directive, India needs to promote national voluntary standards like BIS 2016, to develop and strengthen design initiatives for improving resource efficiency in the country. While BIS has been working on adapting internationally accepted standards, a more coordinated approach with Indian Resource Panel (InRP) is recommended.
- ii. There is a need to develop cross-cutting policy instruments such as Green Public Procurement (GPP) that enables preferential procurement of eco-labelled products, standards, eco-labelling and certification for promoting resource efficiency in critical sectors of the economy. While an eco-labelling scheme from Ministry of Environment, Forest & Climate Change (MoEFCC) is in place, its impact has been limited; there is a need to develop certification and eco-labelling with emphasis on resource efficiency and secondary raw materials, addressing product reuse, durability as well as secondary resource usage. Incentives such as tax benefits for eco-labelled products would lead to price competitiveness and encourage consumers to purchase such products.
- iii. Consumers play a vital role in paving the pathway towards more efficient and sustainable resource use. But currently their understanding of eco-friendly products, (and resource efficiency) especially from a life-cycle perspective, is low. Raising consumer awareness is thus essential for a resource efficient future.
- iv. Provisions like Viability Gap Funding (VGF) can help businesses meet the initial high cost and become competitive over time by scaling-up and upgrading technology. Other innovative financing mechanisms could include private equity funding like green bonds, low interest loans to SMEs, improving access to loans by pooling loan demands and getting them ready for approval.
- v. There is an urgent need "to decouple escalating resource use and environmental degradation from economic activity and human wellbeing". Designing a 'product service system' that integrates products, services, supporting networks and infrastructure, and has lower environmental impacts, is the need of the hour.

## References

- AG (2017). *Amplifying Action on Resource Efficiency: UK Edition*, Aldersgate Group, UK.
- AMEC (2013). *The Opportunities to Business of Improving Resource Efficiency*, Final Report of the European Commission, AMEC Environment and Infrastructure, UK Limited.
- BIS (2016). [http://www.bis.org.in/cert/echo\\_mark\\_scheme.htm](http://www.bis.org.in/cert/echo_mark_scheme.htm).
- CDP (2014). *Climate Action and Profitability, CDP S&P 500 Climate Change Report 2014*, CDP North America.
- DIPP (2017). *National Design Policy*, Department of Industrial Policy and Promotion, Government of India.

- EEB (2015). *Delivering Resource Efficient Products: How Ecodesign can drive a Circular Economy in Europe*, European Environmental Bureau, Brussels, Belgium.
- GG (2017). <https://www.green-growth.org.uk/article/resource-efficient-business-models-80bn-opportunity>.
- IGEP (2013). *India's Future Needs for Resources: Dimensions, Challenges and Possible Solutions*, Indo-German Environment Partnership.
- LEVI (2018). [https://www.levi.com/US/en\\_US/features/sustainability](https://www.levi.com/US/en_US/features/sustainability).
- MIT (2013). The Benefits of Sustainability-Driven Innovation, *MIT Sloan Management Review*, Volume 54, No.2.
- Nielsen (2015). *The Sustainability Imperative: New Insights on Consumer Expectations*, Nielsen.
- NITI (2017). *Strategy on Resource Efficiency*, NITI Aayog, Government of India, New Delhi.
- Ozawa-Meida, L., Lemon, M. (2016). *Module on Resource Efficient Design*, De Montfort University, Leicester, UK.
- WVI (2017). <https://wasteventures.com/product.html>.
- YES-TERI (2018). *Circular Economy, A Business Imperative for India*, YES Bank Ltd and TERI, New Delhi.