

Example of waves of innovation in sustainability case study

[Education](#), [Sustainability](#)



- Introduction

At this stage in the world, innovation is necessary to attain prosperity and develop solutions that tackle the challenges of energy security and global warming. However, the process is not as easy as scientists make it appear. As a result, understanding the waves of innovation is necessary in order to appreciate the innovation cycle. The innovation cycle is best presented through the waves of innovation diagram, which consists of five waves that show different phases of industrial life cycle. This report makes an attempt to discuss the waves of innovation, and how this affects specific sectors of the industry.

- Discussion

The first wave describes the use of water power and machines. This is closely followed by the second wave (starting from 1845), which involves production of cotton and steel. The third wave (commencing in 1900) focuses on electricity, chemicals and production of automobiles. The fourth wave (beginning at around 1950) involves much progression in the fields of petrochemicals, space and aviation, and lastly, the fifth wave (starting at around 1990) involves the evolution of digital networks, growing focus on biochemistry, software and information technology.

The level of sophistication has increased over the years, and today, green automobiles are produced using hybrid technology. These steps not only save the environment, but also cut costs. As a result, several sectors (of the economy) have been forced to adjust. For example, electrical engines produced in the First World War were abandoned immediately after the war, as people shifted to combustion engines that had high performance.

However, electrical engines appeared again in the 1960-70s due to ecological problems.

Another outstanding example of the adjustments made due to sustainability demands is Lockheed's Building 157 located in Sunnyvale, California. The building was designed in the 1980s, with major focus on the extensive use of day lighting rather than artificial lighting. The innovative design of the building reduced energy requirements (for lighting) by around 75%, and significantly reduced the demand for air conditioning. Currently, total energy savings are estimated at \$500, 000 p. a, and Lockheed believes that further savings are made due to reduced absenteeism. Productivity gains of up to 15% were also reported. Other sustainable innovations have also been reported in other parts of the world. For example, the Royal Dutch Shell Company created a department of sustainability in the effort to minimize the environmental pressure on our planet while maintaining sustainability. Going by the results of a survey released in 2004, companies will have to accommodate sustainable development in their R&D programs because evidence demonstrates that financially sound companies outperform in sustainable development practices.

- Conclusion

Past experience in industrial revolution has provided the basis for green innovations; this means that all new generations of innovation should be based on nature. This can only be done by keeping in mind a green planet and sustainability in every undertaking. The good thing is that waves of innovation can be applied in adopting sustainable practices that protect environment, and avoid energy wastage. Through these lessons, the world

has a chance to make the planet green and preserve the natural environment.

- Appendices

Figure 1: Waves of innovation of the first and the next industrial revolution

Source: http://www.naturaledgeproject.net/ESSPCLP-Intro_to_SD-Lecture3.aspx

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