

The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect.

A Sustainable Innovation & Circular Economy Strategy

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Introduction

- ▶ A circular economy focuses on reducing wastage and pollution with repair, reuse and reduction
- ▶ In recent years, global sustainability has become one of the main focus areas for businesses and government
- ▶ Three areas of focus will be looked at:
 - ▶ Renewable Energy
 - ▶ Sustainable Transport
 - ▶ Recyclable Materials

Renewable Energy

- ▶ Renewable energy sources are continually restored by nature and derived directly or indirectly from the sun or other natural mechanisms of the environment
- ▶ Excludes resources derived from fossil fuels, waste products from fossil sources and waste products from inorganic sources
- ▶ Renewable energy is climate-neutral and resource saving
- ▶ Climate change due to greenhouse gas emissions from fossil fuels emissions
- ▶ Solar energy, wind energy, hydro energy, tidal energy, geothermal energy, biomass energy



Global Companies in Renewable Energy

Attracted by the future potential, several multinationals from developing and emerging markets have succeeded in becoming global players in the renewable energy sectors

Hanergy - China

- ▶ Thin-film solar power company
- ▶ Hydropower
- ▶ Wind power
- ▶ Branches in Americas, Europe, Middle East, Africa

EDF Renewables UK

- ▶ Wind power, Solar power
- ▶ Battery storage and EV power
- ▶ England, Ireland, Scotland, Wales

TrinaSolar - China

- ▶ PV solar panels for renewable energy
- ▶ USA, UK, Europe, Australia

Suzlon - India

- ▶ Wind power
- ▶ USA, Europe, Australia, China

Field of renewable energy has become global by nature, from the production of technology to the generation of energy

Global Companies Powered By Renewable Energy

Intel - USA

- ▶ Uses renewable power, generated from wind, solar, geothermal, low-impact hydro, and biomass sources

Apple - USA

- ▶ Uses renewable power itself and pushing their sources to target of 100% green energy by 2030

Microsoft - USA

- ▶ Greenest company - uses 1.3 billion kWh of green energy (solar and wind power)

Kohl's - USA

- ▶ 1,160 stores in 49 states, 1,001 are Energy Star-certified and 163 locations feature on-site solar panels
- ▶ Met that goal with net zero emissions from 2010-2014

Google - USA

- ▶ Carbon neutral since 2007
- ▶ Seeks new technologies for making green energy

British Telecom - UK

- ▶ Powered by 100% renewable energy worldwide

Government requirements

- ▶ China – Renewable Portfolio Standards. Minimum % requirement of renewable electricity used. National carbon-trading scheme. Green power trading.
- ▶ Indonesia – Renewable Energy Certificate. Achieve 35% renewable energy by 2030
- ▶ Vietnam – UN Climate Change phase out coal + become net-zero by 2060
- ▶ International Energy Agency:
 - ▶ Net-Zero by 2050 initiative
 - ▶ 30 member countries, 8 association countries
 - ▶ Identifies energy issues (oil, gas and coal supply and demand), renewable energy technologies, electricity markets, energy efficiency, access to energy and demand side management and much more
 - ▶ Advocates policies that will enhance the reliability, affordability and sustainability of energy in its 30 member countries, 8 association countries and beyond

Government requirements

- ▶ European Union – SET plan initiatives:
 - ▶ Wind Initiative
 - ▶ Solar Initiative
 - ▶ Bioenergy Initiative
 - ▶ CO2 capture, transport and storage
- ▶ Paris Agreement – 196 parties
- ▶ United Nations Framework Convention on Climate Change – 198 parties
- ▶ Kyoto Protocol – 192 parties



Sustainable Transport

- ▶ One of the leading causes of Greenhouse Gas Emissions and other pollutants
- ▶ Companies across the world are revolutionising their logistics in order to use less fuel while maintaining effective goods transport



North American Methods

- ▶ Many modern North American companies use services such as the Mobility-as-a-Service (MaaS).
- ▶ Allows for ride sharing which reduces the number of cars on the road.
- ▶ The scheme was introduced after a study found that 90% of all motor vehicles in North America were only idling while in use.
- ▶ Only 1.5 people on average in each car.
- ▶ Ride sharing would in theory reduce the number of cars needed by up to 50% in theory (Assuming cars have five seats)

Tyre Recycling and Reusage

- ▶ One of the often-forgotten parts of vehicles when it comes to waste and material usage.
- ▶ Companies across Europe such as Genan in Denmark have pushed for old tyre recycling and are now a market leader in Europe.
- ▶ 1 Billion tyres wear out each year globally, creating a huge need to tyre recycling.
- ▶ Out of the Billion, 65% are collected for re-use, of which 70% are then recycled and 30% are used for energy recovery.
- ▶ Tyre manufacturers such as Genan now offer innovative service packages which include maintenance and real time tyre condition monitoring. This allows tyres to become longer lasting and decreases resource utilization.

Freight

- ▶ The most important logistical system on the planet is the transportation of goods by freight.
- ▶ Includes shipping, air cargo and trucks.
- ▶ According to the National Bureau of Transportation, in 2019 a quarter of all truck fuel tanks ran empty in North America. In Europe, this figure is 27% and Asia 40%.
- ▶ This data suggests that trucks are often used for long journeys.
- ▶ Companies worldwide are trialling new innovative systems that will allow for 'route linking'. This will allow trucks to link up and exchange freight which allows the least distance possible to be travelled.

DHL Vans (Deutsche Post group)

- ▶ DHL plans to use mostly zero emission vans by 2030.
- ▶ They have collaborated with Ford to produce a new model of electric van.
- ▶ DHL are the leaders in using electric vans.
- ▶ Each vehicle that is switched from diesel to electric will reduce 5 to 10 tonnes of CO2 emissions per year.
- ▶ An example of a leading company pushing towards a circular economy

Recyclable Materials- The global aerospace companies which are using recyclable Materials.

- ▶ 1. Ford Motor Company: Ford Motor Company uses recycled plastic to create components for its cars, such as seat backs, armrests, and dashboard trim. Ford also uses recycled rubber for tires, and recycled glass for windshields.
- ▶ 2. Honda Motor Corporation: Honda is committed to developing and implementing sustainable and efficient recycling and reuse of materials. They take part in the circular economy by reusing materials such as steel, aluminum, and plastic in the production of new vehicles and products.
- ▶ 3. Toyota Motor Corporation: Toyota is dedicated to the recycling of materials and is one of the first automotive companies to use recycled materials in the production of their vehicles. Toyota uses recycled plastics and metals in the production of their vehicles, as well as recycled rubber for tires.
- ▶ 4. Volkswagen Group: Volkswagen Group has recently announced that it will be using recycled plastics for interior trim in its new models. They also use recycled aluminum and steel in the production of their vehicles.
- ▶ 5. BMW Group: BMW Group is committed to the circular economy and uses recycled materials such as plastic and aluminum in the production of its vehicles. BMW also uses recycled rubber for tires.

Recyclable Materials- The global aerospace companies which are using recyclable Materials.

- ▶ 6. Daimler AG: Daimler AG has implemented various sustainable practices in its production process, such as the use of recycled materials in the production of its vehicles. Daimler uses recycled plastics, metals, and rubber for its vehicles.
- ▶ 7. General Motors: General Motors is dedicated to the use of recycled materials in its production process. GM uses recycled plastics, metals, and rubber in the production of its vehicles.
- ▶ 8. Fiat Chrysler Automobiles: Fiat Chrysler Automobiles uses recycled materials in the production of its vehicles. They use recycled plastics, metals, and rubber for its vehicles.
- ▶ 9. Renault-Nissan Alliance: The Renault-Nissan Alliance is a leader in the circular economy and uses recycled materials in the production of its vehicles. They use recycled plastics, metals, and rubber for its vehicles.
- ▶ 10. Hyundai Motor Group: Hyundai Motor Group is dedicated to the circular economy and uses recycled materials in the production of its vehicles. They use recycled plastics, metals, and rubber for its vehicles.

The global aerospace companies which are using recyclable Materials.

- ▶ 1. Airbus: Airbus is actively involved in circular economy initiatives, such as investing in remanufacturing and reuse of materials. For example, the company has invested in a remanufacturing facility in Hamburg, Germany for its A320 aircraft which can remanufacture components such as wing flaps and landing gear from used parts.
- ▶ 2. Boeing: Boeing is also involved in circular economy initiatives, and is part of the Aerospace Industries Association's (AIA) Circular Economy Initiative. As part of the initiative, Boeing is focusing on reducing waste and creating a more sustainable aerospace industry by investing in sustainable materials, green manufacturing and eco-friendly design.
- ▶ 3. Lockheed Martin: Lockheed Martin has also committed to circular economy initiatives, such as reducing waste, improving energy efficiency and investing in sustainable materials. The company is also working on developing technologies to enable reuse of aerospace components and materials, such as 3D printing and additive manufacturing.
- ▶ 4. Bombardier: Bombardier is also involved in circular economy initiatives. The company is working on developing and testing sustainable materials and processes, such as using recycled aluminum in aircraft components and developing a process to reclaim used parts and components.
- ▶ 5. Rolls-Royce: Rolls-Royce is committed to circular economy initiatives, such as investing in green manufacturing and developing efficient processes for reuse of materials. The company is also researching new materials and processes for reuse of aerospace components, such as 3D printing and additive manufacturing.
- ▶ 6. Textron Aviation: Textron Aviation is working on circular economy initiatives, such as investing in sustainable materials and green manufacturing processes. The company is also researching new materials and processes for reuse of aerospace components, such as 3D printing and additive manufacturing.

Different automotive companies and the issues that they have previously faced to establish themselves internationally.

- ▶ Toyota: Toyota is one of the world's largest automotive manufacturers and has been successful in establishing itself as a global brand. Its international expansion began in 1968 when it opened its first overseas production plant in Brazil. Since then, Toyota has expanded its global presence to more than 170 countries and regions, including the United States, Europe, Southeast Asia, and Africa. Despite its success, Toyota has faced some issues over the years in establishing itself internationally.
- ▶ One of the biggest challenges the company has faced is dealing with the different regulations and standards in different countries. Toyota has had to make sure that its vehicles are compliant with the regulations and standards of each country and region it operates in, which can be costly and time consuming. Additionally, Toyota has had to contend with language and cultural barriers when operating in different countries, as well as adjusting to local tastes when it comes to design and features. Finally, the company has had to deal with high tariffs and other trade restrictions in some countries, which can make it difficult to be profitable.

Different automotive companies and the issues that they have previously faced to establish themselves internationally.

- ▶ **Volkswagen:** Volkswagen has long been one of the world's largest automotive companies, with a presence in more than 150 countries. The company has been successful in establishing itself in international markets, but it has had to face some issues in order to do so.
- ▶ One of the biggest issues Volkswagen has had to deal with is the perception of quality, as many people in some countries associate German cars with being expensive and unreliable. Additionally, Volkswagen has had to contend with different regulations and standards in different countries, as well as high tariffs and other trade restrictions in some countries. Finally, the company has had to adjust to local tastes when it comes to design and features, as well as language and cultural barriers when operating in different countries.
- ▶ **Ford:** Ford has been a global automotive brand for many years, and it has been successful in establishing itself in international markets. However, the company has faced some issues in its international expansion.
- ▶ One of the biggest challenges Ford has faced is dealing with different regulations and standards in different countries, as well as high tariffs and other trade restrictions in some countries. Additionally, the company has had to adjust to local tastes when it comes to design and features, as well as language and cultural barriers when operating in different countries. Finally, Ford has had to deal with the perception of quality, as some people in some countries still associate American cars with being unreliable.

The different automotive businesses and medical device development have different success in different countries or regions

- ▶ Different automotive businesses can have different levels of success in different countries or regions due to a variety of factors. These include the prevalence of different types of vehicles in different regions, the availability of parts and service centers, the strength of local economies, and the presence of government incentives or regulations that might favor or hinder certain businesses. Local cultural preferences and tastes can also influence the success of different automotive businesses. For example, some regions may prefer larger vehicles, while others may favor smaller models. Additionally, the strength of a brand and its reputation can make a difference in how successful a business is in a given region.
- ▶ The level of success for a medical device development company in a new market may depend on its ability to form strong partnerships with local healthcare providers and organizations. Companies must be able to demonstrate that their products are reliable and have a positive impact on patient care in order to gain the trust and support of local healthcare providers and organizations. Companies must also be prepared to invest time and resources into providing education and training to local healthcare providers and organizations in order to ensure that their products are being used properly and effectively.

What are the different country's government requirements on using recyclable material as circular economy

- ▶ Each country has its own government requirements on the use of recyclable materials as a way to promote circular economy. Generally, these requirements include the use of recycled materials in the production of new products, the development of an efficient waste management system, and the promotion of resource reuse and recycling.
- ▶ In the United States, the federal government requires companies to use a certain percentage of recycled materials in their products. The Environmental Protection Agency (EPA) has also created the Design for the Environment (DfE) program, which focuses on reducing the environmental impact of products by encouraging companies to use recycled materials in their production.
- ▶ In the European Union, the European Commission has implemented the Circular Economy Package, which focuses on reducing waste and promoting the use of recycled materials. This package includes measures such as the Waste Framework Directive, which sets targets for waste prevention and recycling, and the Packaging and Packaging Waste Directive, which sets targets for the reuse and recycling of packaging materials.
- ▶ In China, the government has implemented the Circular Economy Promotion Law, which promotes the development of a circular economy by encouraging the use of recycled materials and the reuse of resources. The law also requires companies to use recycled materials in the production of new products and to develop efficient waste management systems.
- ▶ In India, the government has implemented the National Policy on Plastic Waste Management, which encourages companies to use recycled materials in the production of new products. In addition, the government has implemented the Bio-Degradable and Recyclable Plastics Policy, which encourages the use of recycled materials in the production of packaging materials.
- ▶ Overall, each country has its own set of government regulations on using recyclable material as a way to promote circular economy. These regulations are designed to reduce waste and increase resource efficiency.

Sustainable innovation & A circular economy

- ▶ **Sustainable innovation** involves making intentional changes to a company's products, services, or processes to generate long-term social and environmental benefits while creating economic profits for the firm
- ▶ It is an approach to innovation that seeks to ensure that the economy is both economically and environmentally sustainable. This means that businesses need to consider the social and environmental impacts of their activities when developing new products, services and processes. As such, sustainable innovation is an approach that focuses on the development of solutions that are both financially and ecologically sustainable.
- ▶ **A circular economy** is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.
- ▶ It is a systemic approach to economic development designed to benefit businesses, society and the environment

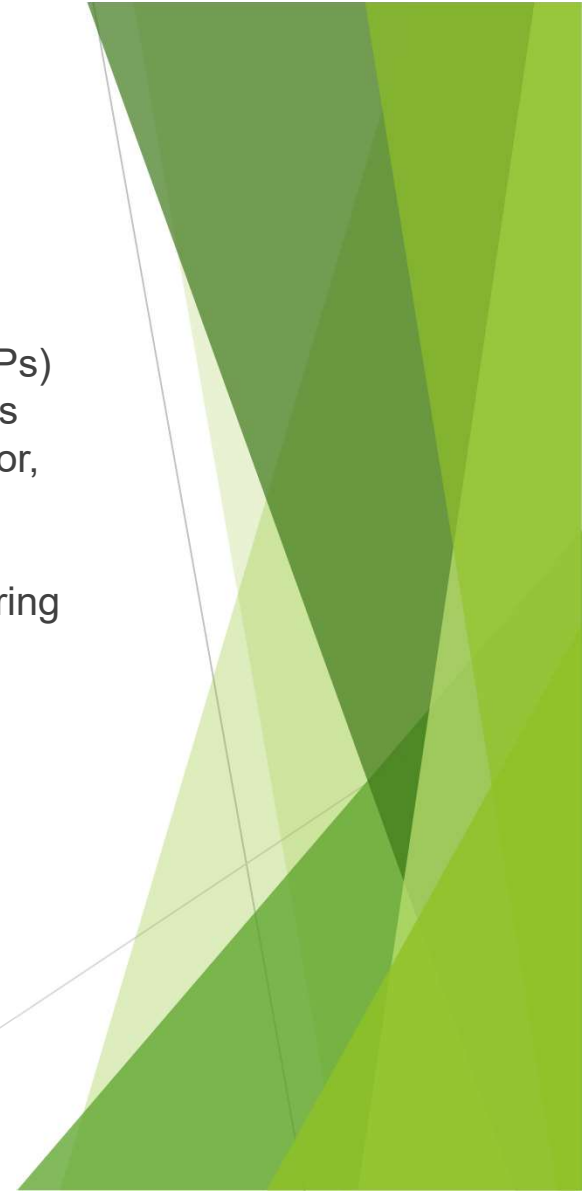
How the innovation is managed, from concept to delivery for circular economy and sustainability in different countries

- ▶ Innovation in circular economy and sustainability is managed differently across countries, due to varying levels of technology, resources, and market dynamics.
- ▶ In developed countries, the focus is on developing and implementing technologies that enable the implementation of circular economy and sustainability. In many cases, governments lead the charge in promoting the use of such technologies, providing incentives and grants to businesses that are willing to invest in such innovations. Private companies, universities, and research centers also play a role in engaging in research, development, and testing of circular economy and sustainability solutions.
- ▶ In developing countries, the focus is often on creating an enabling environment for innovation, such as through policy reforms, creating markets for circular economy and sustainability solutions, and providing capacity-building support. Governments and international organizations play an important role in providing technical and financial support for initiatives that promote circular economy and sustainability. The private sector also plays an important role in piloting, testing, and scaling up such solutions.



How the innovation is managed, from concept to delivery for circular economy and sustainability in different countries

- ▶ In both developed and developing countries, public-private partnerships (PPPs) are playing an increasingly important role in managing the innovation process from concept to delivery. PPPs involve collaboration between the public sector, private sector, and civil society to develop, implement, and scale up circular economy and sustainability solutions. They provide an important platform for sharing knowledge, resources, and expertise, and for pooling resources to bring about systemic change and create more sustainable societies.

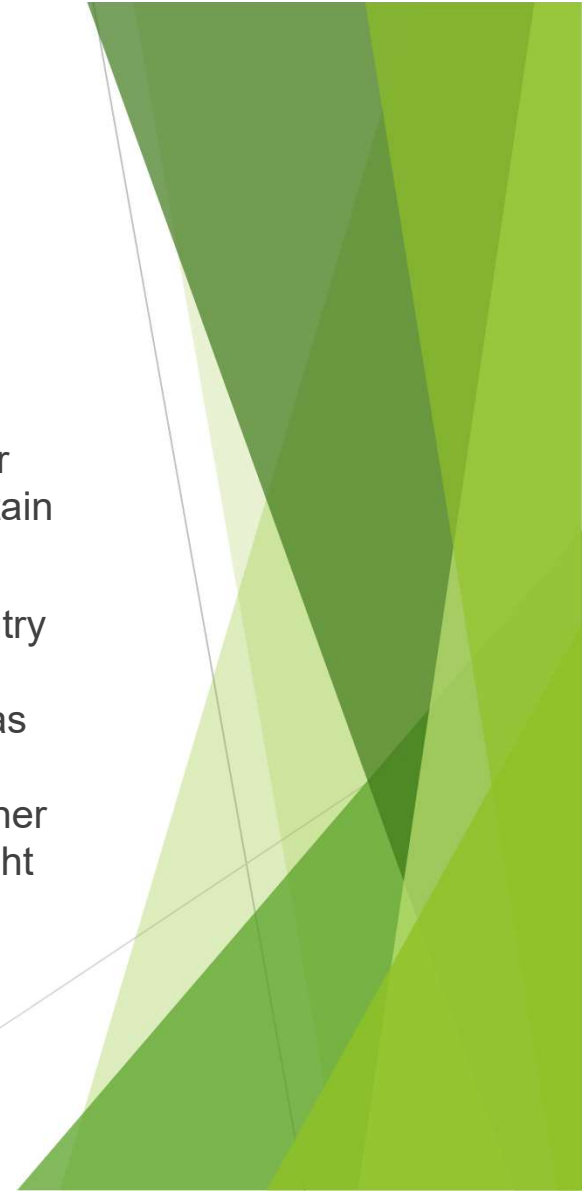


How the innovation is managed, from concept to delivery in different countries

- ▶ Innovation management, from concept to delivery, can vary significantly from country to country, depending on the particular culture, resources, and business environment of the region.
- ▶ In some countries, such as the United States, innovation is largely driven by the private sector, with companies taking the initiative in developing and launching new products, services, and processes.
- ▶ In other countries, such as China, the government often plays a more active role in driving innovation, providing resources and support to entrepreneurs and research projects.
- ▶ In the United States, the process of innovation management begins with a concept. Companies typically develop and refine ideas in-house, then submit them to venture capitalists and other funding sources for further evaluation. If the idea is deemed viable, it is then brought to market, with the company developing a prototype, conducting market research, and then launching a product or service.
- ▶ In China, the government plays a more active role in innovation management, providing resources and support to entrepreneurs, research projects, and businesses. The government often provides funding for projects, and may even take a stake in the venture. Once a project is approved, the government then provides resources and expertise to help with the development and launch of the concept.

How the innovation is managed, from concept to delivery in different countries

- ▶ In India, innovation management is a mix of both public and private sector roles. The government provides resources and funding for research and development projects, while individual entrepreneurs and businesses are responsible for launching and managing the products and services. The government also encourages collaboration between public and private sector stakeholders to promote innovation, and may even provide subsidies for certain projects.
- ▶ In Europe, the approach to innovation management tends to differ from country to country. In some nations, such as France and Germany, the government plays a more active role in driving innovation, while in other countries, such as the UK, private sector companies take the lead. In any case, the concept is typically developed and refined in-house, then presented to investors and other stakeholders for further evaluation. Once approved, the project is then brought to market, with the company responsible for developing and launching the product or service.



The common factors that businesses face in today's world to establish themselves internationally in terms sustainability and circular economy , and how they can seek to overcome these difficulties.

- ▶ 1. Access to capital and resources: To overcome this, businesses should look into alternative financing options such as crowd funding and angel investors, as well as government subsidies and grants. They should also look into ways to leverage existing resources, such as renewable energy sources, or explore partnerships with larger companies who have the necessary resources.
- ▶ 2. Regulatory framework: To overcome this, businesses should look into the various international standards and regulations in place, such as the United Nations Global Compact, and research the local regulations in the countries they are looking to enter.
- ▶ 3. Lack of knowledge and experience: To overcome this, businesses should look into hiring experienced personnel, or consulting with experts in the field to better understand the process. Additionally, businesses should look into educational opportunities such as workshops and seminars, to build their knowledge and skills in this area.
- ▶ 4. Competition: Establishing a business internationally means competing with existing companies, which can be daunting for new businesses. To overcome this, businesses should look into ways to differentiate themselves from competitors, such as offering unique services or products, or leveraging existing relationships with customers and suppliers. Additionally, businesses should look into creating a strong brand identity, as this can help them stand out from the competition.

Other factors that businesses face in today's world to establish themselves internationally in terms sustainability and circular economy.

- ▶ 1. Financial Resources: Businesses need access to the capital and resources necessary to establish an international presence. This may require them to take on debt or to seek out investors.
- ▶ 2. Regulatory Compliance: Businesses need to understand and comply with the laws and regulations of their target market. This can be a major challenge, as laws and regulations can differ between countries and regions.
- ▶ 3. Cultural Understanding: Businesses need to understand and be sensitive to the cultural norms of their target market. This requires a deep understanding of the local culture, as well as the ability to adjust their approach to meet the needs of the local market.
- ▶ 4. Environmental Impact: Businesses need to take into consideration the environmental impact of their operations, and seek out sustainable solutions whenever possible. This may include investing in renewable energy sources, reducing their carbon footprint, and creating products and services that are designed with sustainability in mind.
- ▶ 5. Circular Economy: Businesses need to understand and embrace the concept of the circular economy. This includes designing products and services with longevity in mind, as well as designing them with recyclability and reuse in mind.
- ▶ 6. Innovative Strategies: Businesses need to be able to come up with innovative strategies to stay competitive in the international market. This includes utilizing the latest technology, developing new products and services, and utilizing digital tools to reach new customers.
- ▶ 7. Risk Management, competition: Businesses need to have a robust risk management system in place in order to mitigate any potential risks associated with entering a new market. This includes developing strategies to hedge against currency fluctuations, political instability, and other potential risks.

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