



DELHI SCHOOL OF BUSINESS

By Vivekananda Institute of Professional Studies - TC

Delhi School of Business

PGDM Program

TERM – III (Batch: 2023-25)

END-TERM EXAMINATIONS

April 2024

Course Name	Sustainability, Responsible Business & Corporate Social Responsibility	Course Code	SRB & CSR
Duration	2.5 Hours	Max. Marks	40

Instructions:

1. Please attempt all parts of questions together.
2. All the questions along with their sub parts should be marked correctly.
3. Please write in clean & legible handwriting.

Q.1 Analyse the case “creating value from Waste: Lessons from Mahindra and Mahindra”.
(4 Marks each) CO_____

- 1) Why did M&M want to reduce waste?
- 2) What are the abilities & resources required to achieve a zero-waste factory?
- 3) How M&M was able to manage its waste?
- 4) What is circular economy? How does it help to achieve waste management by M&M?
- 5) What are the challenges in achieving waste management in your home?

Q2. Write short notes on any four of the followings: (5 marks each) CO_____

- ✓(1) CSR in India: Is it more a compliance than a business strategy? How do you view it? Explain.
- ✓(2) Net Zero Commitments
- (3) Poverty in India - Issues & Challenges
- ✓(4) Carbon Border Adjustments Tax
- (5) Sustainable Finance
- ✓(6) Business Responsibility & Sustainability Reporting- as required by SEBI in India.

CREATING VALUE FROM WASTE: LESSONS FROM MAHINDRA AND MAHINDRA

Professors Subhasis Ray and Pratima Bansal wrote this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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It was January, 2017. Nasir Deshmukh, general manager and head of Mahindra and Mahindra Limited (M&M)'s Igatpuri plant, was looking forward to hearing from the Mahindra Group's sustainability team about the advances and process changes his plant would need to make in order to receive zero-waste-to-landfill (ZWL) certification from Intertek Testing Services NA, Inc. The certification, which would require M&M's factories to divert more than 99 per cent of their waste from landfills, would bring the plant recognition as the first factory in India to meet this criterion.

Deshmukh knew there would be challenges in reducing his plant's contribution to landfills to zero. The company would need to view waste differently if it were to be successful. For example, there was the simple issue of the factory workers' use of white cotton gloves during manufacturing. While the gloves had traditionally been disposed of after every use, one recommendation the company had pursued was to simply wash and reuse them; however, the workers were not happy about reusing stained gloves. Deshmukh worried, if his workers had trouble moving forward on this seemingly simple issue, how was he going to deal with the massive amount of waste coming out of the automotive plant? ¹

MAHINDRA AND MAHINDRA LIMITED

The US\$20.7-billion¹ Mahindra Group (see Exhibit 1) was established as Mahindra and Mohammed in 1945 by two brothers, J.C. and K.C. Mahindra, and their friend Ghulam Mohammed. Both Mahindra brothers left lucrative careers to start the company. When Mohammed, one of the founders, migrated to Pakistan after the partition of India in 1947, the company was renamed Mahindra and Mahindra. By 2019, the group operated in more than 100 countries and had over 240,000 employees. It manufactured products and provided services in 11 sectors and 22 industries (see Exhibit 2) and operated in over 150 companies. With 55 manufacturing facilities and 10 research and development centres around the world, M&M was truly global in its operations. Its group companies were among the leaders in many sectors (see Exhibit 3).

M&M considered the banyan tree as a metaphor for its business (see Exhibit 4), which, like the tree itself, stood for values such as accepting no limits, adopting unconventional and alternative thinking, creating

¹ All dollar amounts are in US\$.

positive change, and adhering to its core values. The iconic Willys Jeep was the first product the company sold on the Indian subcontinent. Other products included light commercial vehicles and tractors.

Innovation played a key role in the Mahindra Group's strategy to become a global top-50 brand by 2021 (see Exhibit 5). It had coined the term *FUTURise* (see Exhibit 6)—combining the words *future* and its corporate slogan, *Rise*—to signify how the company would innovate to “bring in the future” by accepting no limits and thinking differently. Innovations drove several of the group's business sectors: mobility (e.g., electric cars and e-racing); urbanization (e.g., smart cities and renewable energy); farming technology (e.g., a rental model and fruit-picking robots); and information technology (e.g., an analytics platform for energy access and analytics for car pricing). M&M's innovation was powered by three guiding principles: (1) doing more with less, (2) doing it together, and (3) doing it for all. Its innovation capability was recognized by the TIME India Awards 2017, which named the group as Innovator for the Year (see Exhibit 3).

INDIAN AUTOMOBILE INDUSTRY

The Indian automobile industry employed 37 million people and contributed 7.5 per cent to India's gross domestic product. However, the ways that Indians bought, owned, or used their cars were being reshaped by a number of factors, including changing demographics and lifestyles, concerns over pollution, traffic congestion, longer commutes, steep parking fees, new metro rail lines in eight cities, and the development of new app-based mobility solutions. Many people were opting out of car ownership, and the sector was facing a 17 per cent year-over-year sales decline in April 2019. Industry-specific challenges, frequent policy changes, macro-economic factors, and poor consumer sentiments were among the factors that had affected sales. Among the industry-specific factors was the Indian government's decision to leapfrog from Bharat stage (BS)-IV to BS-VI emission standards by April 1, 2020,² and to require 100-per-cent electric vehicles by 2030.³

M&M'S LEADERSHIP IN AUTOMOTIVE SUSTAINABILITY

Mahindra and Mahindra Limited (M&M), the automotive division of the Mahindra Group, was India's fourth-largest vehicle manufacturer. The Mumbai-based auto major was at the forefront of the electric vehicle segment in the country. Mahindra Electric, a part of the diversified Mahindra Group, manufactured electric vehicles such as the e-Verito sedan, the e-Supro van, the e2oPlus compact car, and the Treo three-wheeler—in addition to working on electric powertrains with a longer range.

Mahindra MSTC Recycling Pvt. Ltd., a joint venture between the Mahindra Group and the state-owned MSTC Ltd., was established in 2018 and planned to set up 30 end-of-life vehicle recycling plants by 2022. The Indian government planned to incentivise the adoption of vehicle scrappage policies with the help of reduced tax rates, purchase price discounts, and simplified compliance processes. M&M reaffirmed its commitment to cleaner vehicles by planning to invest over \$140 million in such products by 2022.

M&M'S COMMITMENT TO SUSTAINABILITY AND CORPORATE SOCIAL RESPONSIBILITY

M&M had a long history of corporate social responsibility (CSR) and of considering the needs of the environment and other stakeholders (see Exhibit 7). Although the company's CSR activities could be traced

² Somesh Jha, “Govt. to Implement BS-VI Norms by 2020,” *The Hindu*, January 6, 2016, accessed May 19, 2020, www.thehindu.com/business/Govt.-to-implement-BS-VI-norms-by-2020/article13984521.ece.

³ “India Turns to Electric Vehicles to Beat Pollution,” BBC, July 24, 2019, accessed May 19, 2020, www.bbc.com/news/world-asia-india-48961525.

back to the 1970s, sustainability found a place in its corporate documents in 2008. In 2019, the company claimed that sustainability was being embedded at the strategic, managerial, and operational levels. At the global level, Anand Mahindra represented the corporate world at the Paris Climate Agreement signing ceremony in 2016. Since 2010, the group's activities in support of sustainability had included an employee volunteer program and a focus on reducing greenhouse gas emissions in its operations, with an average reduction of 40 per cent.

The Mahindra Group had achieved water-positive status (i.e., it had created or captured more water than it had used) in 2014, and it was the first Indian company to fix an internal carbon price of \$10. Many group businesses were focused on building green operations: solar energy, steel recycling, electric vehicles, and micro irrigation contributed \$480 million in revenue to the company. In assessing its 10-year sustainability journey, the company was convinced that "climate change is the biggest business opportunity in this century."

As the solar energy business continued to grow, Mahindra Finance made strides in financial inclusion by offering loans to unemployed youth and traders who could not get loans from banks. Across several communities, the company also provided educational opportunities to close to 300,000 girls from economically disadvantaged families through its Project *Nanhi-Kali* ("little buds" in Hindi). It provided skills development for Indian youth through vocational training and had also offered grants that supported women interested in agriculture.

WASTE MANAGEMENT: ZERO WASTE TO LANDFILL (ZWL)

M&M considered the ZWL certification to be a great example of its environmental stewardship and commitment to sustainability. The company had a long history of responsible and clean manufacturing, and it considered waste management an important part of its operations. Although some efforts had been made since 2015 toward identifying the best practices to adopt on waste management, it was in 2017 that the initiative gained momentum under the leadership of the chief sustainability officer, Anirban Ghosh. His focus on this work was motivated by recurrent fires at the Deonar dumping ground in Mumbai, which had caused health issues for the residents of the Chembur, Govandi, and Mankhurd neighbourhoods. The fires at the dump had caused conditions that made the adjacent area unfit for habitation. Ghosh was looking for solutions that would ensure that none of the company's waste landed in dumping grounds like Deonar.

The corporate sustainability group spent a few months looking at the available options and finally zeroed in on ZWL, an internationally recognized waste management system. Since the group's automotive division was the largest in terms of revenue share, the group decided to implement the first ZWL system at M&M's Igatpuri plant. This was where some of India's best-selling sports utility vehicles, such as the Scorpio and Bolero, were manufactured. There was a general consensus that ZWL would require M&M to completely rethink its waste generation and disposal.

Waste Categories

M&M's long-term focus on waste management ensured that, by 2016, only 2 per cent of the Igatpuri factory waste (approximately 50 tonnes), which was largely hazardous, was being sent to a landfill. The waste produced by the factory could be further categorized into production waste, which was largely hazardous (see Exhibit 8), and non-production waste (see Exhibit 9). Hazardous and non-hazardous waste was produced both during production and from other sources, such as the office cafeteria and clinics (see Exhibit 9).

Production-Related Waste

Each part of the engine production process generated both hazardous and non-hazardous waste.

Non-hazardous production waste included packaging scrap, wooden pallets, rejected engine parts, and fine materials left over from the process of boring parts. Hazardous waste from this process included used oil, grinding mud, and oil-soaked cotton. Sludge obtained from the Central Treatment Plant at this stage was also treated as hazardous waste. Once machining was done, the parts were sent to the engine assembly plant, where hazardous waste again included used oil, oily filters, and oil-soaked cotton in addition to empty tins and drums. Treated oil and sludge went to the effluent treatment plant. Igatpuri plant management realized that reducing the production of hazardous waste was critical to maintaining the plant's ZWL certification.

An Example of Production Waste: Camshaft Grinding Waste

Camshafts, an integral part of modern internal combustion engines, improved the cruising efficiency of cars. The waste generated during the grinding of camshafts, known as grinding mud waste, contained heavy metals such as cadmium, which was toxic to humans and which the regulator, the Maharashtra State Pollution Control Board, considered to be hazardous to the environment. M&M disposed of around 50 tonnes of such waste annually through a specialized agency, Maharashtra Enviro Power Ltd., which ensured that this waste went to an approved hazardous waste facility.

M&M tried several innovations for reusing this waste. Initially, it experimented with making paver blocks (used for making pavement) by grinding mud waste; however, this did not work, as the blocks did not have the strength required of such construction materials. Next, it attempted to use the mud, along with bitumen, for road construction. This experiment also failed, as the bonding between the bitumen and mud was not sufficient. Supply chain head Shekhar Karanjikar's next innovation was to use the grinding mud as an ingredient in the red clay bricks that were widely used in construction. While the bricks made with this waste met the required strength standards for traditional bricks, the local pollution control authority did not allow the new bricks to be used in construction. The team persisted, and in a fourth innovation worked to use the grinding mud waste as a baking media in the production process. Although the trial succeeded, it was felt that there was not enough volume of waste generated to go ahead with this solution.

M&M's focus now shifted to recovering as much value from the waste as possible. It started using gunny bags at the point where mud was generated in order to reduce the proportion of coolant (i.e., chemicals used to reduce the heat generated during grinding) in the waste material. Magnetic separators were used to attract the ferrous materials, and the remaining materials were collected in bags so that the collected liquid could be reused. When none of these innovations showed promise, the company finally decided to take the help of external agencies to see if a better solution was possible. Alchemist Oil Pvt. Ltd, a Pune-based company, was brought in to recycle the waste material and to recover its metal, oil, and carbon black (a costly raw material). This step received the final approval of the local regulatory body, the Maharashtra Pollution Control Board.

Non-Production Waste

Non-production-related waste included office waste (e.g., paper, plastic, and broken glasses); waste from utilities (e.g., oil from generator sets and batteries); cafeteria waste (e.g., paper, plastic, utensils, and food waste); waste from the dispensary (e.g., paper, plastic, glass, and biomedical waste); and waste from the garden on the factory premises. Some of these materials were hazardous and others were non-hazardous.

Non-hazardous wastes were dealt with according to the 5R approach: reduce, reuse, recycle, refuse, and rotten. Using this approach, employees would first try to *reduce* waste generation at the source. They then tried to *reuse* waste through innovative means. What could not be reused was *recycled* for use in other applications. Waste that could not be recycled was *refused* and had to be disposed of. Finally, *rotten* waste had to be sent to a landfill.

Much of the metal and plastic non-hazardous waste was reused to make small pieces of furniture for the factory premises. For example, scrap tires were used to beautify the factory premises by creating aesthetic fencing around the waste-water pond. While non-hazardous waste was relatively easy to recycle and reuse, hazardous wastes were governed by several rules and regulations, making it difficult for M&M to devise ways of reducing or disposing of them.

An Example of Non-Production Waste: Packaging

Packaging was one area that generated a large amount of waste. Parts of car engines were shipped in wooden or cardboard boxes. M&M had replaced its traditional packaging with recyclable packaging, in collaboration with the US company Chep (www.chep.com), which provided sustainable packaging solutions, and it also asked its suppliers to use Chep products (i.e., recyclable packaging pellets), as this would lead to long-term cost savings for both M&M and the suppliers. The move to sustainable packaging started before the ZWL decision was made, but it fit well into the ZWL process. Wooden packaging, which had been used for certain engine parts, was now replaced with recyclable packaging, and some requisition processes in the materials management department were redesigned to reduce the use of paper. For example, approvals for supplier requisitions were now sent via mobile phones, and packaging used for gaskets (the mechanical seals used to prevent leakage) was reused for printing, saving 11,100 sheets in the procurement process.

MAHINDRA SUSTAINABILITY FRAMEWORK

ZWL was not a one-off sustainability initiative at M&M; rather, it had been triggered by the group chief executive officer Anand Mahindra's clear vision of embedding sustainability as a core business strategy for the company (see Exhibit 7). Implementing ZWL required a complete review of the types of waste generated in the plant and required the company to rethink how to manage this to reduce diversion of waste to the landfill. The journey to ZWL could be divided into several steps: (1) implementing a ZWL policy for the plant; (2) documenting management process and procedures; (3) initiating a management information system to demonstrate quantification of waste; and (4) creating a tracking system for the waste, shipping records, and other waste-handling and disposal information. The company strove to recover value from the waste produced in the factory through several initiatives, together identified as Waste to Wealth. These included installing a heat recovery system that used heat generated at the engine testing facility, installing a bio-gas plant at the canteen, reusing canteen waste water for gardening, and creating compost manuring pits. The ZWL system was monitored for progress and included in the company's internal audit process. As an indication of the seriousness M&M accorded to sustainability initiatives, the ZWL system was also made part of the management review meeting.

CHANGING MINDSETS FOR CHANGING GLOVES?

The cotton gloves used in the production process at the M&M factory posed a challenge for the ZWL team. The usual practice was to issue new, white cotton gloves to workers on the production line, who disposed of the gloves after their shifts were over. As the used gloves constituted a significant portion of the hazardous waste

from the production process, the ZWL team tried washing used gloves and encouraging workers to reuse them, but employees refused to use old gloves, and the management had no option but to issue new gloves.

The cotton-gloves issue—a metaphor for larger waste-related issues in the factory—was at the front of the waste management issue. M&M factory management needed to find innovative solutions and change employees' behaviour. Since the ZWL certification complemented Anand Mahindra's call to integrate sustainability into every aspect of business operations and strategy, what was needed was not just a reduction of the waste related to cotton gloves but also a change to the corporate culture itself.

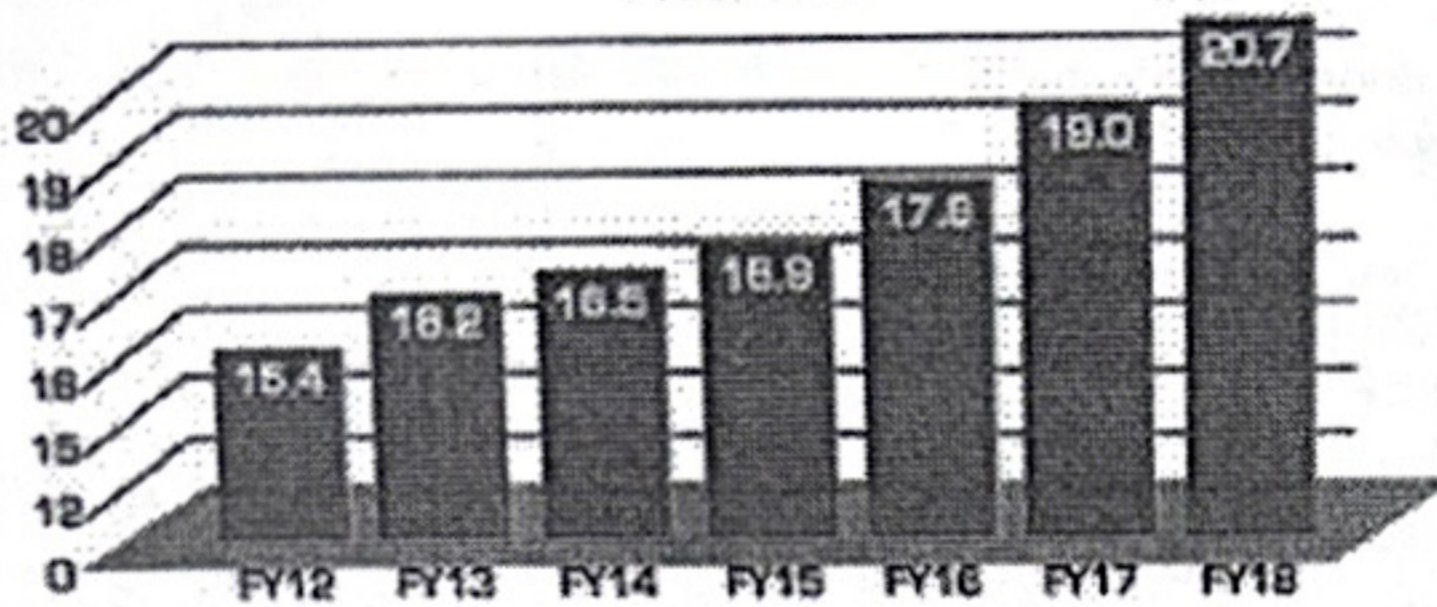
THE ROAD AHEAD

Deshmukh was confident that by March 2020 the factory could achieve a 99.84-per-cent landfill diversion rate—i.e., that it could send only 0.16 per cent of the total waste generated at one of the most important M&M factories to the landfill. More importantly, the ZWL process would result in several other benefits, including material savings, cost reduction, waste upcycling, and a great boost to M&M's brand equity as a sustainability-focused global brand. The ZWL process led not only to efficiency and improvements in the manufacturing process but also to savings of physical and financial resources through circular-economy thinking. However, two challenges remained: First, how could the company address issues like the shop floor employees' refusal to reuse cotton gloves? Second, how could it embed waste management into the factory processes? If the Igatpuri ZWL initiative were successful, similar initiatives might be rolled out in other Mahindra Group automotive plants and, finally, in all M&M facilities. Some of the other M&M plants in India had requested support from the corporate sustainability team in attaining their own ZWL certifications. As Deshmukh headed to the all-important meeting, he wondered what would be the best way to go forward with ZWL.

EXHIBIT 1: MAHINDRA AND MAHINDRA REVENUE CHARTS

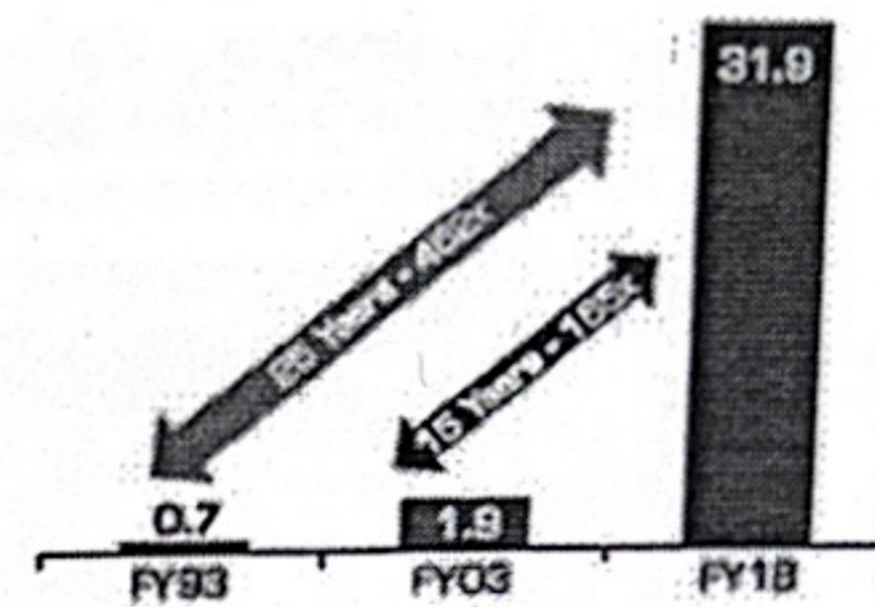
Mahindra Group Revenue*

(in US\$ Bn)

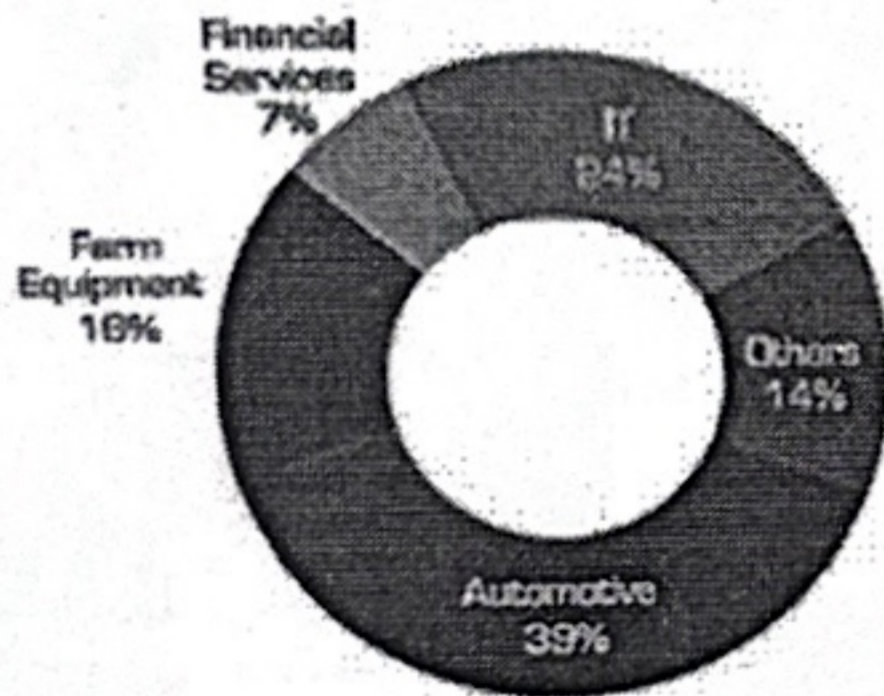


Mahindra Group Market Capitalisation**

(in US\$ Bn)

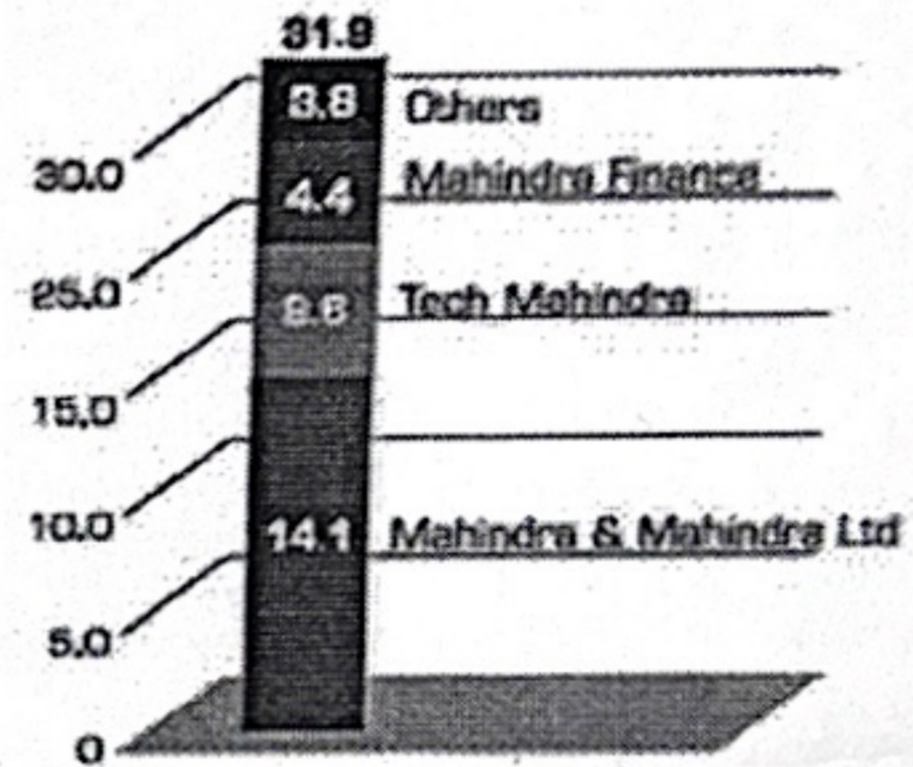


Group Revenue Split FY18*



FY 18 has been a tremendous year for all of us at Mahindra. The secular growth despite environmental volatility, has helped us generate the highest revenue as a group

Group Market Capitalisation Split FY18**



*This is a full summation of Gross Revenues and other income of all the Mahindra group companies taken together for FY18

**Market capitalisation values are calculated as per the US\$ exchange rates of the last day of every financial year

Source: Company documents.

EXHIBIT 2: MAHINDRA AND MAHINDRA'S LEADING POSITION IN SEVERAL SECTORS

BUILDING THE PRESENT. RESHAPING THE FUTURE.

Our operations in key industries form the foundation of every modern economy. We're empowering enterprises across sectors and borders, with tools that will drive them towards growth.

AEROSPACE & DEFENCE
AFTERMARKET
AGRI BUSINESS
AUTOMOTIVE
FARM EQUIPMENT
FINANCIAL SERVICES
HOSPITALITY
INFORMATION TECHNOLOGY
PARTNERS
REAL ESTATE
TWO WHEELERS

11 SECTORS	22 INDUSTRIES	150+ COMPANIES
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UNITED BY ONE PURPOSE.
TO ENABLE PEOPLE TO RISE.

Source: Company documents.

EXHIBIT 3: MAHINDRA AND MAHINDRA'S RECENT ACCOLADES, 2017-2018

- 23rd on the Fortune Change the World List, 2018
- Five Mahindra Group companies among "India's Best Companies to Work For", Great Place to Work Institute, 2018
- Mahindra Farm Equipment recognized for "Creating Shared Value for Farming Community" GNFC Porter Prize, 2018
- Tech Mahindra, a Mahindra company awarded "Best Company for CSR", HYSEA, 2018
- M&M awarded "Innovator of the Year," TIME India Awards, 2017
- Mahindra awarded "8th Best Indian Brand" by Interbrand, 2017
- M&M awarded "Corporate Citizen of the Year", *Economic Times* Award, 2017
- Six Mahindra factories awarded "CII National Award for Excellence in Energy & Water Management" by National Energy Efficiency Circle Competition, 2017

Note: CSR = corporate social responsibility; HYSEA = Hyderabad Software Enterprises Association
Source: Adopted by the authors from company documents.

EXHIBIT 4: MAHINDRA AND MAHINDRA'S CORE PURPOSE

THE BANYAN TREE is a metaphor for not just our business model, but also for who we are and what we stand for:

ACCEPTING NO LIMITS

Like the branches that spread infinitely, we surpass boundaries in achieving our Core Purpose.

ALTERNATIVE THINKING

We do this by thinking alternatively and being unconventional in our approach, like the aerial roots that extend from the branches to the ground, instead of growing underground as usual.

DRIVING POSITIVE CHANGE

As a result, our endeavours help us positively impact all our stakeholders, just like the Banyan tree that provides shade to everyone.

GOVERNANCE

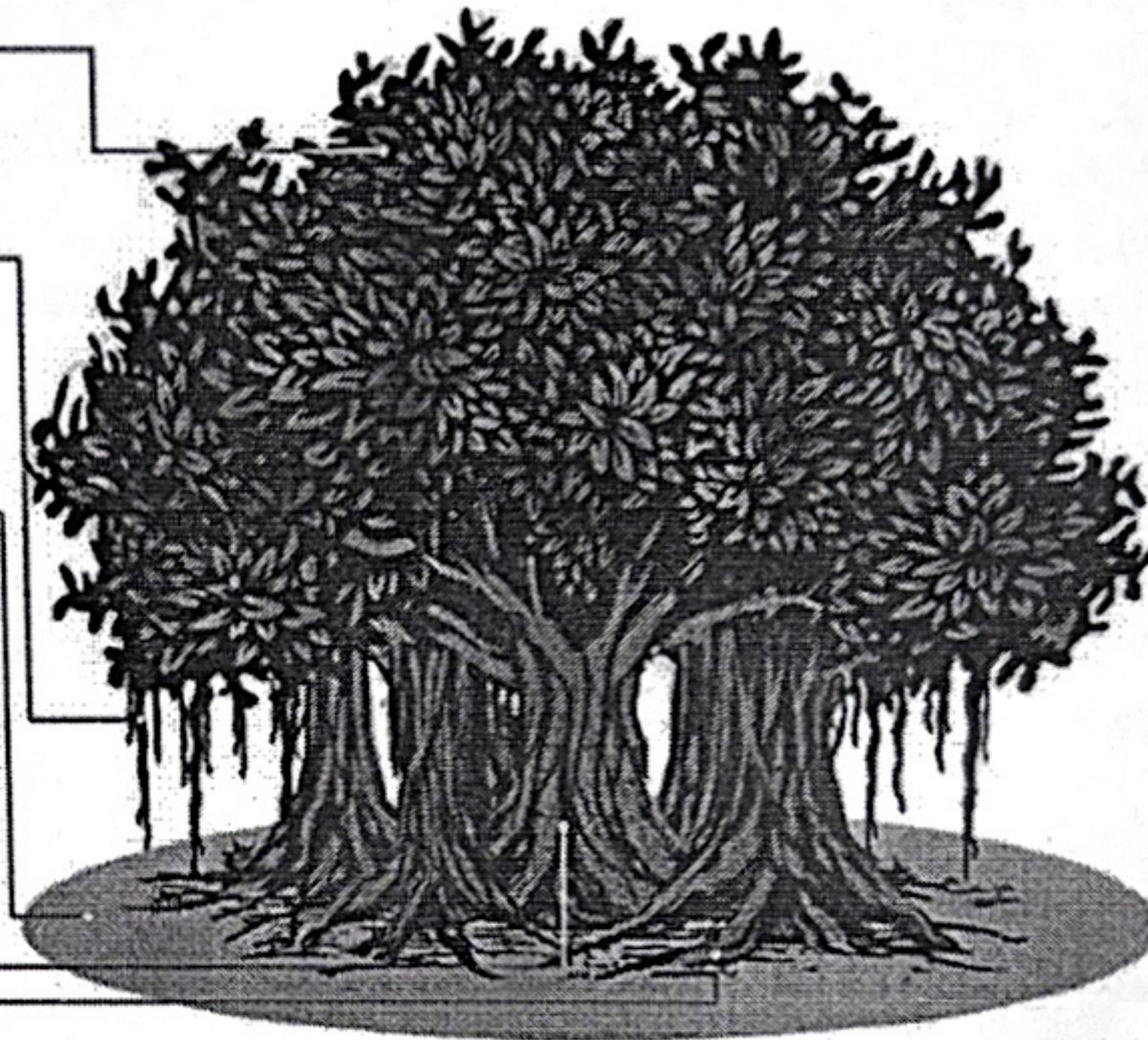
All of this is made possible through our governance, which is our core strength, just like the trunk is to the tree.

CORE VALUES

Professionalism, Good Corporate Citizenship, Customer First, Quality Focus, and Dignity of the Individual lie at the core of our ethos. These are our roots that nourish us.

OUR CORE PURPOSE

We will challenge conventional thinking and innovatively use all our resources to drive positive change in the lives of our stakeholders and communities across the world, to enable them to Rise.



03

Source: Company documents.

EXHIBIT 5: MAHINDRA AND MAHINDRA'S VISION STATEMENT AND KEY BRAND MESSAGES

Vision

By 2021, we aspire to be among the 50 most admired brands in the world. With an inspiring history, an unshakable set of values, and a clear sense of purpose, we aspire to reach our goal by enabling people everywhere to Rise.

Key Brand Messages

1. Innovative—With an ambition to achieve whatever we set our minds to, and to drive positive change, we bank on innovative use of all our resources.
2. Global—Since our genesis, we've been growing presence across the world through partnerships, a diverse and multi-national workforce, and by integrating ourselves with global communities.
3. Cares—From shaping change in the lives of our customers, to helping build communities that we are part of, to nurturing the planet, in everything we do, we strive to do good.

Source: Company documents.

EXHIBIT 6: INNOVATION AT MAHINDRA AND MAHINDRA

Mobility

Mahindra Electric is India's pioneer in electric vehicle (EV) technology and the only Original Equipment Manufacturer (OEM) with the largest deployed fleet of EVs. *Mahindra Racing* is working on the Formula E, the EV racing series that acts as a catalyst to new research and development.

Urbanization

Mahindra World Cities is one of India's top real estate developers that transform cities to integrated hubs for smarter living. *Mahindra Susten* is a leading player in India's solar energy space creating smart and sustainable solution for renewable energy.

Farm Tech

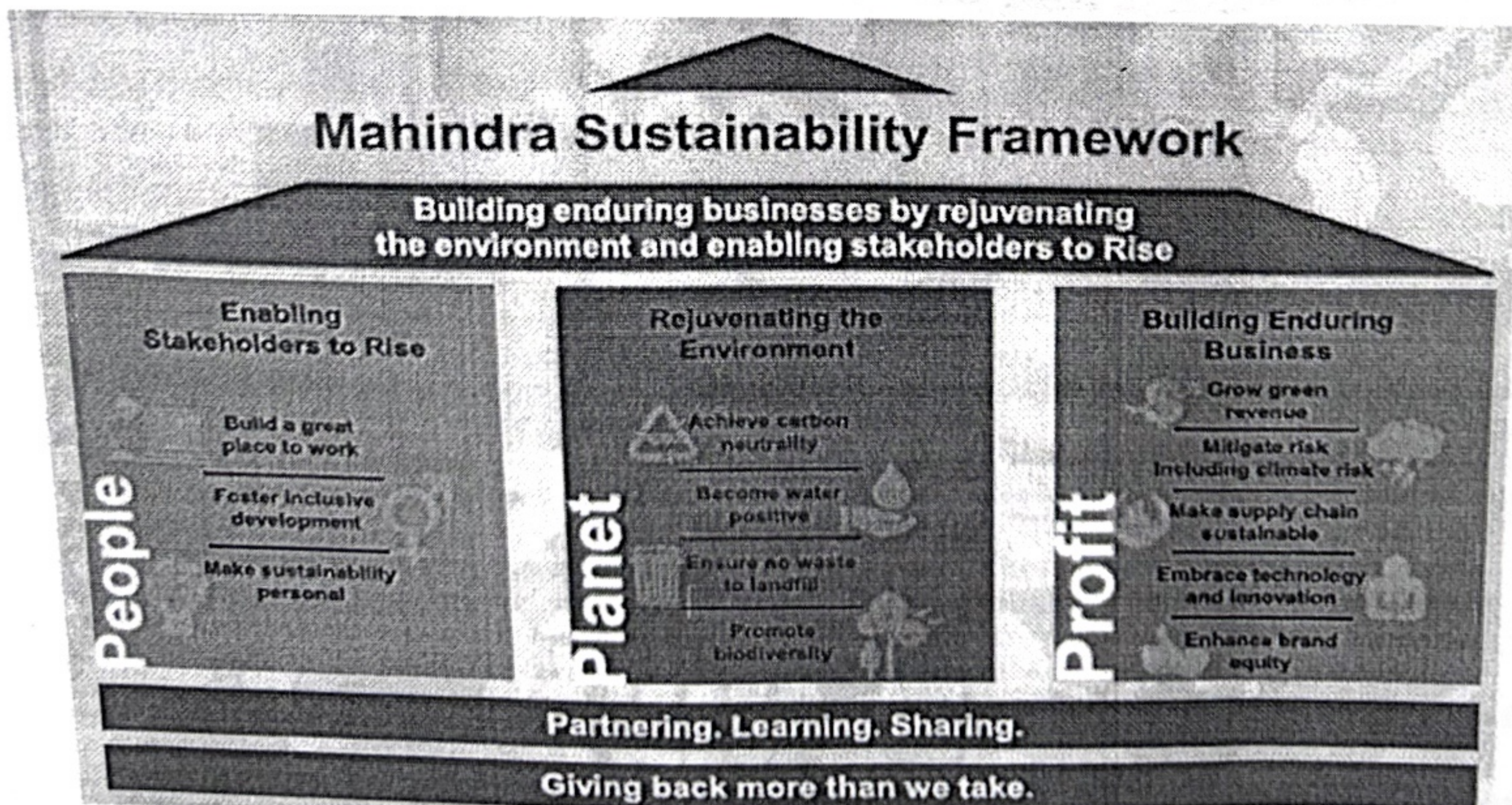
Trringo is India's first tractor and farm equipment rental business, making farm technology more accessible to the Indian farmer. *Mahindra AgTech Centre* at Virginia Tech, United States, advances farm mechanization by introducing new technologies like fruit-picking robots.

Information Technology

Mahindra-funded *Community Action Platform for Energy* developed an advanced analytics platform to make energy cheaper and more sustainable in the city of Milton Keynes, United Kingdom. The *Indian Blue Book* project used an analytic engine to logically deduce an accurate pricing index useful for deriving benchmark market prices for vehicles.

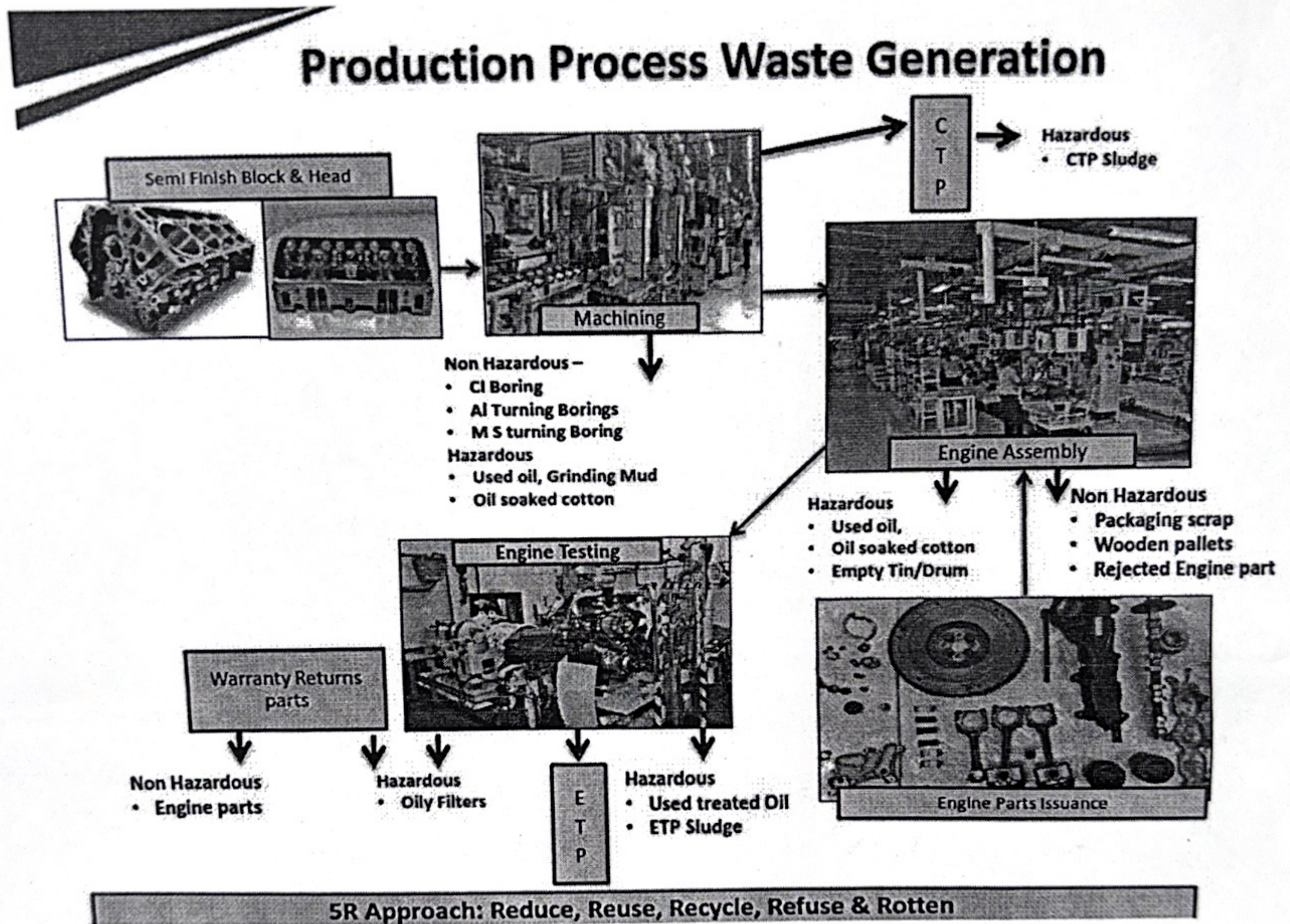
Source: Adopted by the authors from company documents.

EXHIBIT 7: MAHINDRA AND MAHINDRA—SUSTAINABILITY FRAMEWORK



Source: Company documents.

EXHIBIT 8: PRODUCTION PROCESS WASTE GENERATION



Notes: CI = cast iron; AI = aluminium; MS = mild steel; CTP = coolant treatment plant; ETP = effluent treatment plant
 Source: Company documents.

EXHIBIT 9: NON-PRODUCTION PROCESS WASTE GENERATION

Source	Hazardous Waste	Non-hazardous Waste
Office	E-waste	Paper, plastic, broken glass
Utilities	Waste oil from generator, batteries	
Canteen		Paper, plastic, utensils, food waste
Clinic	Bio-medical	Paper, plastic, glass
Factory Garden		Sweeping waste, leaves

Source: Company documents.