BlueYonder

Inter IIT Tech Meet 10.0

Sustainable Supply Chain Management Case Study

Submitted By:

Team 17

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Problem Statement

You must lay out a 5-year plan to improve the sustainability of the NAWCI members' supply chains and achieve significant carbon footprint reduction. The plan must act within real-life constraints like technological limitations and be supported by relevant data. The proposals should provide measurable profitability, actionable initiatives and quantifiable benefits.

Existing Supply Chain

Big Players:

Nestle

Unilever

ITC Limited

Dabur

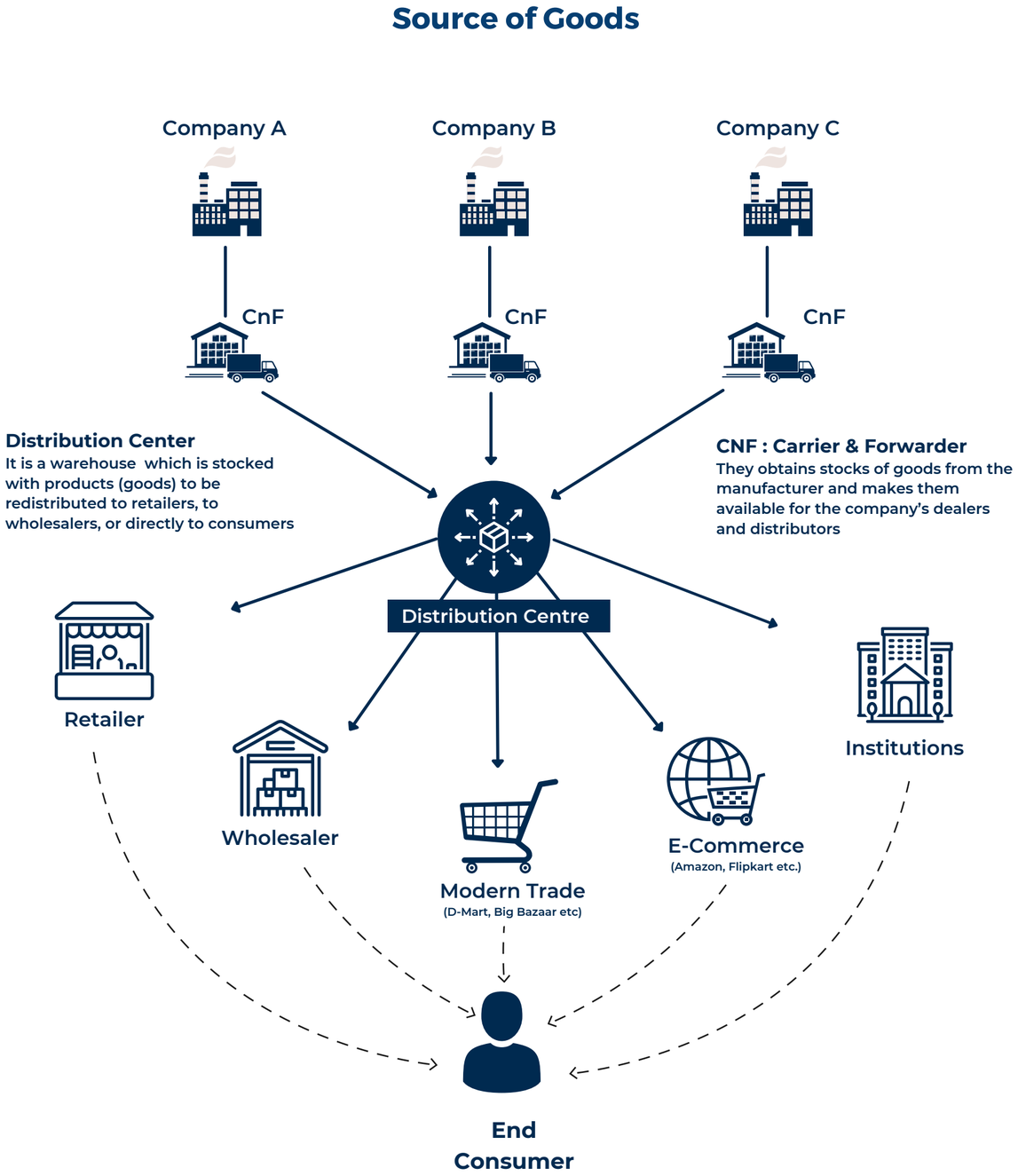
D-Mart

Indian Supply Chain has:

450000+
Distributors

200+
CnF of Major Companies

12.8M
Retailers



Carbon Footprint in the Current Supply Chain

Carbon footprint is the amount of carbon dioxide (CO_2) emissions associated with all the activities of an entity.

Carbon emissions increase the effects of climate change, resulting in extreme weather conditions and also affecting food production and animal habitats.

80%

of Greenhouse gas emissions of the FMCG industry comes only through the supply chain

India ranks 3rd
in Global CO_2 emissions

The Indian FMCG sector overlaps all segments of customers and markets; therefore, reducing its carbon footprint is vital for achieving sustainability.

Problems in the Existing Supply Chain

Traceability & Transparency

Inaccurate estimation of carbon emissions leads to scattered efforts to reduce carbon footprint.

Inventory Mismanagement

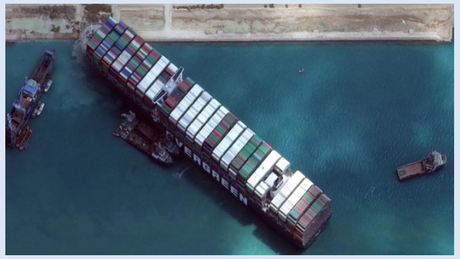
Space is not utilised correctly, which causes wastage and leads to delays in loading, shipping and delivery.

Product Expiration & Unsaleable Items

Companies don't have real-time information to keep short shelf-life products moving through the supply chain efficiently and profitably.

Threat of Counterfeit Goods

Counterfeit manufacturers selling pale imitations of their branded counterparts have detrimental effects on the company's profit and image.



A 400-meter cargo ship blocked the Suez Canal in March 2021. Companies that knew which ships were carrying their cargo could quickly reroute shipments to minimize the supply disruption. Those that lacked visibility were hit hardest.

Estimated Analysis of Current CO2 Emission

Case A

Let's consider a **Pan India Size FMCG Corporation**, Company A

Contributors to CO2 emission in the supply chain (in KTons) :

Net Carbon Emission = 1,795,000 Tons

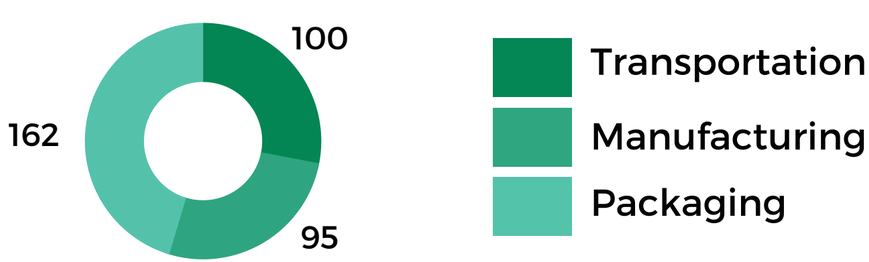
For 40 Pan India scale FMCG Organizations

Net Estimated Carbon Footprint: **71,800,000 Tons of CO2e**

Case B

Let's consider **Mid Size FMCG Corporation**, Company B

Contributors to CO2 emission in the supply chain (in KTons) :



Net Carbon Emission = 357,000 Tons

For 100 Mid Size FMCG Organizations

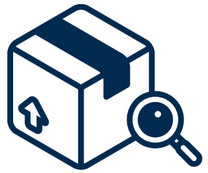
Net Estimated Carbon Footprint: **35,700,000 Tons of CO2e**

*Data References

Proposed Solution

Our proposal is to **track the journey of the products** through the supply chain through the means of an **RFID scanning system**. The collected data will be used to **increase the efficiency and sustainability** of the process as well as to **pinpoint critical areas** where change is required to optimise results.

Solving the problem for corporate:



- Improved Traceability of goods
- Continuous transparency in the supply chain

- Improved data collection and management on the server
- Reducing wastage by forecasting demand

- Eliminating counterfeit goods in the market
- Reinforcing brand image in the consumers

Why Traceability?

Apart from allowing companies to target critical areas of carbon emissions, this approach has the following benefits:

- Traceability would permit a company to make and verify sustainability claims.
- Information about product origins would secure consumer confidence in the quality and environmental effects, thus enhancing the company's brand.
- Assist in the elimination of counterfeit products in the grey market, also leading to increased sales.
- Forecasting demand will help reduce the wastage of packaging materials.
- Prediction of smart routes for logistics transportation.

68% of executives view traceability as "very or extremely" important. -Bain's recent Global State of Traceability survey

88% of consumers are now loyal to companies that support environmental issues.

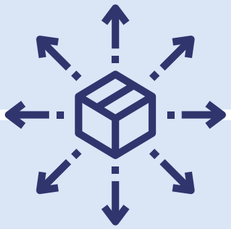
73% of millenials Globally are willing to pay extra for sustainable goods

Tracking Throughout the Supply Chain

Manufacturing Unit

CNF

Distribution Centre



Retailer

Manufacturing Unit to CNF

Tracking is done by attaching unique RFID tags to every carton and scanning them

CNF to Distribution Center

Similar setup at the CNF to scan the cartons when they arrive and when they are dispatched.

Distribution Center to Retailer

The person distributing the goods to wholesalers, retailers and modern trade will scan the cartons during the drop-off.

When a carton gets scanned at every distribution chain level, the collected data will be stored on the company's server. This will help companies track and regulate the flow of goods at every step.

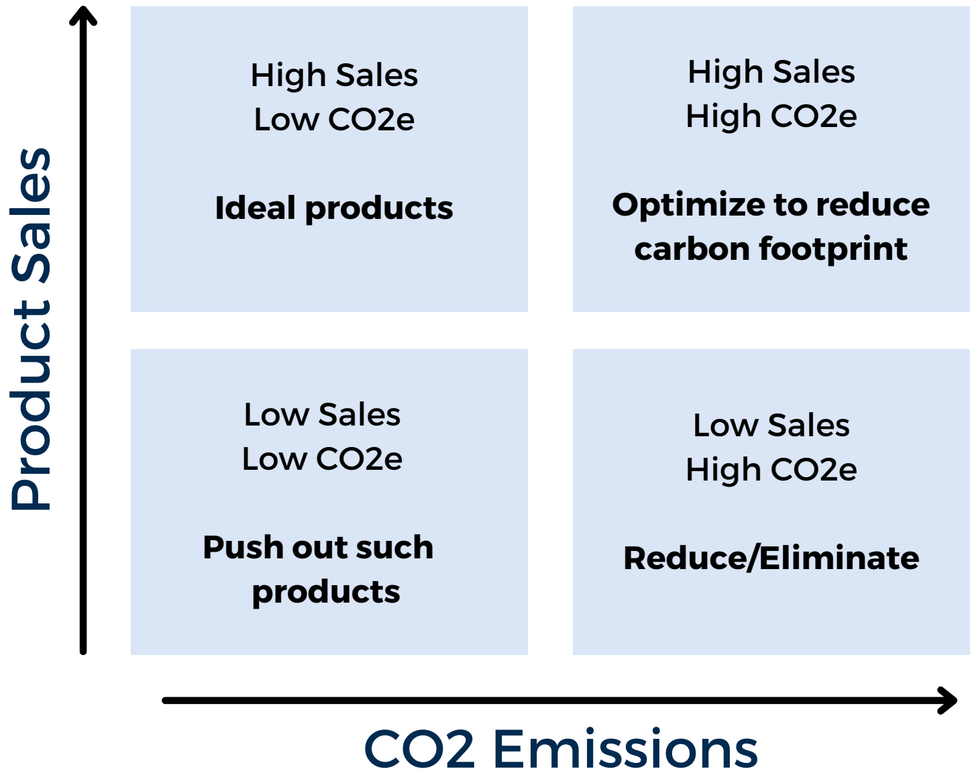
Demo Video:

Click here to view

Working of the Machine Learning Model

Products with **High Sales and Low CO2e** are ideal products and will be used as the model to optimize **products with high sales and CO2e**
The model will also suggest replacing products having **low sales and high CO2e with products having low sales and low CO2e**

Labelling of CO2e: Traceability will enable the company to track the journey of a product and determine the CO2 emissions based, and can label the packaging with average CO2e.



Along with this, the model will also optimize inventory management. Here, a control metric will be used-

Shelf Life Factor: The ratio of time for which the manufacturer can keep the stocks as Inventory TO time to deliver to the retailer from the Manufacturing unit. Using this metric, company can prioritize the stock dispatch from the inventory.

Blue Yonder as a SaaS Provider

Blue Yonder will set up a server between all Manufacturing Companies and Distribution Centres. The server will provide features such as **Login through an ERP system and alarm notifications** for late dispatches and other issues.

Companies will be provided with demand forecasts to reduce wastage. Private data of the companies will be secured in the system.

CNFs will be provided with the details of all the distribution centres under them.

Distribution centres will be able to place orders with a company through the system directly.

BlueYonder

DISTRIBUTION CENTRE ID

INVENTORY | CALENDAR | PLACE ORDER | REPORT | CONTACT MANUFACTURER

INVENTORY

S.No.	ITEMS	No. of cartons	Date of Dispatch
1	Biscuits	10	20/03/2022
2	Chips	53	05/03/2022
3	Soap	27	10/03/2022
4	Shampoo	21	17/03/2022

PLACE ORDER

P&G, Hindustan Unilever Limited, Dabur, BRITANNIA, emami, ITC Limited, Godrej, Nestlé

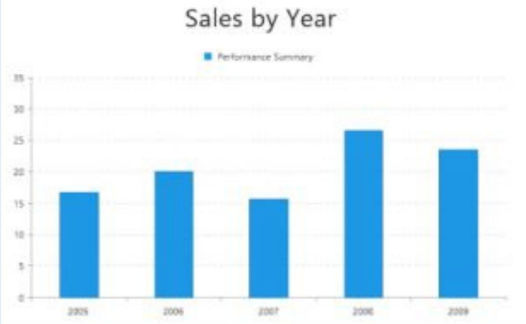
ARRIVAL CALENDAR

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

DISPATCH CALENDAR

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

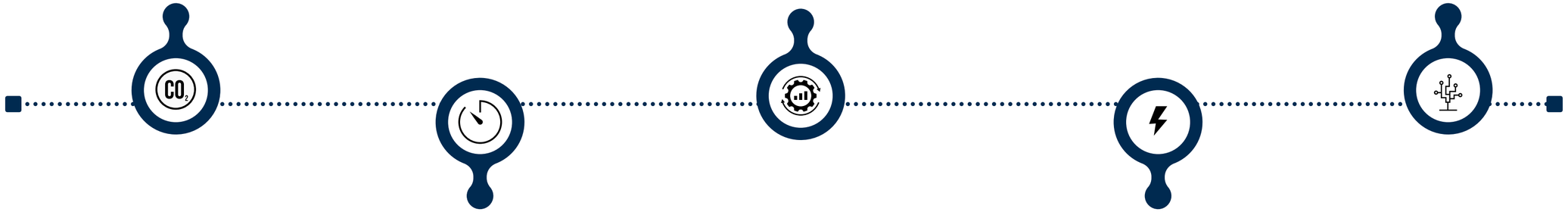
BUSSINESS ANALYTICS



Improved Efficiency

After the implementation of our solution, we will see efficiency in the supply chain through these metrics.

- Carbon footprint is being automatically calculated on the basis of tracking data.
- Optimization of the supply chain using ML model
- Servers are now backed up and a resilient network is built for cross-checking data.



- Products can now be traced easily till retailer level, and supervisors are notified of delays accurately in real-time
- RFIDs can scan thousands of codes at once with no physical labour, giving a faster ROI

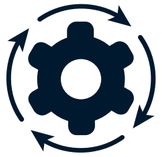
Implementation Plan for a single company

Software Setup

- Blue Yonder needs pre-existing software to handle incoming data after the pilot run succeeds.
- The database will be used by the ML model to optimise the current supply chain and reverse logistics.

Hardware Setup

- Barcodes will be replaced by RFID tags, which are ideally stickers of INR 4-6.
- RFID scanners will be given where they aren't present. They typically cost around INR 5k



Operations Setup

- All the transport centres are directed to install RFID scanners at entry-exit points while delivery workers are instructed to scan the packages when moving them.

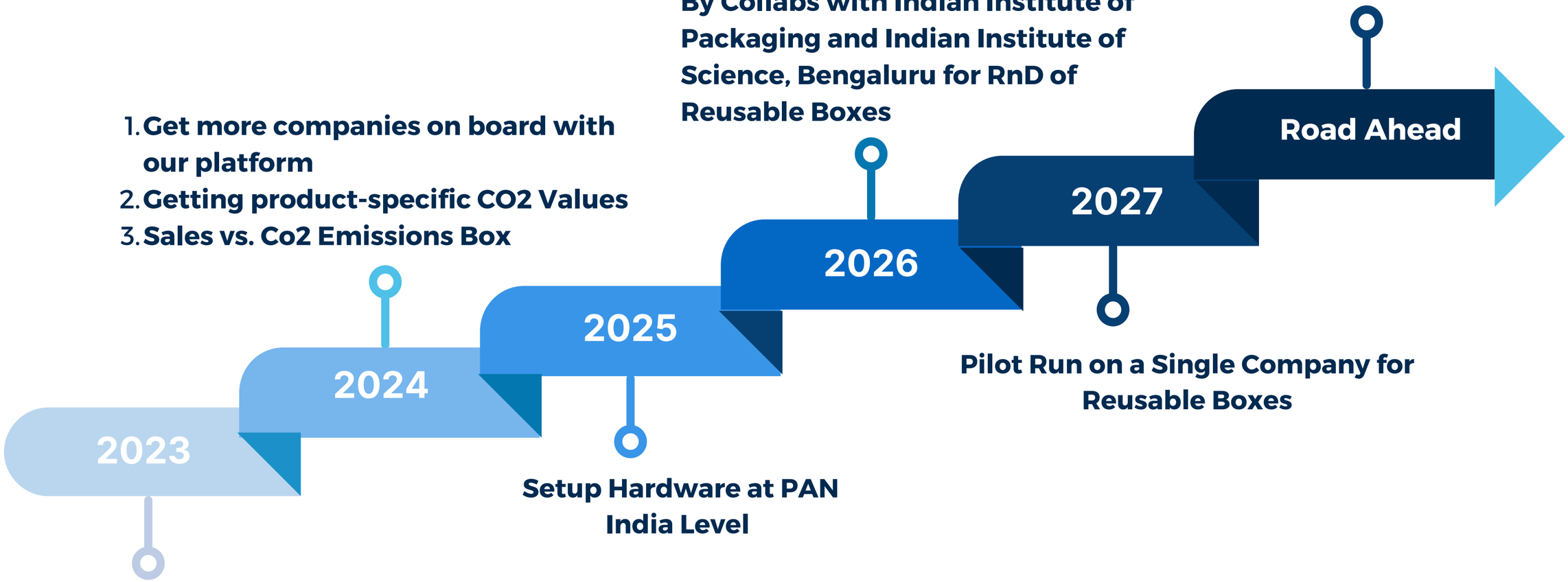
Pilot Runs

- The solution will be tested on one company at first, and data can either be collected from distribution centres or entered when the deliveries occur.
- No heavy investment is required for the pilot run if it is done on AWS. Data on AWS can also be encrypted and allows you to use your own encryption key. Therefore, the company data won't be at risk for being vulnerable
- AWS is preferred as it is cheaper and more efficient than setting up your own servers, though the latter is a possible choice if the company wants to own their data systems.

5-Year Road Map

Implementations for Longer Vision:

1. **BY Customers Reuse over Recycling**
2. **By entering into Licensing Business**



CO2 emissions after implementing solution

By Using Traceability and Reverse Logistics. Traceability can be used to identify areas where the Supply Chain is inefficient and releases GHG. It will also help in Inventory Management responsible for 4% of GHG Emissions worldwide in the food industry alone.Reverse Logistics will help us in the process of recovering Used Packaging Material. It will be Implemented after the success seen in our Traceability Model.

Year 1
We will start of our Pilot run with 5 Pan India FMCG Firms. We will identify specific Plants and their Distribution Network. Then gradually Expand customer base per Quarter

Formula for year 1:
(¼ th Emissions by a company in year) * (No. of companies in Pilot * Ratio of M.P in Pilot to total M.P of Company) * (% Reduced of Emission)

Quarter	No.of Companies	% Reduction in CO2e *	Net CO2e Reduction
Q1	5	0%	0 Ton
Q2	5	0.5%	1495.83 Tons
Q3	6 Going PAN India	1.0%	4786.66 Tons
Q4	8 PAN India	1.5%	29720 Tons

*Reduction of CO2e per company per quarter

Year 2-3
Including companies on PAN India Level

Formula Used
(Emissions per yr of Company)* (No. of Company* Ratio of M.P in Project to Total M.P.) * (% of GHG Saved) * (100-PERCENTAGE GROWTH IN EMISSION)%

Year	No.of Companies	% Reduction in CO2e *	Net CO2e Reduction
Year 2	14	3%	487,522 Tons
Year 3	22	5.5%	1,895,000 Tons

Year	No.of Companies	% Reduction in CO2e *	Net CO2e Reduction
Year 4	30	10%	4,652,640 Tons
Year 5	40	16%	11,488,000 Tons

Year 4-5
Following the success of our Traceability System, We will introduce our plan on Reverse Logistics to boost Packaging Material Retrieval.

By the end of the 5th year, we would succeed in reducing the carbon footprint in the Supply Chain by **16%**

Financial Feasibility of Solution

We are using a Bottom-Up approach to find the financial health of our business model. In this approach, we start with basic assumptions (such as developers needed and the cost thereof, attractiveness of our business, traffic) in order to build the financial model. This can give a more structured and realistic perspective, which can be implemented from a strategic point of view. Here we have assumed the business to have 5 Manufacturing Plants and their supplying regions, for 5 FMCG Companies and will scale up services gradually.

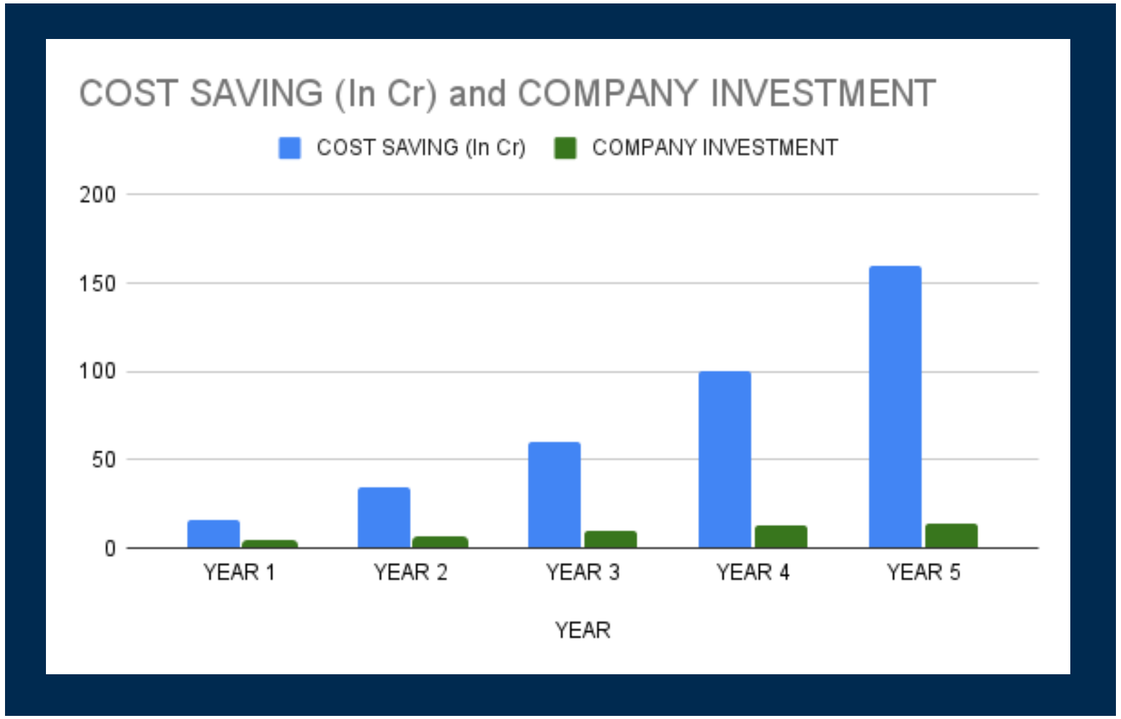
Assumptions:

1. We have assumed that the Emissions in Supply Chain from each Manufacturing Plant and the region that it supplies is **uniform.**
2. We have assumed that the company grows by 3% p.a. and Carbon Footprint follows.
3. We have assumed that the companies considered here don't have any large scale Carbon Footprint Reduction Strategies in place.

Click here to view detailed Financial Analysis

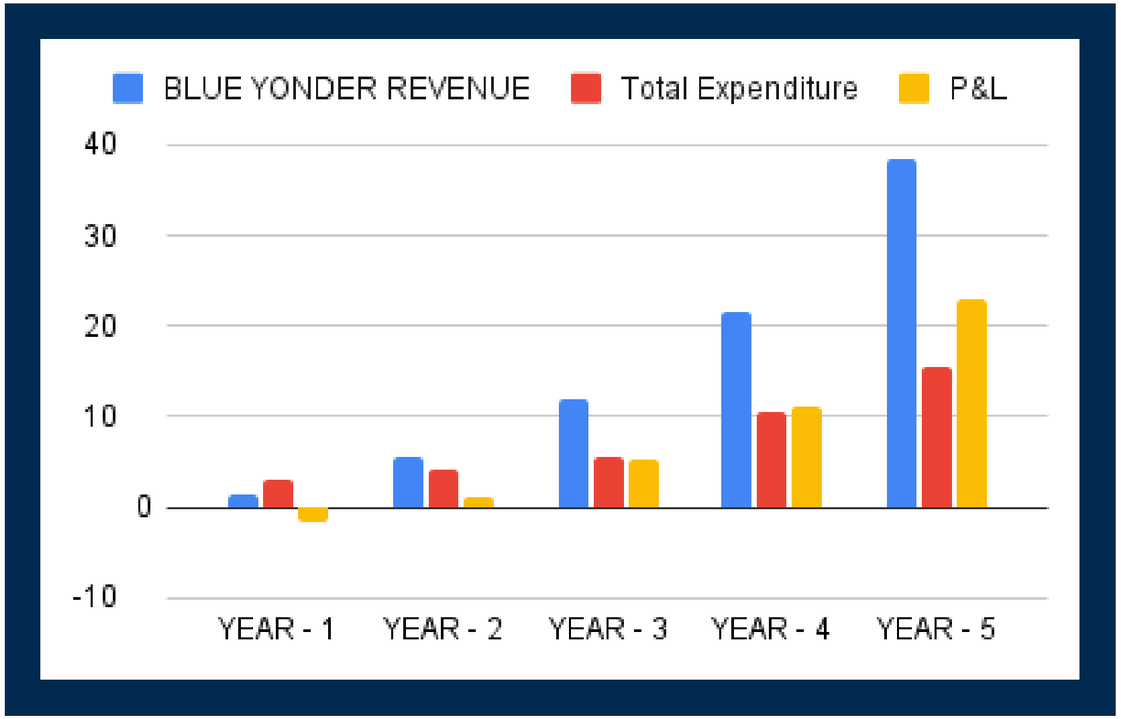
ROI

For FMCG Company



For the FMCG Organization, Cost Saving increases exponentially against Company Investment as time progresses from 2023-2027.

For Blue Yonder



Blue Yonder starts earning profit from Year 2 and reaches more than 50% profit by Year 5

Adaptability of Solution

Successful implementation of solution only requires:

1. **Introducing RFID Scanners at every level of the supply chain**. Third-party distributors will be incentivized by the company to purchase and use RFID guns.

2. **Setting up servers** for managing the data and taking decisions through AI/ML Model.

Incentivization to provide RFID scanners at CNFs and Distribution centres will be done by the company

The solution is implementable for all types of companies (mid to large-sized), as most companies already use barcodes and using RFID will only change the method, not the action.

Also, the supply chain of different products may differ but the basic flow remains the same:
Manufacturing >> CNF >> DC >> Retailers >> Customers

VISION

Revolutionizing Packaging

Going ahead, packaging should be a permanent part of the supply chain. Materials must be reused for at least five years rather than recycled till their quality completely degrades. **Research and Development of Reusable Boxes which can be Stacked Together for Lighter Reverse Logistics.**

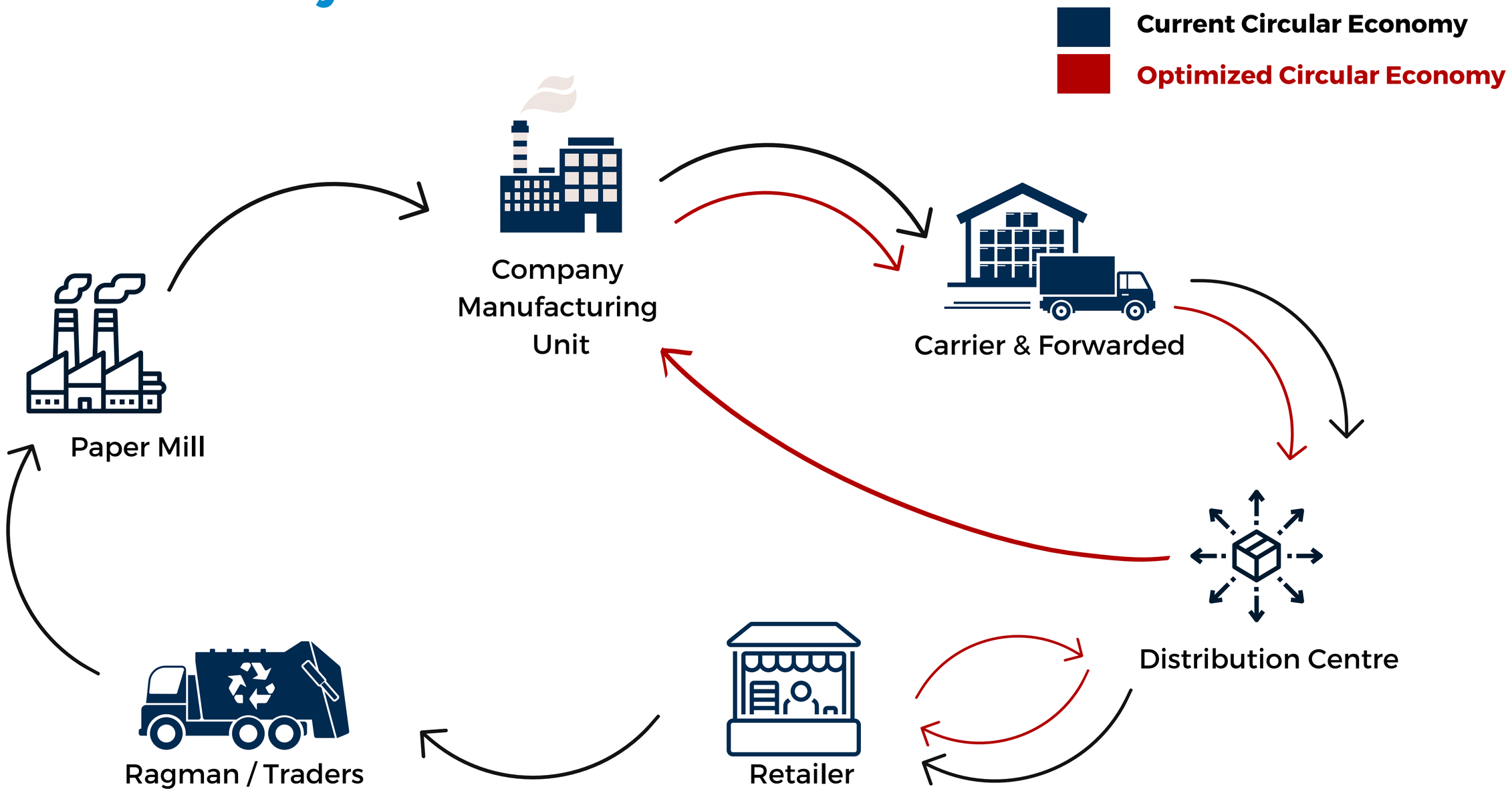
Sustainability Foundation

Our solution must not only solve the current problem at hand but contribute towards upcoming innovations. The aim must be to further reduce CO2e 30-40% in the following 10-15 years.

Eliminating Redundancy

Fast-changing consumer preferences require increased flexibility and speed. Traceability will enable companies to include efficiency and sustainability. Companies must set aspirational new goals for a greener planet.

Circular Economy of Cartons



THANK YOU