UMW Case Study:
Sustainability in the Manufacturing Industry

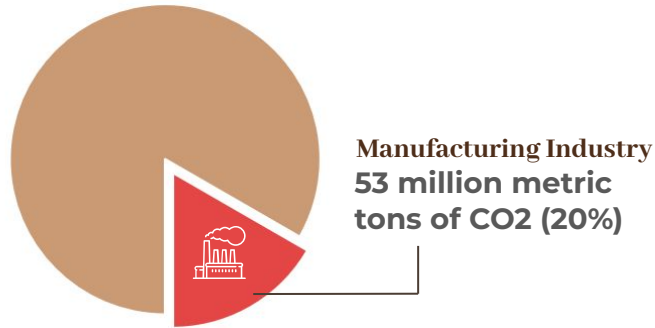Lim Cher Khai   Tan Ying Xin   Tan Ing Hann   Serena M Lade   Nehemiah Aaron
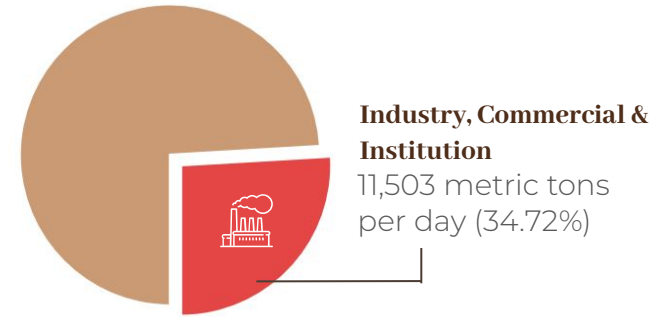
Prepared by Team ACES

Manufacturing industry accounts for 20% of CO2 emissions

Malaysia emitted **238.4 million metric tons of carbon dioxide (CO2)** in 2013

Manufacturing Industry 53 million metric tons of CO2 (20%)

Malaysia generated **33,130 metric tons of waste per day** in 2012

Industry, Commercial & Institution 11,503 metric tons per day (34.72%)

01 Global warming

02 Climate change
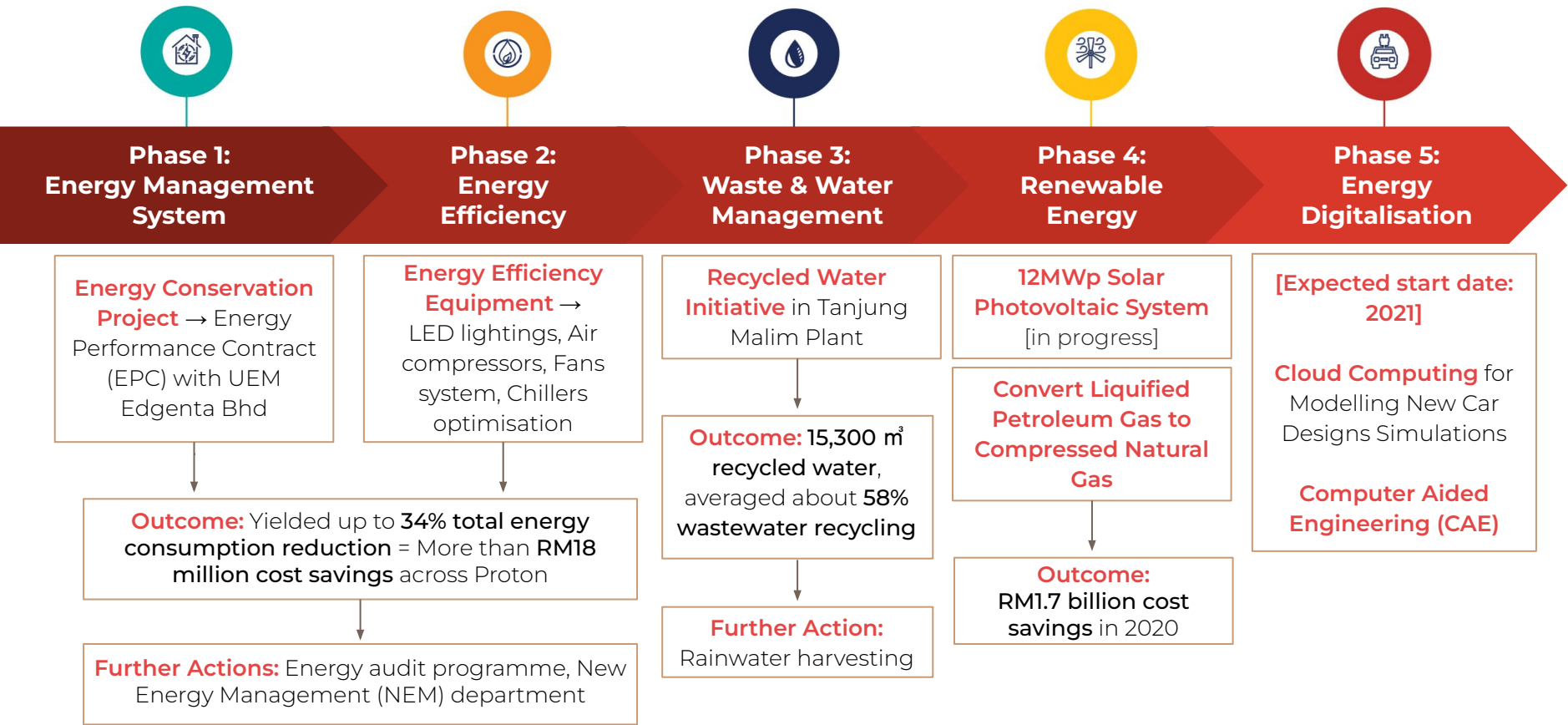
03 Pollution

04 Loss of biodiversity

How to reduce environmental impact? → **By being more sustainable!**

PROTON faces a delay in their Green Initiatives despite accomplishments in the early phase

Phase 1: Energy Management System	Phase 2: Energy Efficiency	Phase 3: Waste & Water Management	Phase 4: Renewable Energy	Phase 5: Energy Digitalisation

Phase 1:
Energy Conservation Project → Energy Performance Contract (EPC) with UEM Edgenta Bhd

↓

Outcome: Yielded up to **34% total energy consumption reduction** = More than **RM18 million cost savings** across Proton

↓

Further Actions: Energy audit programme, New Energy Management (NEM) department

Phase 2:
Energy Efficiency Equipment → LED lightings, Air compressors, Fans system, Chillers optimisation

Phase 3:
Recycled Water Initiative in Tanjung Malim Plant

↓

Outcome: 15,300 ㎥ recycled water, averaged about **58% wastewater recycling**

↓

Further Action: Rainwater harvesting

Phase 4:
12MWp Solar Photovoltaic System [in progress]

Convert Liquified Petroleum Gas to Compressed Natural Gas

↓

Outcome: RM1.7 billion cost savings in 2020

Phase 5:
[Expected start date: 2021]

Cloud Computing for Modelling New Car Designs Simulations

Computer Aided Engineering (CAE)

PETRONAS has already achieved 1 of the 4 Sustainability targets and is on track for the rest
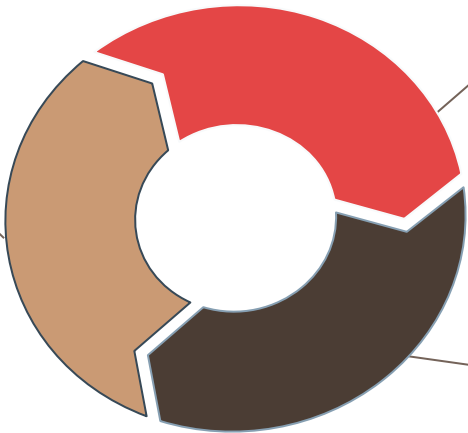
Sustainability initiatives

New Plastic Economy (NPE)

INNOVATION: non-recyclable plastic waste to crude naphtha facility

INFRASTRUCTURE: collection of plastic waste as feedstock

CLEAN-UP: Be Green Programme

EDUCATION: "Plastic, Sustainability & You" module

Energy and Loss Management System (ELMS)

Reuse gas waste as fuel to primary steam reformer which resulted in the reduction of natural gas consumption with **annual savings of 337,895 GJ of energy**

Producing Greener Energy

Generating over 600 MWp of renewable energy annually to power over 150 commercial and industrial customers in 200 locations.

Sustainability targets by 2024

On track   Achieved

Cap GHG emissions to 49.5M tonnes	Capped to **42.6M tonnes** in 2020
Promote Circular economy & waste management practices	**Introduce NPE** to transform waste into valuable resources
Increase renewable energy capacity to 3,000MW	**Capacity increased by 64.4 times** from 2019 to 2020
Reach 24,000 beneficiaries through education programs	**Ongoing scholarship programme** and other initiatives like SEEd.Lab

Problem Statement

Traditional manufacturing industry **generates 11,503 metric tonnes of waste per day** which is not **in line with the UN's sustainable development goals** by 2030.

How can UMW spearhead the sustainable smart factory initiative with IR 4.0 technology and reimagine manufacturing operations after COVID-19?

Health & Safety: Check-In
Preventing the spread of COVID-19

Waste Prevention: Seeloz
Redefining Supply Chain Planning with AI

Energy Generation: AuREUS
Harnessing UV ray to generate energy

Plan, prevent and alleviate Covid-19 risk to workforce by Contact Tracing Mobile Application: Check-in

Preventative measures
Emitting signals and alerts if social distancing rules are broken

Protect workforce, mitigate infection risks. Build trust in workforce

Digital Health Checks
Prevent potentially ill people entering workplace by **instantly alerting about infected close contact**

Reduces impact on others from an infected individual

Automatic Contact Tracing by Bluetooth, WiFi and GPS
Track exposure precisely to quickly contact the right person

Helps company with critical workforce decisions based on risk exposure

Flow of using Check-in

Installation of mobile app

⇩
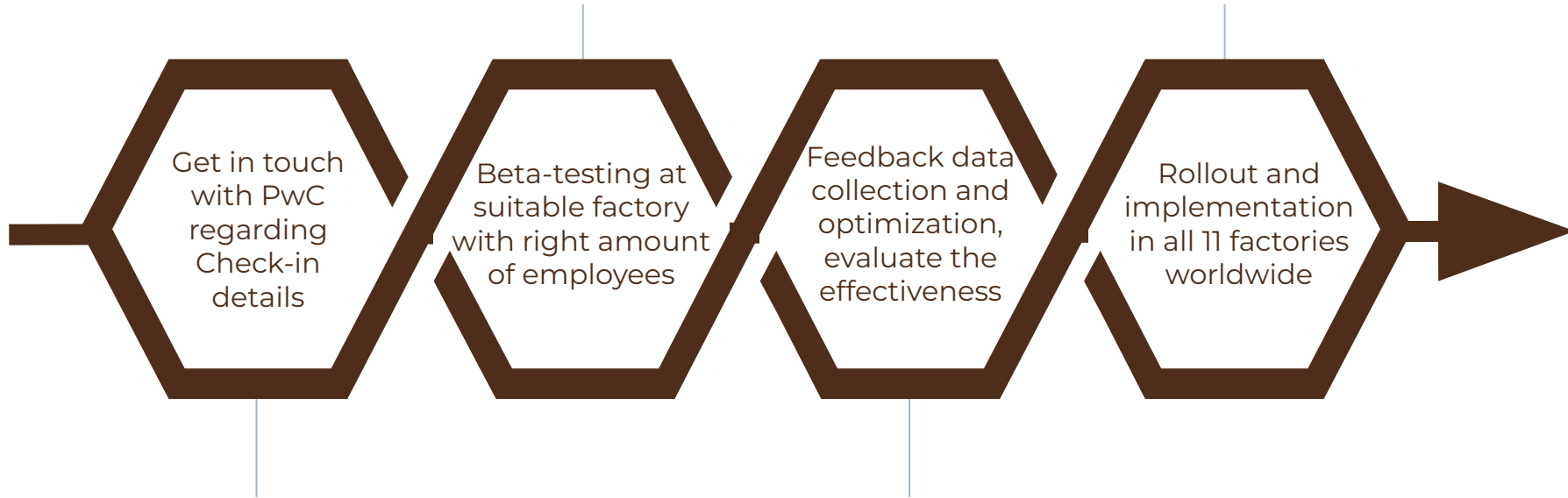
Email requested, Bluetooth and WiFi turned on

⇩

Collection and analysis of information for contact tracing

⇩

Information is summarised and presented on dashboard

Four Actionable Steps to deploy Check-In by PwC in UMW

Get in touch with PwC regarding Check-in details

Beta-testing at suitable factory with right amount of employees

Feedback data collection and optimization, evaluate the effectiveness

Rollout and implementation in all 11 factories worldwide

Before returning to work, employees prefer

61% Maintain social distancing

50% Prevent potentially ill people from entering workplace

15% uptake of contact tracing apps leads to an **8%** reduction in infections and **6%** reduction in deaths.

Going faster, stronger, sharper, leaner and greener with Seeloz

Seeloz preventing waste by harnessing the power of AI to fundamentally redefine supply chain planning with established track record with Microsoft, Pepsico and Deloitte

WHAT is it?

1. **Autonomous Requirements Planning (ARP)** system powered by AI

2. **Supply Chain Automation Suite (SCAS)** is to combat traditional forecasting and inventory management
   - Autonomous Procurement & Inventory (AP&I)
   - Control Tower

SCAS solutions lead to reduced overall costs from optimising supply chain

Turnover	↑ 50 - 80%	Faster
Average Inventory	↓ 20 - 40%	Leaner
Stockouts	↓ 40 - 70%	Stronger
Cross-Warehouse Movements	↓ 30 - 60%	Sharper

- AP&I
  - **Supply Chain Behavioural Learning** to replace traditional forecasting
  - **Autonomous Replenishment System** responds to near real time granular changes across demand, inventory and supply

- Control Tower
  - AI continuously monitor the supply chain then suggest **Actionable Insights** and recommended **corrective actions**
  - Determines its **Root Causes** to conduct efficient **risk analysis**

Seeloz reduces costs and optimize supply chain

SEELOZ Solution

↓ 20 - 40%	INVENTORY CARRYING COSTS
↓ 15 - 25%	SUPPLY CHAIN MANAGEMENT COSTS
↓ 20 - 40%	TRANSPORTATION COSTS
↓ 10 - 30%	CASH TO CASH CYCLE

Smaller inventory, reduction in potential overhead and labour costs and rental

Avoid procuring surplus of materials

Able to **predict sufficient order amount** to avoid multiple deliveries

Improves **cash conversion cycle** by streamlining Accounts Payable and Accounts Receivable processes

Outcome on

Environment	Productivity
✓	✓
✓	✓
✓	✓
	✓

Actionable Plan

Contact supplier for solutions and pricing ➤ Plug-and-play by integration with existing ERPs ➤ Train personnel to understand the tool and customise dashboard ➤ Evaluate ROI in weeks rather than months
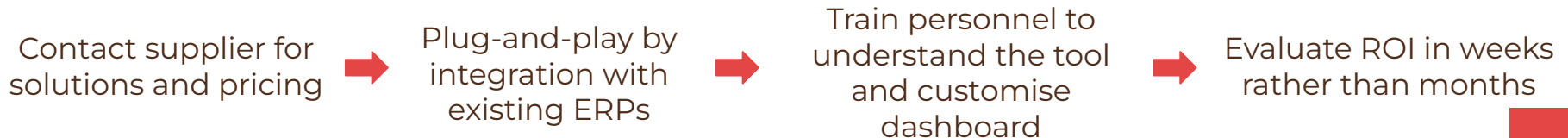
Utilizing unused surfaces to generate power using AuREUS

The James Dyson Award 2021 Sustainability winner, AuREUS is a material, made from waste crop, which converts UV light into renewable energy

Made from fruits and vegetables waste

Panels manufactured per month
Increased production rate with more funding
30

Generates electricity from UV light
Direct sunlight not necessary

Enables buildings to also serve as vertical solar farms
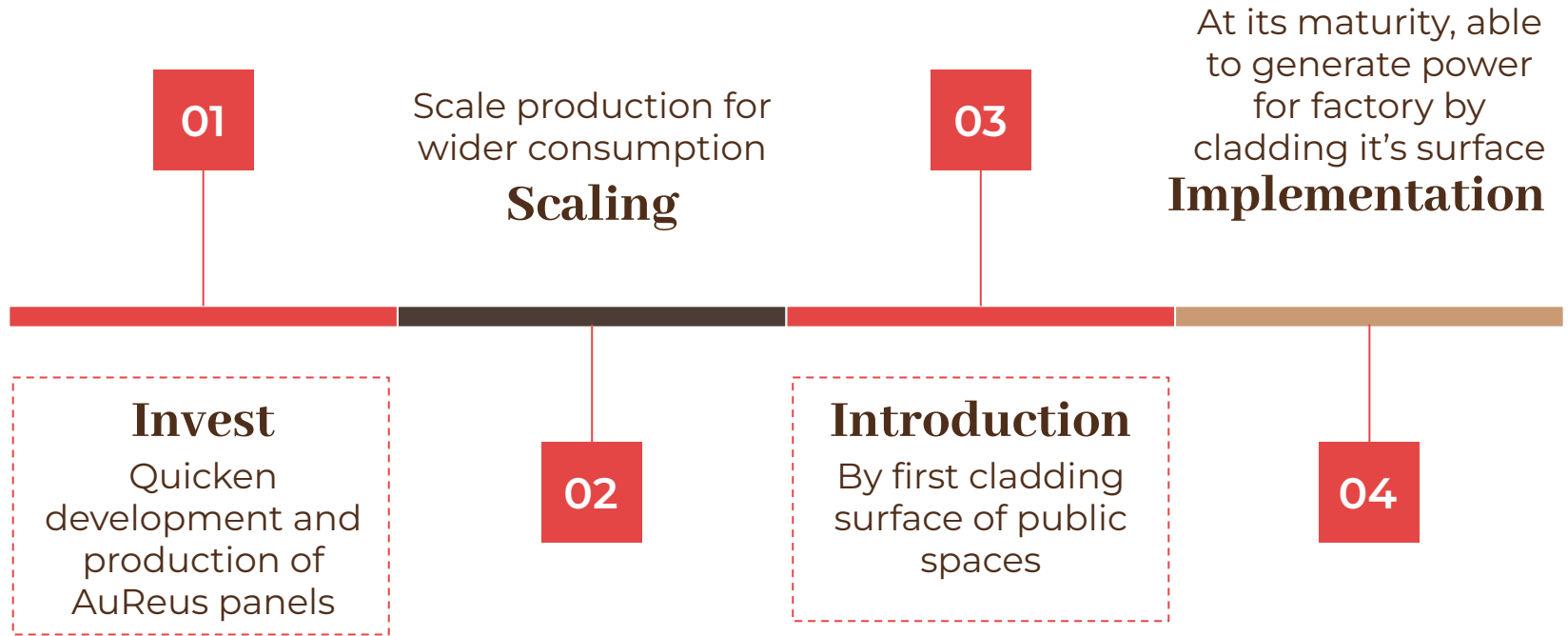
18kW
Of power generated a day
If replaced all stained glass planes of the Montreal Convention Center

Effective energy production hours
Opposed to the 15% to 22% of traditional solar panels
50%

Four Actionable Steps to Integrate AuREUS

01

Scale production for wider consumption
Scaling

03

At its maturity, able to generate power for factory by cladding it's surface
Implementation

Invest
Quicken development and production of AuReus panels

02

Introduction
By first cladding surface of public spaces

04

Investing and scaling is the bottleneck of integrating AuREUS, therefore UMW should **mobilize their in-house R&D team** to collaborate with AuREUS.

Implementation Plan

2021	2022		2023		2024		2025	
Present	Jan	July	Jan	July	Jan	July	Jan	July

Short term goal

Check-In Target rollout: November 2021

Mid term goal

Seeloz Target rollout: July 2023

Long term goal

AuREUS Target rollout: 2024

■ Contact Supplier   ■ Beta testing | Data collection & optimization   ■ Scaling   ■ Rollout worldwide