

Fundamental objectives for the PET Industries: running several hares at once

Petcore Europe Annual Conference 2023
Srinivasan Prabhushankar (Shankar)





“Reimagining
Chemistry
Together To Create
A Better World”

Indorama Ventures Overview (IVL:Bangkok)

One of the world's leading PET producers & recyclers:

Presence in
35 countries



1 in 5
PET bottles made
from our PET resin

140
Manufacturing
facilities

26,000+
employees



2025 Global Commitment

Incorporate
>750 KTA

of post-consumer PET material
as feedstock into our rPET
production per year

Recycle
50 billion bottles per year

Invest
\$1.5B

Leverage
30+ yrs of recycling experience

Committed to invest \$640M by 2030 to lower our emission



RENEWABLE ENERGY



OPERATIONAL ECO-EFFICIENCY



COAL PHASE-OUT



GREEN FUEL



EV FLEET



**CARBON CAPTURE
UTILIZATION & STORAGE**



GREEN HYDROGEN

Recycling Leadership

Vision

“To maintain PET as a **trusted** and **safe material**”

2025 Global commitment

In 2019, we made a global commitment to the Ellen MacArthur Foundation.

Recycle

750,000 tons of post-consumer PET bale input

Recycle

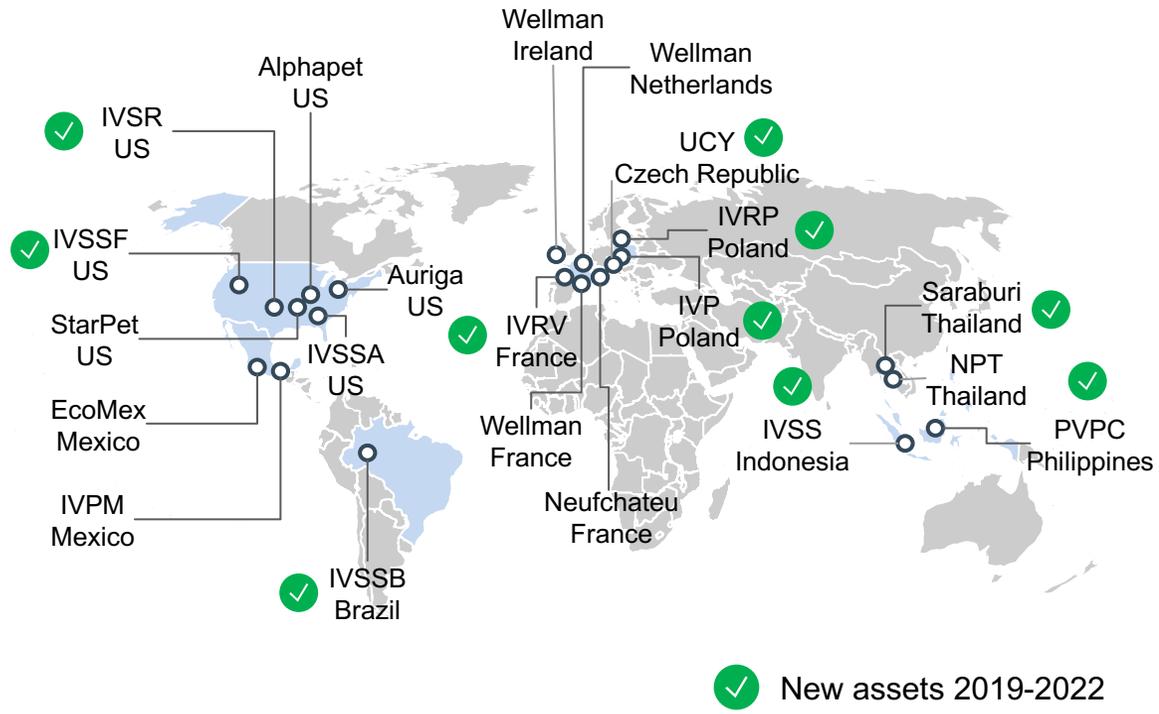
50 billion bottles per year

Invest

US\$ 1.5 billion to build and expand recycling facilities



IVL continued to expand recycling footprint despite pandemic, adding 9 new assets



Social, political and competitive pressures are driving sustainability

Consumers demanding sustainable packaging



Consumers' view climate change as a major threat.



62% of consumers agree it is important to buy products in environmentally friendly packaging



61% of consumers agree it is important to buy products in recyclable packaging

Laws requiring recycled content, better collection & less waste

Design requirements



Minimum recycled content, attached caps, design for recycling

Collection targets



90% PET bottles collection

Fiscal Measures



"Plastic Taxes", levies and changes

Sustainability and recycled content as a commercial advantage



35% recycled content in bottles by 2025



By 2025, 50% recycled content in water and beverage bottles; and 100% for Evian bottles



At least 50% recycled material in packaging by 2030.



25% recycled content in plastics packaging by 2025

PET's carbon advantage is helping us all reach our sustainability targets

Governmental net zero targets

-  Argentina by 2050
-  Brazil 2060
-  Canada by 2050
-  China by 2060
-  EU by 2050
-  Japan by 2050
-  South Korea by 2050
-  UK by 2050
-  US by 2050

and many others¹

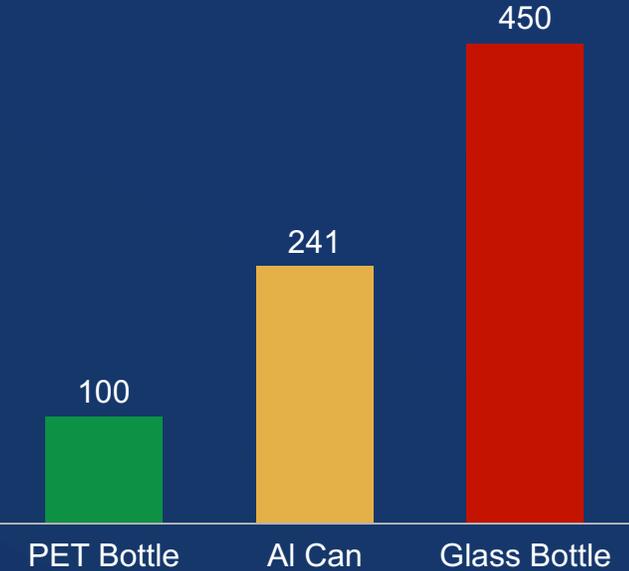
Corporate targets to carbon reduction

-  40% reduction by 2030
-  zero net emissions by 2050
-  30% reduction by 2030

and many others

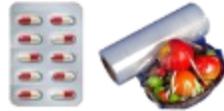
...Due to the low carbon footprint of PET and rPET, nation states and industry is turning to PET over alternative materials

GHG Emissions (PET 0.5 L CSD = Indexed)²



Note: (1) More countries can be found at www.climatechangenews.com/2019/06/14/countries-net-zero-climate-goal/ (2) Based on collection rate: PET 53%, Aluminum Can 63%, Glass 64% (Europe) - Source: Sidel

PET is the most recycled plastic polymer used in packaging

						
	PET	HDPE	PVC	LDPE	PP	PS
Common single-use applications	Beverage bottles Food trays 	Rigid: Milk jugs Flexible: Grocery bags 	Rigid: Blister packs Flexible: Food films 	Shrink films Container Lids 	Yogurt containers Bottle caps 	Foam containers Cutlery 
Recyclability ¹	100% recyclable	Frequently (Rigid) Rarely (Flexible)	Occasionally	Occasionally	Rarely	Rarely
Recycling Rates ²	~55% ³	~30% ⁴	<3%	~8%	<2%	~1%

1. Based on mechanical recycling technology; 2. US & EU average recycling rates except for LDPE for which the data is EU only; 3. PET bottles; 4. Rigid HDPE containers
 Note: Pictures are for illustrative use only; Figures are as of 2020E
 Source: Industry Data, IVL Analysis

Our 2030 vision is aligned with global sustainable trends



CIRCULAR ECONOMY

750 kt of recycling capacity through M&A, organic growth, and partnerships

Partner with organizations to intensify our contribution to circular economy

CIRCULAR ECONOMY

National Plastic Acts: reusable, recyclable, or compostable

Legislation: recycled content in packaging

GHG REDUCTION & RENEWABLE ENERGY

30% reduction in combined GHG (Scope 1 & 2) intensity

25% of energy consumption is renewable by 2030

NET ZERO CO2 & GHG EMISSIONS

EU, UK, US, Canada by 2050

More and more GHG targets

COLLECTION

Expand recycling infrastructure to give value to waste, increasing collection

Promote recycling and collection through information and educational campaigns

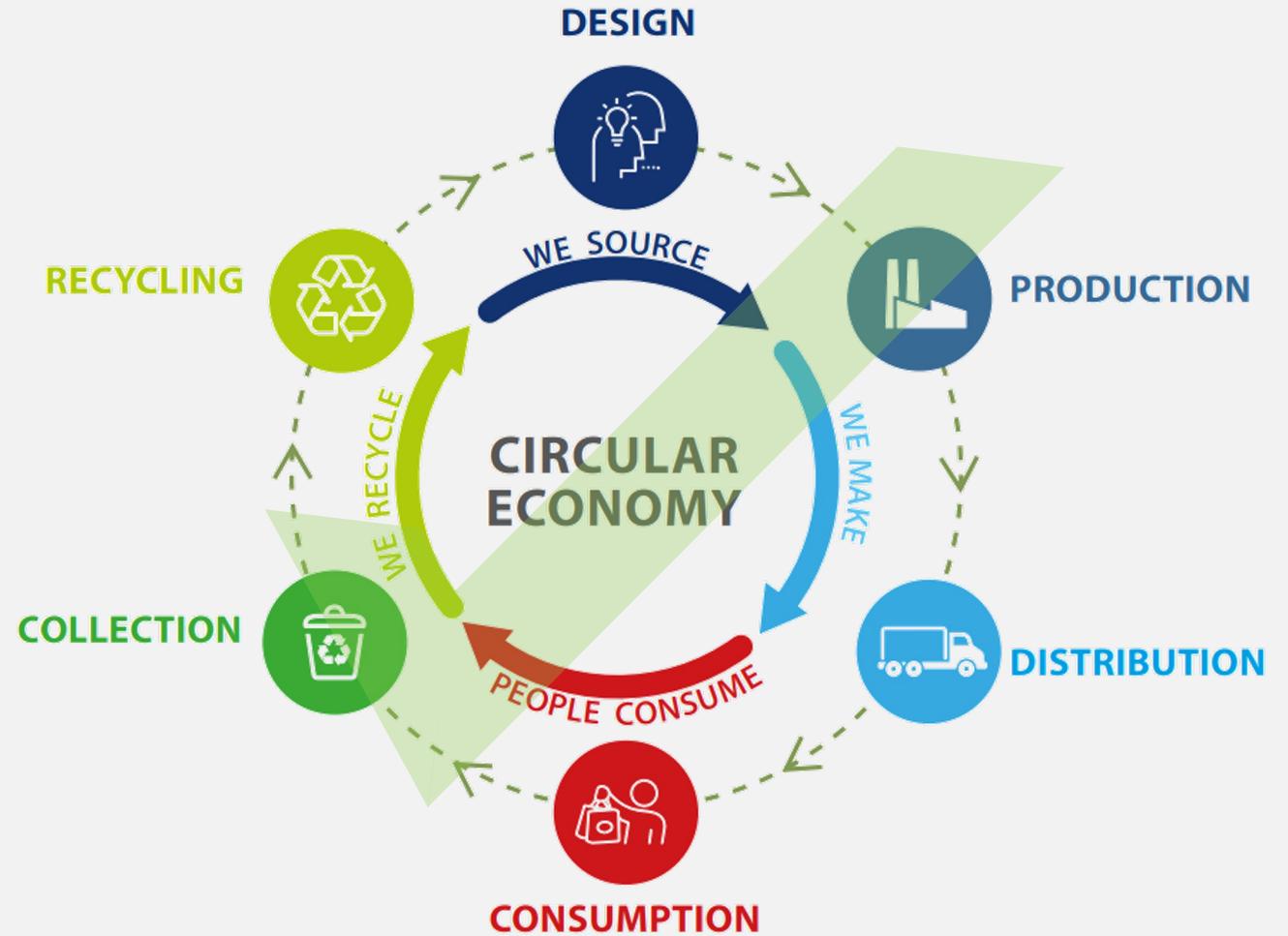
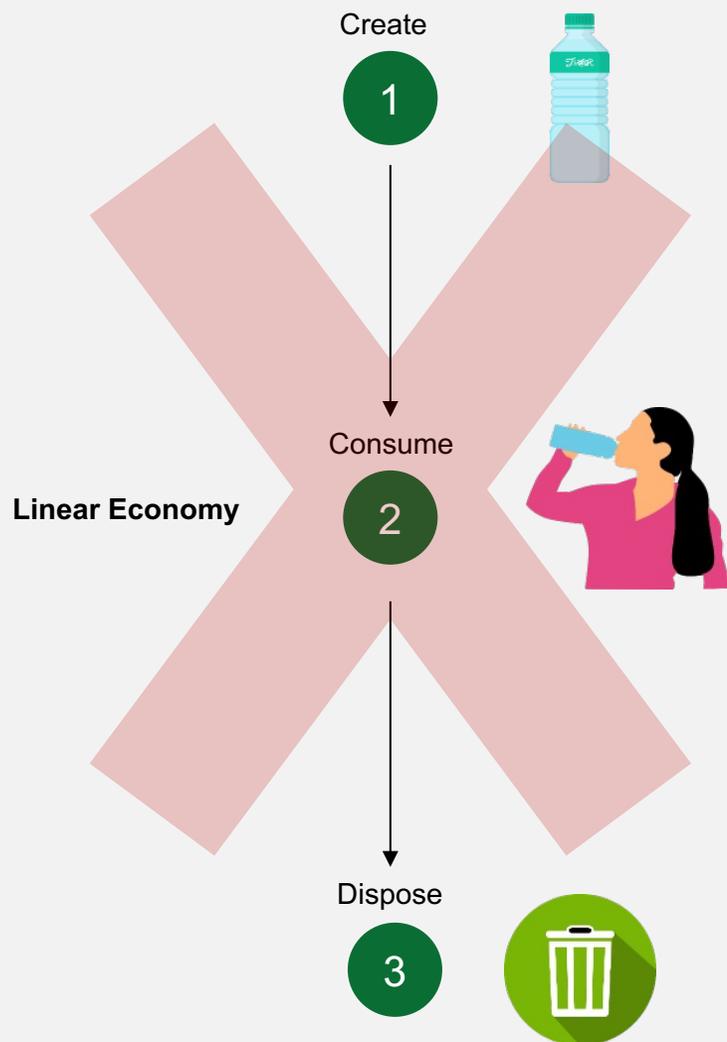
COLLECTION

Cross industry support for EPR programs

Bottled water brands openly backing deposit return systems

Note: *proposal
Source: IVL Sustainability Report 2019, Press searches

Investment in infrastructure drives the circular economy for PET



Global Recycling Education



Audience

Schools

- Teachers & Students from Kindergarten to College

Youth Activists

- Youth focused on and Interested in Recycling

Universities

- Sustainability and Entrepreneurship Centers at Universities

CONTENT	TOPIC		
	Beginner Lesson	Intermediate Lesson	Advance Lesson
Level 1 (Pre- Kindergarten to Grade 2)	Introduction to Recycling	What can you recycle?	Find it, Recycle it
Level 2 (Grades 3-5)	Recyclable, Non-Recyclable, and Potential Recyclers	Where does the trash go?	What Can You Make From Recycling?
Level 3 (Grades 6-8)	Waste Leakage in the Environment	A Waste Hero's Story	My Waste Audit
Level 4 (Grades 9-10)	Linear vs Circular Life Cycle	Creating the Circular Economy	Circular Design Challenge
Level 5 (Grades 11-12)	Circular Case Study	Redesign for Circularity	Circular Economy Model Canvas
Level 6: Workshop & SDGs (Universities & Youth Clubs)	<ul style="list-style-type: none"> Workshop 1: Problem Tree Workshop 2: Mind Mapping Workshop 3: Circular Business Model Canvas SDGs Workshop 		

Example of Global Recycling Education Materials

Example of classroom activity

Lesson Prep & Curriculum Alignment

Prep time: 15 - 25 minutes

Students will review and refresh their knowledge of recycling and the negative effects on the environment without recycling best practices. They will also be introduced to the concept of "waste leakage" as a result of not recycling and mismanagement of recyclables. They will work in small groups or individually to create a "Waste Hero" character and design a poster that will be used to convey a PSA (Public Service Announcement) message to inform, inspire, and encourage recycling at school. Students will receive a handout to create their character, then design their PSA poster and place the message around the school.

- 1 Display the lesson slides for the class and create a discussion about what they already know about recycling and introduce the concept of waste leakage and ocean bound waste. Ask students the guiding questions in the PowerPoint slide notes.
- 2 Print out the "YES/NO" handout and the "Create your 'Waste Hero'" handout. Gather all kinds of art supplies and poster boards or A3 size paper (1 per group or per student).

The Lesson

Lesson duration: 30 - 45 minutes

- 1 Students will receive the Circular Business Case Study handout with nine questions that they will answer based on the circular business card they choose. Allow them to do their own research online if they need.
- 2 Distribute the circular business card handouts and have students select one of the five circular businesses they will use for their case analysis.
- 3 Once they have answered all the questions for the case study they will map the areas of circularity found in their business case. The handout will consist of the linear stages of a product's lifecycle and have them draw in the arrows indicating the kinds of circularity used in their business case.

Lesson Plan and Presentation Instruction

Lesson Prep & Curriculum Alignment

Prep time: 15 - 25 minutes

Key Learning Outcomes and Curriculum Alignment

Science - Earth and Human Activity: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. Things that people do can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things.

English Language Arts and Literacy: Participate in collaborative conversations with diverse partners about topics and texts. Follow agreed-upon rules for discussions, use words and phrases acquired through conversations, reading and being read to, and responding to texts.

SDG Alignment

12 Responsible Consumption and Production

Lesson plans are designed to be flexible and responsive to the existing needs of your classroom. Lessons are editable and customizable to meet the different educational abilities and classroom interests. A printable PDF lesson are available for download.

Prepare the PowerPoint presentation

When you are ready to present the lessons to your class click on **Slide Show** on the top menu bar then select **Presenter View**. In Presenter view, you can see your notes as you present while the audience sees only your slides.



The notes appear in a pane on the right. The text should wrap automatically, and a vertical scroll bar appears if necessary. You can also change the size of the text in the Notes pane by using the two buttons at the lower left corner of the Notes pane.

Rachel Rabbit Learns to Recycle



"All we recycle needs to be cleaned and dried," Ray said, "because if we do not, it cannot be recycled." Ray washed the bottles and set them aside to dry. Rachel piled up all the clean cardboard, not garbage can.

Can you find the PET plastic bottles in this classroom?



Rachel Rabbit Learns to Recycle



PET Plastic Bottle Classroom Challenge

When they finished sorting the recycling everybody felt happy. All the garbage went into the garbage can. All the empty, clean and dry recycling items went into the recycling bin. "Ray," said Rachel, "I want to learn all about recycling." "Great, it is as simple as one, two, three," said Ray.



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

Recyclable

Cut out each card



Can it be recycle? WASTE HERO

Contaminated Item	How to get it ready to be recycled?

Non-Recyclable

Cut out each card



Create your WASTE HERO

What species, person, or character inspired your Waste Hero?	What is your Waste Hero's name?	Draw/Sketch your character.
What is your Waste Hero's superpower?	What are 3 words to describe your Waste Hero?	
What environmental problem does your Waste Hero address?		
What is your Waste Hero's message to inspire recycling best practices and encourage others to take action?		

Potentially Recyclable

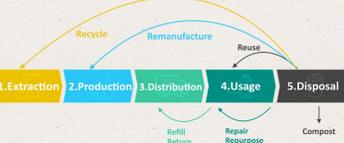
Cut out each card



Linear Economy VS Circular Economy

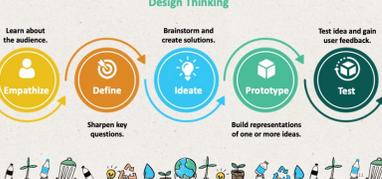


Life Cycle Mapping



Level 4-5 (Grades 9-12)

Design For Circularity



Design Thinking



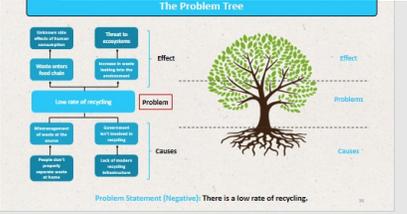
1. Choose an aspect from the "waste challenge" scenario
2. Create a mind map to visualize potential solution pathways
3. Identify the key ideas in the mind map and write them all down on sticky notes
4. Work through "down selection" exercises to choose the best solution

Solving for the SDGs



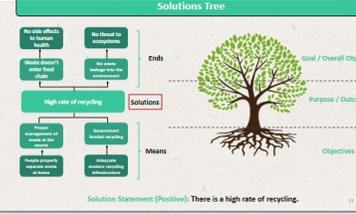
Workshop & SDGs (Universities & Youth Clubs)

The Problem Tree



Problem Statement (Negative): There is a low rate of recycling.

Solutions Tree

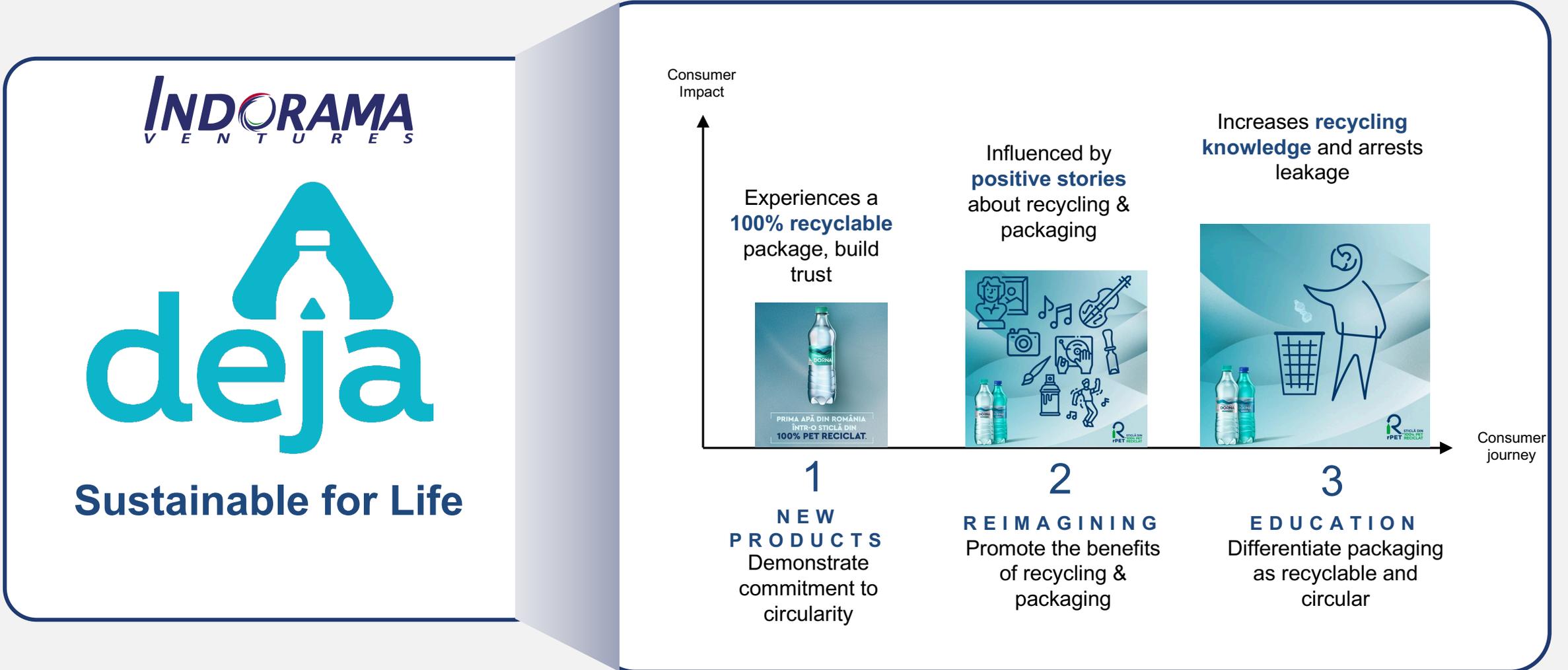


Solution Statement (Positive): There is a high rate of recycling.

Circular Business Model Canvas

Partners	Activities	Value Proposition (VP)	Customer Relationships	Customer Segments
Resources	Circular (VP)		Channels	
Costs		Revenue		
Circular Innovation		End-of-Life		

Introducing Deja as a sustainable PET brand





Thank you &
stay safe



Disclaimer

This presentation contains “forward-looking statements” of Indorama Ventures Public Company Limited (the “Company”) that relate to future events, which are, by their nature, subject to significant risks and uncertainties. All statements, other than statements of historical fact contained herein, including, without limitation, those regarding the future financial position and results of operations, strategy, plans, objectives, goals and targets, future developments in the markets where the Company participates or is seeking to participate and any statements preceded by, followed by or that include the words “target”, “believe”, “expect”, “aim”, “intend”, “will”, “may”, “anticipate”, “would”, “plan”, “could”, “should”, “predict”, “project”, “estimate”, “foresee”, “forecast”, “seek” or similar words or expressions are “forward-looking statements”.

Such forward-looking statements involve known and unknown risks, uncertainties and other important factors beyond the Company’s control that could cause the actual results, performance or achievements of the Company to be materially different from the future results, performance or achievements expressed or implied by such forward-looking statements. These forward-looking statements are based on numerous assumptions regarding the Company’s present and future business strategies and the environment in which the Company will operate in the future and are not a guarantee of future performance.

Such forward-looking statements speak only as at the date of this presentation, and the Company does not undertake any duty or obligation to supplement, amend, update or revise any such statements. The Company does not make any representation, warranty or prediction that the results anticipated by such forward-looking statements will be achieved.

The Company makes no representation whatsoever about the opinion or statements of any analyst or other third party. The Company does not monitor or control the content of third party opinions or statements and does not endorse or accept any responsibility for the content or the use of any such opinion or statement.