

Circular Economy Virtual Workshop 2020

SUSTAINABLE MATERIALS

Innovating Our Future
Beyond the Pandemic



REINVENTING SUSTAINABLE PLASTICS PACKAGING OPPORTUNITIES FOR POST-COVID FUTURE

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1

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PRINCIPLES OF CIRCULAR ECONOMY CONCEPT

1. Design out waste and pollution
2. Keep products and materials in use
3. Regenerate Natural Systems

2

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GLOBAL RESPONSE

1. Pledge by European Union and US to make all plastics packaging recyclable by 2030
2. Reusing, recycling or recovering all plastics packaging by 2040 ... Stretch Goal
3. Reduce the amount of waste generated and make it easier for products to be recycled
4. Encourage waste reduction strategies through greater consumer awareness, education and industry leadership
5. Increase demand for recycled products and collaborate on creating new markets for recycled materials



Despite efforts like
Design for Recycling (DFR)
Design for Environment (DFE)

Environmental impact considerations
have not been part of the Product
Design equation!!

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CONCEPT OF ECO-DESIGN

Integrated approach of incorporating Environmental Stewardship considerations of entire life cycle of a product during the product development stage



Addressing the all of the environmental impact considerations – including future issues associated with disposal at the end of the useful life of the product - **during design stage**

5

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KEY ELEMENTS



Prioritise
regenerative
resources



Design
for the
future



Preserve
& extend what's
already made



Rethink
the business
model



Incorporate
digital
technology



Use
waste as
a resource



Collaborate
to create
joint value

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Design For the Future (*Design Thinking*)

Using the right materials, to design for appropriate lifetime and to design for extended future use



Preserve and Extend What's Already Made (*Upycling*)

Maintain, repair and upgrade during use, to maximize Product lifetime and creating second life through take back strategies when applicable

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Prioritise Regenerative Resources

Ensuring utilization of renewable, reusable, non-toxic resources as materials and energy in an efficient way



Use Waste as a Resource

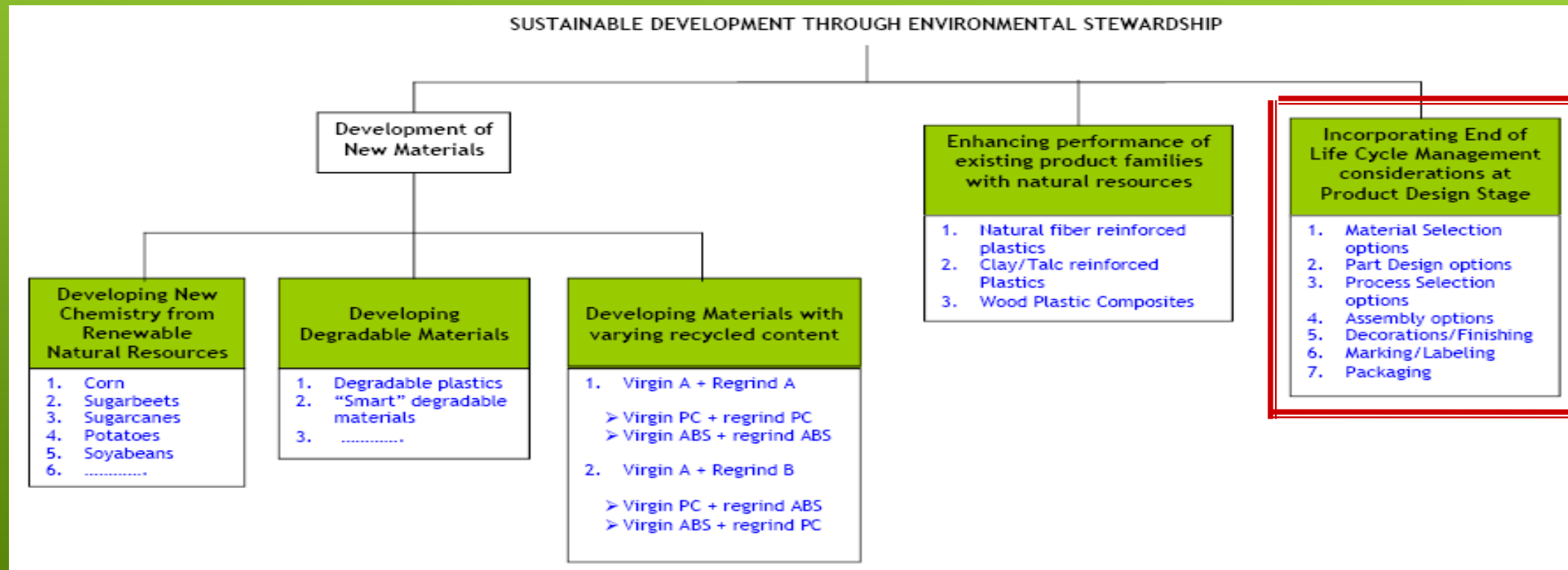
Utilizing waste streams as a source of secondary resources and recovering waste for reuse and recycling

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A COMPREHENSIVE ROAD MAP...



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OPPORTUNITIES FOR IMPACT

- ✓ Material selection
- ✓ Process selection
- ✓ Package design
- ✓ Eliminating Over Packaging

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MATERIAL SELECTION

- ✓ Minimizing material use, through selection of materials with higher performance characteristics such as natural fiber reinforced plastics
- ✓ Use of environmentally friendly plastics - plastics from renewable natural resources and degradable plastics
- ✓ Use of recycled content plastic
- ✓ Use of plastics or additives that do not contain or release substances harmful to the environment
- ✓ Use of less diverse materials

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Material Compatibility Chart

Material combinations	ABS	ASA	CA	EVA	PA 6	PA 6.6	PBT	PC	PE	PET	PMMA	POM	PP	PPO mod.	PS	PSU	Plasticised PVC	SAN	TPE-A	TPE-E	TPE-S	TPE-U	TPE-V	EPDM	NR/SBR	SBR	LSR
ABS																											
ABS/PC																											
ASA																											
CA																											
EVA																											
PA 6																											
PA 6 (mod. + 25 % GF)																											
PA 6.6																											
PA 6.6 (mod. + 25 % GF)																											
PA 6.12																											
PA 12 (mod. + 25 % GF)																											
PBT																											
PC																											
PC/PBT																											
PE																											
PET																											
PMMA																											
POM																											
PP																											
PPO mod.																											
PPE mod.																											
PS																											
PSU																											
Rigid PVC																											
SAN																											
TPE-E																											
TPE-U																											
BMC																											
EPDM																											
NR																											
SBR																											
LSR																											

- Good adhesion
- Poor adhesion
- No adhesion

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PROCESS SELECTION

- ✓ Use of processes that are more energy efficient and generate less amount of scrap, for package production



PACKAGE DESIGN

- ✓ Avoiding “overdesign” to compensate for too generous safety factors
- ✓ Intelligent use of reduced wall thicknesses through strategically placed narrow stiffening ribs, box beam ribs or even double walls with tack-off ribs
- ✓ Considering collapsible designs for hollow parts

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FINAL THOUGHTS

1. Concept of Circular Economy is here to stay !
2. Significant Technical, Social and Business challenges ahead !!
3. Plastics Packaging has to lead the way!
4. **PLASTICS HAS TO BE PART OF THE SOLUTION !!!**

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*THANK YOU
FOR YOUR
KIND ATTENTION!!*