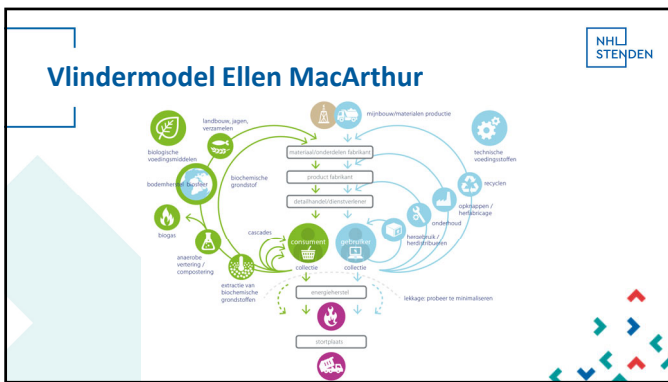




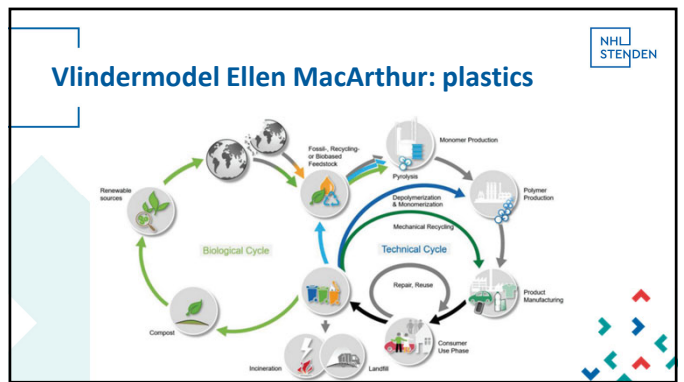
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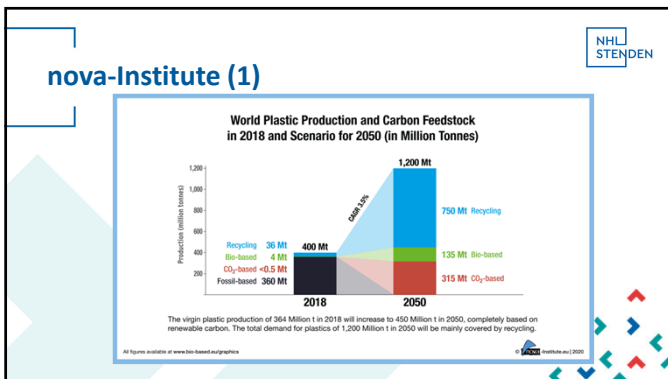
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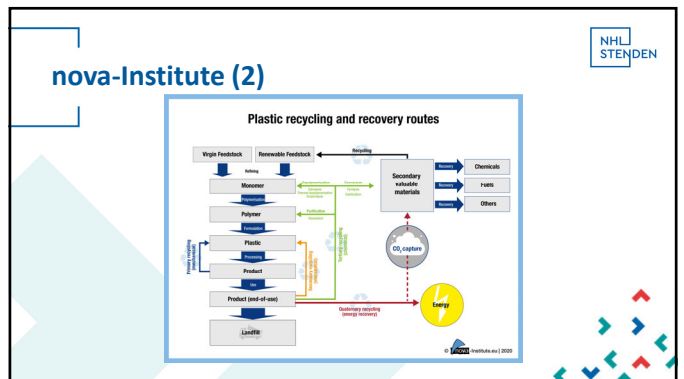
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nova-Institute (3)

Overview about the different methods for chemical recycling of plastic waste

Chemical recycling					
Solvent-based		Thermochemical		Enzymolysis	
Dissolution	Solvolysis	Pyrolysis	Gasification	In vivo	In vitro
Dichloromethane (DCM)	Alcohols	Thermal cracking	Steam gasification		
Methyl ethyl ketone (MEK)	Hydrolysis	Thermal depolymerisation	Air/Oxygen gasification		
Tetrahydrofuran (THF)	Aminolysis/Amidolysis	Catalytic cracking	Catalytic gasification		
Acids	Other solvents	Hydrocracking	Hydrogasification		
Other solvents					

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Recycling processes

a) Mechanical Recycling
Polymer to Polymer

b) Solvent-based Recycling
Polymer to Polymer

a) Remonomerization
Polymer to Monomer

b) Thermochemical Processes
(Mixed) Plastics to Feedstock

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Textile recycling

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Polyester (PET)

O=C(O)c1ccc(cc1)OC(=O)C2=CC=CC=C2

Process 1

the first stage (transesterification)
 $\text{HO}-\text{CH}_2-\text{CH}_2-\text{OH} + \text{H}_2\text{C}(\text{OOC}-\text{C}_6\text{H}_4-\text{CO})-\text{CH}_2-\text{OH} \rightarrow \text{HO}-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}(=\text{O})-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_2-\text{OH} + \text{H}_2\text{O}$

the second stage (polycondensation)
 $n \text{ HO}-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}(=\text{O})-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_2-\text{OH} \rightarrow \text{HO}-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}(=\text{O})-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}(=\text{O})-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_2-\text{O}-\text{H} + (n-1) \text{H}_2\text{O}$

Process 2

the first stage (direct esterification)
 $\text{HO}-\text{CH}_2-\text{CH}_2-\text{OH} + \text{HOOC}-\text{C}_6\text{H}_4-\text{COOH} \rightarrow \text{HO}-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}(=\text{O})-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_2-\text{O}-\text{H} + \text{H}_2\text{O}$

the second stage (polycondensation)
 $n \text{ HO}-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}(=\text{O})-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_2-\text{O}-\text{H} \rightarrow \text{HO}-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}(=\text{O})-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}(=\text{O})-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_2-\text{O}-\text{H} + (n-1) \text{H}_2\text{O}$

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PET depolymerisation

```

    graph TD
      A[Chemical Recycling of PET] --> B[Glycolysis]
      A --> C[Methanolysis]
      A --> D[Hydrolysis]
      A --> E[Others]
      B --> B1[BHET + Oligomer]
      C --> C1[DMT + EG]
      D --> D1[TPA + EG]
  
```

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Samenwerking met CuRe Technology

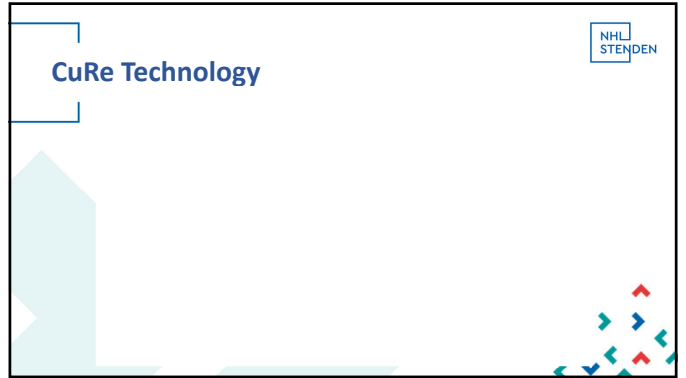
CuRe Technology
Compared to other recycling options

Technology	Input	Process	Output
Mechanical recycling	Transparent polyester	Sorting, washing and preparation → Mechanical recycling	Transparent polyester
CuRe Technology	Colored polyester	Sorting, washing and preparation → CuRe	Transparent polyester
Chemical recycling	Mixed plastics	Sorting, washing and preparation → Chemical recycling	Oil → Plastic protection → Plastic

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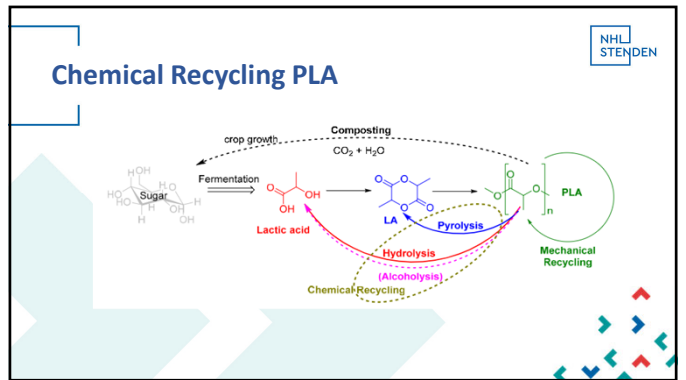
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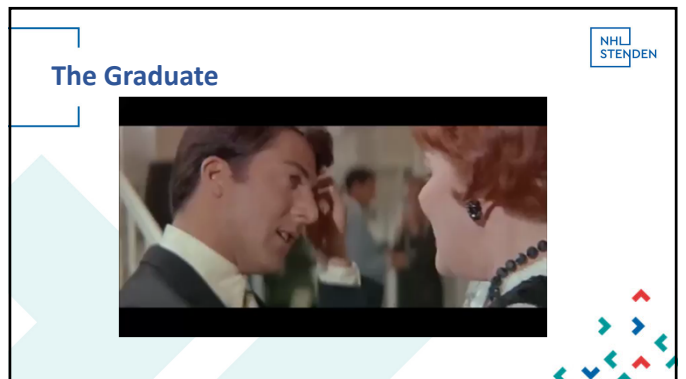
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