DESIGNING FOR COMPOSTABILITY IN CANADA

COMPOSTING IN A CIRCULAR ECONOMY

The National Zero Waste Council looks at product design and redesign as an important piece in the circular economy puzzle. Approaching zero waste as a design problem opens the door for creative problem solving and innovative solutions.

In a circular economy, materials are recirculated after use, either through a 'technical' recycling pathway, or a 'biological' recycling pathway – composting. Designing for compostability is an exciting alternative for certain categories of products and packaging to enter a more circular economy. This has become a hot topic as more designers consider composting as a desirable recovery pathway.

For the benefit of designers, purchasers, and the public, the Council delved into designing for compostability to: demystify the products and packaging which are on the market today, introduce purchasers and designers to when and how to design for compostability, and bring to light the potential and challenges for waste prevention and reduction using the composting recovery option. The Council is providing this information in their 2015 Designing for Compostability in Canada publication series.

The Designing for Compostability in Canada series includes:

A brief definitions package, including:

- Material Recovery Spectrum
- Material Recovery Options in a Circular Economy
- Can I Compost That Food Packaging?
- Pre- and Post Use Definitions

Two white papers on the Canadian context for compostables:

- Can I Compost That? Materials Acceptance Guide
- Can I Compost That? Certification and Acceptance

Two webinars:

- Can I Compost That? Products & Materials Demystified
- Success Stories Within the Value Chain

DESIGN FOR RECOVERY: MATERIAL RECOVERY SPECTRUM

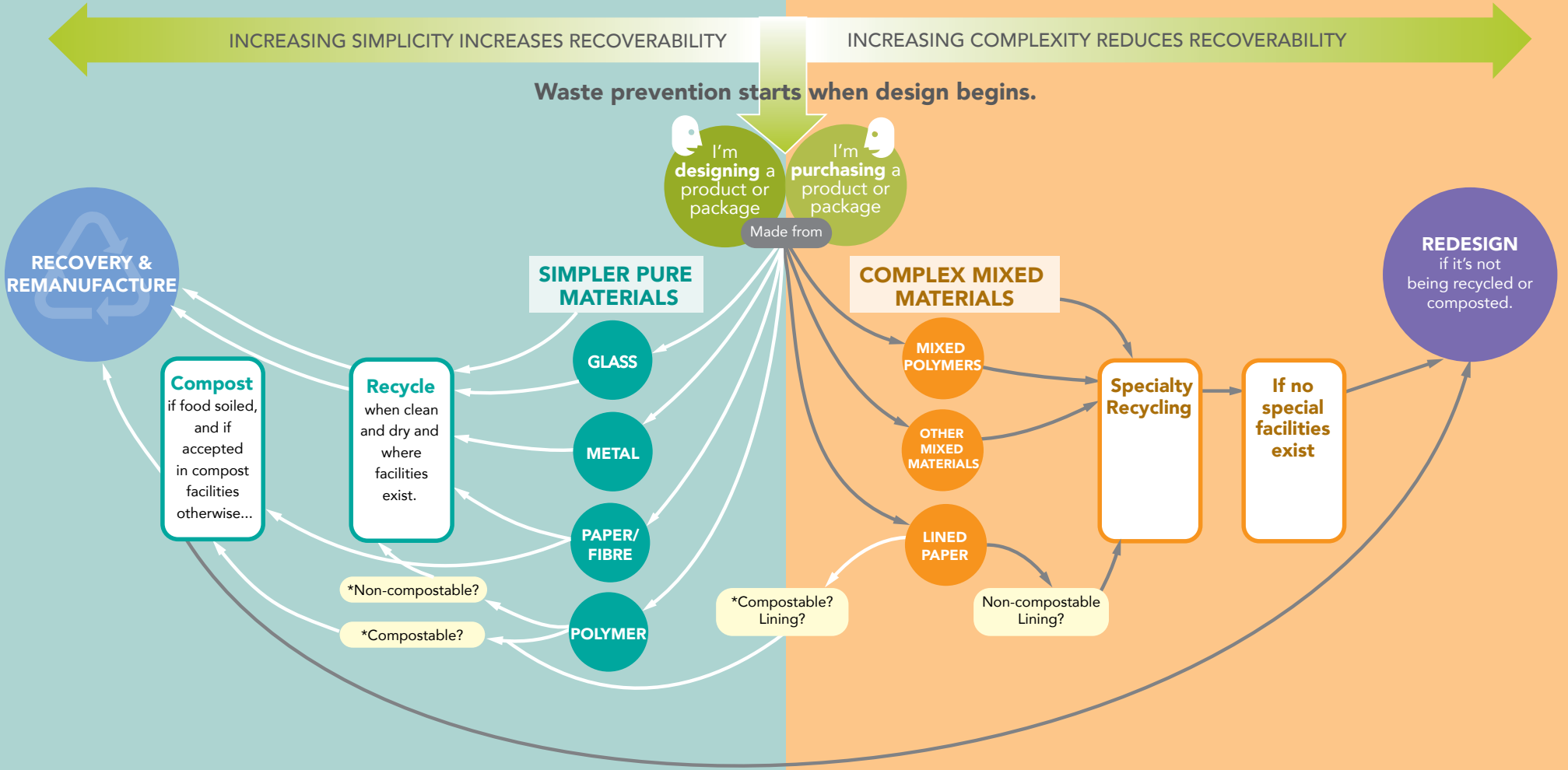
Designing for zero waste requires planning for recovery - both of the end products and packages, and the materials that go into making them all the way up the supply chain. This spectrum describes the five post use disposal scenarios to consider, and the broad categories of materials which fall under each. This list is non-exhaustive, and is meant as a quick reference guide for purchasers and designers when considering what materials to use in their product or package to reduce and prevent waste.

General Material Types	Thin to medium unlined paper and natural materials	• Certified compostable polymers: PLA, PHA, PHB, PBAT and paper lined with these • **Mixed** compostable polymers • Compostable metallized paper	• Plastic #3 (PVC) • **Mixed** polymer laminates (stand up pouches) • Metal-lined paper (candy wrappers, hot dog wrappers) • **Mixed** #7 plastics	• Plastics #6 and paper lined with these, e.g. milk cartons • **Pure** #7* plastics, including PLA and PBAT • Polymer-based paper	• Plastics #1, 2, 4, 5 • Clean, dry, fibre-based paper • Metal • Glass
Recovery Spectrum	Certified **compostable**, and infrastructure to compost **is** widely available	Certified **compostable**, but infrastructure to compost **is not** widely available	**Not Recyclable, Not Compostable** Landfill or incineration	**Recyclable**, but infrastructure to recycle **is not** widely available	**Recyclable**, and infrastructure to recycle **is** widely available

"**Pure**" means a material that is not paired with any other.
"**Mixed**" means a material that by design is inseparable or often not separated from another material

zero WASTE
NATIONAL ZERO WASTE COUNCIL

MATERIAL RECOVERY OPTIONS IN A CIRCULAR ECONOMY



COMPOSTABLE
IN INDUSTRIAL FACILITIES
Check locally, as these do not exist in many communities. **Not suitable for backyard composting.** CERT # SAMPLE
BPI ®

*CERTIFIED COMPOSTABLE
Look for the logos. If not numbers or logos are visible, assume it's conventional.

*NON-COMPOSTABLE
Look for numbers 1-7
3 6 7 usually not recyclable

PRE- AND POST USE DEFINITIONS

The labeling on compostable products and packaging can be confusing or misrepresentative. It is important to know which terms apply to the development of a product (pre-use), and which terms apply to downstream recovery options (post use).

POST USE

Biodegradable Under the right conditions, able to be broken down through the action of microorganisms, without having defined time limits during which the material must degrade. Biodegradation can occur in many specific environments: composting, anaerobic digestion, soil, marine or freshwater environments.

Compostable

This term applies to products which meet international standards for compostability. Being compostable means a product is biodegradable, plus additional parameters. If a product is compostable, it should have testing data available or a certification symbol on it.

Certified Compostable Certification requires that during testing, a product must demonstrate:

(1) rapid disintegration during composting (not visible after 180 days) (2) quickly biodegrades under composting conditions (3) no impact on the quality of the end compost to grow plants (4) not contain high amounts of regulated metals. Certification standards in North America include BNQ 0017, ASTM D668 and ASTM D6868.

Recyclable A product/material is capable of being converted into new materials with either greater utility (upcycling) or less utility (downcycling) than the original product.

Waste prevention starts when design begins.

PRE-USE

Biobased Made from renewable resources. Products can be tested and certified for their biobased percentage. Being biobased does not indicate anything about the product's ability to break down after use, and does not mean a product is biodegradable or compostable.

Biopolymer/Bioplastic A polymer which is biodegradable, has biobased content, or both, according to established industry standards and specifications.

Polymer A substance made of molecules which repeat one or more types of monomeric units (based on ASTM D883). Some polymers are certified compostable, for example: PLA (polylactic acid), PBAT (poly(butylene adipate-co-teraphthlalate)], and PHAs (polyhydroxyalkanoates), amongst others.

Some polymers are commonly recycled commercially; others are theoretically recyclable but not currently commercially recyclable.

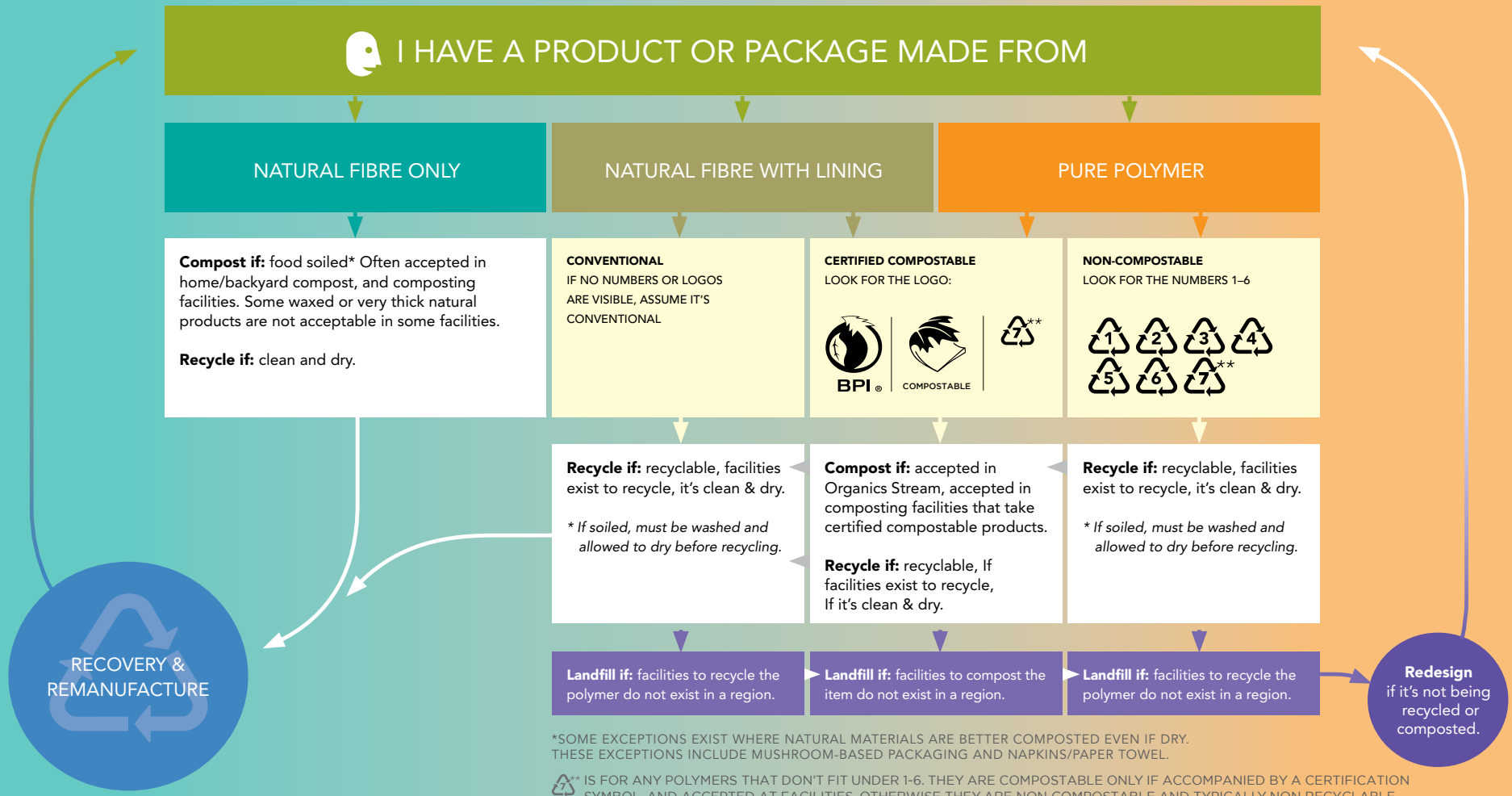
Other polymers are not compostable or recyclable.

Plastic A material that contains one or more polymeric substances of a large molecular weight, is sold in its finished state, and at some stage in its manufacture or processing can be shaped by flow.
(Based on ASTM D883).

DESIGNING FOR COMPOSTABILITY IN CANADA

Food packaging is the most likely suspect to be designed for composting. Post use, the user gets to decide whether a food package can and will be recovered. With innovations in compostable materials, it's increasingly confusing for designers and users on what enters the compost/organics stream. This flowchart guides the design and recovery of compostable food packaging through providing a snapshot of the realistic recovery options in Canada.

CAN I COMPOST THAT FOOD PACKAGING?



*SOME EXCEPTIONS EXIST WHERE NATURAL MATERIALS ARE BETTER COMPOSTED EVEN IF DRY. THESE EXCEPTIONS INCLUDE MUSHROOM-BASED PACKAGING AND NAPKINS/PAPER TOWEL.

7** IS FOR ANY POLYMERS THAT DON'T FIT UNDER 1-6. THEY ARE COMPOSTABLE ONLY IF ACCOMPANIED BY A CERTIFICATION SYMBOL, AND ACCEPTED AT FACILITIES, OTHERWISE THEY ARE NON COMPOSTABLE AND TYPICALLY NON RECYCLABLE.