Advancing a Circular Economy

Dr Jihane Ball,
Director, Global Product Safety and Compliance
EH&S and Sustainability, The Dow Chemical Company
Content

- Some Perspective
- Dow’s Sustainability Journey
- Dow’s 2025 Goals and Enabling the UN SDGs
- The Circularity Gap
- Circular Economy Policies and Business Models
- Capturing Opportunities and Navigating Challenges
- Key Considerations for Recycling and Interface Between Chemical, Product and Waste Legislation
- Are you Keeping Pace with Change or Anticipating it?
Some Perspective…

- 70% of buildings that will stand in 2030 are yet to be built in India.
- By 2025, the predicted urban population of China is 1 billion.
- Europeans need 2 – 3 planets worth of resources to sustain their current lifestyles.
- In Europe, 2.7 billion tonnes of waste was generated in 2010 and only 40% was reused, recycled, composted or digested.
- 50% of all the clothes manufactured globally are never sold or worn.
Population Growth by 2050

Forecast population, in millions, median variant

India
China
Nigeria
US
Indonesia
Pakistan
Brazil
Bangladesh
DR Congo
Ethiopia
Mexico
Egypt
Philippines
Tanzania
Russia
Vietnam
Japan
Uganda
Turkey
Kenya
Iran

Guardian graphic | Source: UN population division
Dow’s Sustainability Journey

2005 EH&S Goals
Journey to EH&S Excellence

2015 Sustainability Goals
Product Solutions to World Challenges

Dow’s Handprint

2025 Sustainability Goals
Dow’s Thought Leadership and Actions

Dow’s Blueprint

Footprint: World-leading operations and supply chain performance
Handprint: Products and services that help customers meet their challenges
Blueprint: Changes in technology, public policy, and the value chain that lead human society toward sustainability
Dow’s 2025 Sustainability Goals

Redefining the Role of Business in Society

#DOW2025
<table>
<thead>
<tr>
<th>2025 Sustainability Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leading the Blueprint</strong></td>
</tr>
<tr>
<td><strong>Delivering Breakthrough Innovations</strong></td>
</tr>
<tr>
<td><strong>Advancing a Circular Economy</strong></td>
</tr>
<tr>
<td><strong>Valuing Nature</strong></td>
</tr>
<tr>
<td><strong>Safe Chemistry for a Sustainable Planet</strong></td>
</tr>
<tr>
<td><strong>Engaging for Impact: Communities, Employees, Customers</strong></td>
</tr>
</tbody>
</table>
The Circularity Gap

Value of products, materials and resources maintained in the economy for as long as possible & waste generation minimized

Today, the world is only 9.1% circular – a massive circularity gap!

Closing the loop would:

- help achieve the UN SDGs and climate policy targets
- reduce raw material extraction
- prolong material value in the chain
- reduce/eliminate waste (by using waste as a resource)
- reduce incineration, landfilling and dispersion into the environment
- prevent accelerated environmental degradation and social inequality

(The Circularity Gap Report, 2018)
Alignment to UN SDGs

<table>
<thead>
<tr>
<th>SDG</th>
<th>Leading the Blueprint</th>
<th>Delivering Breakthrough Innovations</th>
<th>Advancing a Circular Economy</th>
<th>Valuing Nature</th>
<th>Safe Chemistry for a Sustainable Planet</th>
<th>Engaging Employees for Impact</th>
<th>World-Leading Operations Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DOW
Circular Economy Policies

Circular Economy policies emerging in several regions:
- EU Circular Economy Package
- UK 25-Year Environment Plan
- Policies in China
- Emerging policies in Canada
- Rising trends worldwide

Response to:
- Marine debris
- NGO pressure
- Societal expectations
Circular Economy Business Models

1. Circular supplies
2. Resource recovery
3. Product life extension
4. Sharing platforms
5. Product as a service

Circular Economy solutions for a water stressed region

Breakthrough Public-Private Partnership enables Municipal Wastewater to be used 3X

1. Water used by city of Terneuzen
2. City wastewater used to generate High Pressure Steam for the Dow site
3. Water reused again for Cooling Towers and then evaporated

Closing the Loop on Water: Dow Terneuzen
The Ellen MacArthur Foundation | Renault

- **Renault – a leader in the efficient use and reuse of materials**
  - Research projects to enhance the quality of recycled materials and reintroduce into the supply chain
  - Established closed loops by acquiring shares in dismantling and recycling companies
  - Launched a repair service using second-hand parts (checked and guaranteed) from end of life vehicles
  - Has remanufactured mechanical parts since 1949 in a dedicated plant (current turnover > €200 million)

- A vehicle requires a large quantity of high-value materials and is a product designed to last and be repaired.
- An ideal product for remanufacturing and reengineering during its life cycle.
Sharing Platforms

“UBER” for Bicycles
Dockless Bike-sharing in China
### Hack the take-make-waste model

- Keep your textiles in the loop
- Rethink the definition of ownership
- **Go for a more service-oriented business**
- A second life at the on-line marketplace
- Think about the impact of your marketing

### Why

**Involve the customer and minimize overconsumption:**

*We wear 20% of our clothes 80% of the time.*

*While clothes take back and recycling schemes (e.g. H&M, Pantagonia, M&S) are increasing, most of the discarded clothes today end up in landfills.*

<table>
<thead>
<tr>
<th>Curated Wardrobe</th>
<th>Filippa K’s online shop helps clients select timeless and high-quality pieces, and provides information on maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Repair service</strong></td>
<td>Nudie Jeans free repair shops</td>
</tr>
<tr>
<td>‘Made-to-measure’ and Tailoring à la carte</td>
<td>Involve the client in the making of the product.</td>
</tr>
</tbody>
</table>

*Back to the past but less exclusive?*
Capturing Opportunities

Opportunity Capture:
- Environmentally attractive products
- Meeting customer and market demands
- Demand for recycled materials
- Improved reputation

Material Footprint by Sector

(The Circularity Gap Report, 2018)
Navigating Challenges

Challenges:

- Infrastructure
- Substance restrictions and phase out/REACH
- Interface between chemical, product and waste legislation (CPW)
- Coordinating value chains and addressing calls for full compositional disclosures
- Consumer behavior
- Stranded assets

Compliance Obligations:

- Fees on products
- Taxes on resource use and waste
## Four Major Issues

<table>
<thead>
<tr>
<th>CPW Issues</th>
<th>CPW Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient Information</td>
<td>Defining, tracking and restricting Substances of Concern</td>
</tr>
<tr>
<td>Presence of Substances of Concern</td>
<td>Level playing field between primary/secondary materials and EU/non-EU articles</td>
</tr>
<tr>
<td>Difficulties applying End-of-Waste Criteria</td>
<td>Design for circularity and closer cooperation</td>
</tr>
<tr>
<td>Difficulties applying EU waste classification</td>
<td>Harmonized classification system</td>
</tr>
</tbody>
</table>

---

**Diagram Note:**
- **Chemicals**
- **Product**
- **Waste**
Are you Keeping Pace with Change or Anticipating it?

<table>
<thead>
<tr>
<th>CIRCULAR PROCUREMENT MODELS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. System level</strong></td>
</tr>
<tr>
<td>- Product service system</td>
</tr>
<tr>
<td>- Public Private Partnership</td>
</tr>
<tr>
<td>- Cooperation with other organisations on sharing and reuse</td>
</tr>
<tr>
<td>- Rent/lease</td>
</tr>
<tr>
<td>- Supplier take-back systems including reuse, recycling, refurbishment and remanufacturing</td>
</tr>
<tr>
<td><strong>2. Supplier Level</strong></td>
</tr>
<tr>
<td>- Supplier take-back system</td>
</tr>
<tr>
<td>- Design to disassembly</td>
</tr>
<tr>
<td>- Reparability of standard products</td>
</tr>
<tr>
<td>- External reuse/sale of products</td>
</tr>
<tr>
<td>- Internal reuse of products</td>
</tr>
<tr>
<td><strong>3. Product</strong></td>
</tr>
<tr>
<td>- Materials in the product can be identified</td>
</tr>
<tr>
<td>- Products can be disassembled after use</td>
</tr>
<tr>
<td>- Recyclable materials</td>
</tr>
<tr>
<td>- Resource efficiency and Total Cost of Ownership</td>
</tr>
<tr>
<td>- Recycled materials</td>
</tr>
</tbody>
</table>

(Source: SPP Regions Best Practice Report)