Strategic Waste Infrastructure Planning Project (SWIP)

Update
• Technology

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Four elements

1. Planning and Approvals
2. Facilities and Sites
3. **Technology**
4. Governance and Funding
Aim of technology component

- Identify what types of waste and recycling infrastructure is required to achieve the waste diversion targets

- Estimate how much infrastructure is required to achieve the waste diversion targets
What do we want from the technology?

• Reliable
• Flexible
• Provide sufficient capacity
• Good environmental performance
• Cost effective
• Be able to meet the waste diversion targets
Processing technology categories considered

• Materials recovery facility (MRF)
• Mechanical biological treatment (MBT)
• Enclosed composting (including anaerobic digestion)
• Open windrow composting
• Thermal waste to energy (W2E)
• C&D recycling facility
System options – treatment of residuals

1. MBT producing “compost-like organics” (CLO)
2. MBT producing refuse-derived fuel (RDF) for W2E
3. No MBT, residuals straight to W2E
4. No MBT, no W2E – residuals straight to landfill

Each option includes:

• enclosed and open composting of source-separated organics
• sorting through a MRF of co-mingled recyclables
• source-separated and mixed C&D recycling facilities
System Option 1 – MBT to CLO

Source separated recyclables

Co-mingled recyclables

General waste

MRF

MBT

Recycler (paper, plastic, metal, compost, etc)

Landfill
System Option 2 – MBT to RDF

Source separated recyclables → Recycler (paper, plastic, metal, compost, etc)

Co-mingled recyclables → MRF

General waste → MBT

MBT → W2E

W2E → Landfill
System Option 3 – Residuals to W2E

- Source separated recyclables
- Co-mingled recyclables
- General waste
- MRF
- W2E
- Recycler (paper, plastic, metal, compost, etc)
- Landfill
System Option 4 – No MBT, no W2E

Source separated recyclables

Co-mingled recyclables

MRF

Recycler (paper, plastic, metal, compost, etc)

General waste

Landfill
Sensitivity analysis

Scenario 1 – High waste generation and low source-separation (30%)

Scenario 2 – Medium waste generation and medium source-separation (50%)

Scenario 3 – Low waste generation and high source-separation (70%)
Sensitivity analysis – required capacity

Estimated total processing capacity required (Mtpa)

- **Option 1** - MBT to CLO
- **Option 2** - MBT to RDF
- **Option 3** - W2E; no MBT
- **Option 4** - No MBT; no W2E

- C&D recycler (mixed)
- C&D recycler (source-segregated)
- Recyclers
- Waste to energy
- W2E pre-treatment (mechanical)
- Mechanical Biological Treatment (MBT)
- Open windrow
- Enclosed composting
- Materials Recovery Facility (MRF)
Sensitivity analysis – estimated CAPEX ($mill)

Option 1 - MBT to CLO
Option 2 - MBT to RDF
Option 3 - W2E; no MBT
Option 4 - No MBT; no W2E

- C&D recycler (mixed)
- C&D recycler (source-segregated)
- Recyclers
- Waste to energy
- W2E pre-treatment (mechanical)
- Mechanical Biological Treatment (MBT)
- Open windrow
- Enclosed composting
- Materials Recovery Facility (MRF)
Meeting the 2020 targets – MSW = 65%

• Option 1A – MBT to CLO; low source-separation
• Option 1B – MBT to CLO; high source-separation
• Option 2A – MBT to RDF; low source-separation
• Option 2B – MBT to RDF; high source-separation
• Option 3A – W2E; no source-separation
• Option 3B – W2E; high source-separation
• Option 4 – no MBT, no W2E; high source-separation
Meeting the 2020 MSW targets - required capacity (Mtpa)

<table>
<thead>
<tr>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
<th>Option 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBT to CLO - low SS</td>
<td>MBT to CLO - high SS</td>
<td>MBT to RDF - low SS</td>
<td>MBT to RDF - high SS</td>
</tr>
<tr>
<td>64%</td>
<td>67%</td>
<td>77%</td>
<td>60%</td>
</tr>
<tr>
<td>MBT to RDF - low SS</td>
<td>MBT to RDF - high SS</td>
<td>W2E - no SS</td>
<td>-</td>
</tr>
<tr>
<td>65%</td>
<td>78%</td>
<td>84%</td>
<td>-</td>
</tr>
<tr>
<td>W2E - no SS</td>
<td>W2E - high SS</td>
<td>No MBT; no W2E</td>
<td></td>
</tr>
<tr>
<td>77%</td>
<td>84%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recyclers</td>
<td>W2E pre-treatment (mechanical)</td>
<td>Mechanical Biological Treatment (MBT)</td>
<td>Materials Recovery Facility (MRF)</td>
</tr>
<tr>
<td>Waste to energy</td>
<td></td>
<td>Open windrow</td>
<td>Enclosed composting</td>
</tr>
</tbody>
</table>
Meeting the 2020 MSW targets - estimated CAPEX ($mill)

- Estimated capital cost ($million)
  - Option 1
    - MBT to CLO - low SS: 64%
    - MBT to CLO - high SS: 65%
  - Option 2
    - MBT to RDF - low SS: 67%
    - MBT to RDF - high SS: 77%
  - Option 3
    - W2E - no SS: 78%
    - W2E - high SS: 84%
  - Option 4
    - No MBT; no W2E: 60%

- Processes:
  - C&D recycler (mixed)
  - C&D recycler (source-segregated)
  - Recyclers
  - MBT to RDF
  - MBT to CLO
  - W2E pre-treatment (mechanical)
  - Mechanical Biological Treatment (MBT)
  - Open windrow
  - Enclosed composting
  - Materials Recovery Facility (MRF)
<table>
<thead>
<tr>
<th>Option</th>
<th>MRF (150 ktpa)</th>
<th>Enclosed composting (50 ktpa)</th>
<th>Open windrow (100 ktpa)</th>
<th>MBT (150 ktpa)</th>
<th>Waste to energy (500 ktpa)</th>
<th>Putrescible LF (Mtpa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A) MBT to CLO - low SS</td>
<td>3</td>
<td>-</td>
<td>2</td>
<td>6</td>
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<tr>
<td>1B) MBT to CLO - high SS</td>
<td>3</td>
<td>10</td>
<td>1</td>
<td>2</td>
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<td>0.48</td>
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<tr>
<td>2A) MBT to RDF - low SS</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>9</td>
<td>2</td>
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<tr>
<td>2B) MBT to RDF - high SS</td>
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<td>7</td>
<td>1</td>
<td>6</td>
<td>1</td>
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<tr>
<td>3A) W2E - no SS</td>
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<td>-</td>
<td>1</td>
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<td>3</td>
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<tr>
<td>3B) W2E - high SS</td>
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<td>7</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>0.22</td>
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<tr>
<td>4) No MBT; no W2E</td>
<td>3</td>
<td>11</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>0.55</td>
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</table>
## Number of facilities – All streams

<table>
<thead>
<tr>
<th>Option</th>
<th>MRF (150 ktpa)</th>
<th>Enclosed composting (50 ktpa)</th>
<th>Open windrow (100 ktpa)</th>
<th>MBT (150 ktpa)</th>
<th>Waste to energy (500 ktpa)</th>
<th>Putrescible LF (Mtpa)</th>
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</thead>
<tbody>
<tr>
<td>1A) MBT to CLO - low SS</td>
<td>8</td>
<td>-</td>
<td>2</td>
<td>8</td>
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<td>1.82</td>
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<tr>
<td>1B) MBT to CLO - high SS</td>
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<td>12</td>
<td>1</td>
<td>3</td>
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<td>1.80</td>
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<tr>
<td>2A) MBT to RDF - low SS</td>
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<td>-</td>
<td>1</td>
<td>13</td>
<td>7</td>
<td>1.20</td>
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<tr>
<td>2B) MBT to RDF - high SS</td>
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<td>8</td>
<td>1</td>
<td>10</td>
<td>6</td>
<td>0.95</td>
</tr>
<tr>
<td>3A) W2E - no SS</td>
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<td>-</td>
<td>1</td>
<td>-</td>
<td>9</td>
<td>0.94</td>
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<tr>
<td>3B) W2E - high SS</td>
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<td>8</td>
<td>1</td>
<td>-</td>
<td>8</td>
<td>0.79</td>
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<tr>
<td>4) No MBT; no W2E</td>
<td>7</td>
<td>14</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1.94</td>
</tr>
</tbody>
</table>
Next steps

- Confirm existing capacity and estimate additional required capacity
- Estimate land requirements for each system option
- Full system cost estimates (collection, processing, disposal)
- Overall assessment of each system option
Feedback

For more information and feedback:

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