Barriers to Building and Construction Waste Reduction, Reuse and Recycling: A Case Study of the Australian Capital Region
This presentation

On behalf of

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Overview

• Purpose of the research
• Why the Capital Region?
• What we did?
• What we found?
Purpose of the research

• Arose due to concern of a single committed individual about the amount of C&D waste going to landfill.
## Research Outline

What is building and construction waste and how much is going to landfill and how much is being recycled?

<table>
<thead>
<tr>
<th>Issues with building and construction waste material in the Capital Region</th>
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<tbody>
<tr>
<td>Barriers to recycling, reusing and reducing waste in the Capital Region</td>
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<tr>
<td>Potential solutions: legislative, regulatory; financial incentives and disincentives; business development; media and information; education and training; procurement; demonstration projects; other.</td>
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<tr>
<td>Opportunities for Builders, Business and other stakeholders.</td>
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<tr>
<td>What next?</td>
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</table>
Why the Capital Region? Where is it?

- https://www.google.com.au/maps/@-35.3911931,149.1422579,1367162m/data=!3m1!1e3
What we did

- Desktop research
- Conducted Five workshops
- Face to face interviews and telephone surveys
- Email survey of builders
What is building and construction waste and how much is going to landfill and how much is being recycled?
We said ..

• “Any material from the building process which is used onsite as landfill or is transported offsite for reuse, recycling, or landfill elsewhere.”

• C&D waste generally includes soil (clean and contaminated), bricks, tiles, masonry, cement, timber, metals, plastics, paper and cardboard.

• We ignored the concepts of waste in manufacturing in terms of time and labour.
How Much Waste is produced in the building process of new residential dwellings?

- It depends on:
  - The type of build (brick veneer, full brick, timber, combinations etc.)
  - The numbers of homes being built (opportunities to take materials to the next site etc.)
  - Single residential home or multiple unit developments
  - Design, build method and materials used.

- A typical volume built Australian brick veneer house could generate up to **9,125kg** of waste (RMIT, 2014)
  - Mostly excess and offcuts of bricks and mortar, concrete roof tiles and plasterboard
  - Confirmed through surveys
Composition of demolition waste in typical Australian residential building

<table>
<thead>
<tr>
<th>Material</th>
<th>Asbestos fibro (tonnes)</th>
<th>Weatherboard (tonnes)</th>
<th>Brick veneer (tonnes)</th>
<th>Full brick (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos sheathing</td>
<td>1.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fittings</td>
<td>1</td>
<td>1</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Roof tiles*</td>
<td>5</td>
<td>5</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Plasterboard</td>
<td>2</td>
<td>2</td>
<td>2.5</td>
<td>1</td>
</tr>
<tr>
<td>Timber</td>
<td>5.3</td>
<td>7.2</td>
<td>9.6</td>
<td>6.9</td>
</tr>
<tr>
<td>Concrete, bricks, footings</td>
<td>20</td>
<td>50</td>
<td>120</td>
<td>180</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35</strong></td>
<td><strong>65</strong></td>
<td><strong>146</strong></td>
<td><strong>197</strong></td>
</tr>
</tbody>
</table>

Total C&D waste for the Capital Region

- The whole capital region generates about 400,000 tonnes of which about 200,000 (or half) is sent to landfill (about 1/3 or 35% comes from the ACT alone)
What is going to waste?

A NSW Study found:

An ACT study found:

Causes of Waste (from the literature)

- Design changes during construction, design inexperience, errors in measurements, incomplete or inaccurate contract documents, design inefficiency
- Procurement related – ordering errors
- Human related – damage, errors by trades, malfunction
- Physical – weather damage, inappropriate site storage, transportation damage
- Inefficient standard designs resulting in many off-cuts
- Material choices
Issues with building and construction waste in the Capital Region
• Lack of data on volume and composition of C&D – no weighbridges in regions, different measurement methods and different material inclusions
• Perception is waste not resource
• Variable regulations, fees, management between council areas and between local government and ACT Government
• Disposal location ‘shopping’
• Dumping
• Lack of suitable sites especially for soil disposal
• Lack of facilities for recycling
• Inconvenience of location of facilities
Barriers to increased recycling and reuse in the Capital Region
What the literature says

- Habit
- Not enough space on site
- Cost of sorting
- Time to sort
- Lack of facilities
- Lack of knowledge
- Planning requirements
- Specification of products
- Cost of disposal
- No demand for recycled materials
- Culture of oversupply
- Care factor
We found the same but more.....

- **Lack of knowledge** about what can be recycled or what recycling opportunities exist within the region;
- **Contamination** of recyclables due to lack of separation;
- Alternatives to recycling are less costly – **landfill gate prices are too low**;
- **Government policy** is not driving recycling;
- **Lack of communication** and industry infrastructure;
- **Alternatives to recycling** are less costly – **landfill gate prices are too low**;
- **Government policy** is not driving recycling;
- **Lack of communication** and industry infrastructure;
- **Low value products/low volume** products being **landfilled** rather than stored for recycling because it is uneconomic to stockpile;
- **C&D material is not** considered as a potential **resource** (except metal);
- **Environmental regulations** are working against recycling;
- **Lack of facilities** for recycling;
- **Inconvenience of location** of recycling facilities or need to take materials to many different places;
- **Material specification and certification** in buildings not encouraging recycling;
- **Lack of facilities to store soil** particularly VENM for reuse later; and
- **Different budget and management structures** between jurisdictions preventing cooperation in certain areas.
Top six barriers

- **Policy** – government’s are not driving recycling
- **Quality** – contamination of recyclables due to lack of sorting/separation
- **Cost** – landfill alternatives are cheaper
- **Information** – lack of information about facilities
- **Knowledge** – Lack of knowledge across the sphere
- **Perception and culture** – C&D material is not considered a resource.
Opportunities in recycling/reuse for builders, business, and other stakeholders in the Capital Region
For Builders....

- Safer tidier work place
- Pay less for disposal of waste
- Business reputation
- Business opportunities
For Business ...

- New business opportunities:
  - Education and training of membership/stakeholders
  - Professionalisation of workforce (waste managers)
  - New business in information supply
  - New business opportunities in brokering
  - New business opportunities in sorting and collection of material waste
For Government

• Employment and economic activity
• Reduction in landfill
• Improvement in environmental outcomes (eg. less dumping)
Potential solutions identified
Strategy

Policy and Governance related
- eg Regulation for take back
- Enforce WMP’s
- Use Government Procurement
- Star rating for new home construction

Information related
- eg Information App and map for ease of finding facilities

Knowledge, education and research related
- eg Develop a footprint of deconstruction to inform home owners
- Targeted media, education and training
- More scientific research
Our conclusions

• Significant barriers to recycling and reuse of C&D waste in the Capital Region
• Many of these barriers are shared throughout the world
• The ways to overcome the barriers lie in regulation, information, education and facilitation
What is next?

• Some of our innovative solutions are underway by governments and others are yet to be taken up, developed or tested.
  – Pricing and regulation is actively being examined by all jurisdictions
• Some more research is proposed – specifically case studies to demonstrate recycling practice
• The Business Chamber is taking up the challenge in terms of information dissemination.
• Still much more to go.
Thank you – any questions?