The Role of BIPV

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• Principally cladding, glazing and roofing
• Differentiated from BAPV (Building Added Photovoltaics)
• Huge range of commercial and residential applications
### BIPV Definitions

<table>
<thead>
<tr>
<th>Category A:</th>
<th>Sloped, roof-integrated, not accessible from within the building</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The PV modules are mounted in the building envelope at an angle of 0° - 75° with a barrier underneath preventing large pieces of glass falling onto accessible areas below</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category B:</th>
<th>Sloped, roof-integrated, accessible from within the building</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The PV modules are mounted in the building envelope at an angle of 0° - 75°</td>
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</table>

<table>
<thead>
<tr>
<th>Category C:</th>
<th>Non-sloped (vertically) mounted not accessible from within the building</th>
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<tbody>
<tr>
<td></td>
<td>The PV modules are mounted in the building envelope at an angle of 75° - 90° with a barrier behind preventing large pieces of glass or persons falling to an adjacent lower area</td>
</tr>
</tbody>
</table>
Solutions
Technology types
When compared to conventional solar (BAPV):

- Opportunity for lower costs
- Opportunity for greater total output

In addition, allows for:

- Thermal control
- Visual enhancement
In principle, the benefits are:

- Lower material costs
- Lower labour costs
- Opportunity for greater coverage
- “Zero net energy”
- Visually less intrusive
The hurdles

- Current costs too high
- Compatibility with labour market
- High product variability
- Grey zone in current certifications
- Technical considerations specific to BIPV
- Uncertainty over building code requirements
- Product awareness
- Political leadership
Market Breakdown:

- Research and Development – 3%
- Installations and customer service – 64%
- Manufacturing – 3%
- Distribution – 6%
- Utilities – 2%
• Under represented manufacturers

• BAPV has been focus of market

• Strong separation between both designers and installers of PV systems and conventional building construction

• BAPV required reduced skill set when compared to the range for BIPV
• Unclear what requirements must be met for BIPV
• AS5033 does not address specific BIPV conditions
• Unnecessary requirements carried over from BAPV systems
• Additional considerations for electrical safety, overheating
• Due to involvement at several stages of building process (siting, design, installation) engagement made more challenging

• Active engagement with installers required to achieve outcomes – Specialty Group, Bluescope
- Differing applications being pursued
  - Roofing solutions vs. façade and glazing
- Differing construction types
  - Larger proportion of subdivision developments
  - Lower spend on construction materials
- Very young market, rapidly expanding
  - 60MW in 2005, 2.1GW in 2012
  - Relatively small manufacturing base
  - Majority of stakeholders are installers
• Cost of solar modules reached point where sub-optimal installations are viable

• The more dispersed applications and greater range of products suits Australian market conditions

• Maturing of technology types allows for more confident design, better compatibility with construction industry expectations
• Creation for businesses to compete on more than just price
• Better synergies between construction and PV installation – less silo-ing
• Push towards more developed industry ecosystem
Why adopt BIPV?