Can disruptive innovations help stimulate end-user demand for a low carbon transition?

The SILCI Team
Emma Cassar
University of East Anglia

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disruptive low carbon innovations – fulfil both consumer need and a social need

• Disruptive
  • Displaces an existing product and/or service
  • Offers a new set of attributes to the consumer
  • Example – Car Clubs give consumers flexibility no maintenance or care obligations

• Attributes determine adoption rates – Rogers (2003)

• Potentially strengthen market demand and reduce greenhouse gas emissions if adopted at scale
**Disruptive low carbon innovations – Mobility**

'**Most disruptive’** and ‘lowest C’ mobility:

- Electric vehicles
- Mobility-as-a-Service
- Car Sharing

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Table 3. Potentially disruptive low carbon innovations relating to mobility. Note: * d/LCs included in survey of innovation experts, see below; * other d/LCs; ^ denotes additional low-carbon mobility strategies.

<table>
<thead>
<tr>
<th>type of innovation or strategy</th>
<th>potentially disruptive low C innovations or low C strategy</th>
<th>displaced incumbent</th>
</tr>
</thead>
<tbody>
<tr>
<td>alternative fuel or vehicle technology</td>
<td>* electric vehicles (EVs)</td>
<td>conventional ICE vehicles</td>
</tr>
<tr>
<td></td>
<td>* autonomous (self-driving) vehicles</td>
<td>conventional ICE vehicles</td>
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<tr>
<td></td>
<td>* fuel efficient ICEs</td>
<td>conventional ICE vehicles</td>
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<td></td>
<td>* hydrogen fuel cell vehicles</td>
<td>conventional ICE vehicles</td>
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<tr>
<td></td>
<td>* advanced biofuels</td>
<td>conventional ICE vehicles</td>
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<tr>
<td>alternative form of auto-mobility</td>
<td>* car clubs, car sharing</td>
<td>car ownership &amp; use</td>
</tr>
<tr>
<td></td>
<td>* mobility-as-a-service (MaaS)^</td>
<td>car ownership &amp; use</td>
</tr>
<tr>
<td></td>
<td>* ride-sharing</td>
<td>car ownership &amp; use</td>
</tr>
<tr>
<td>alternative to auto-mobility</td>
<td>* e-bikes</td>
<td>bikes, motorbikes</td>
</tr>
<tr>
<td></td>
<td>+ neighbourhood EVs</td>
<td>walking, public transport</td>
</tr>
<tr>
<td></td>
<td>~ modal shift to public transport</td>
<td>car use</td>
</tr>
<tr>
<td></td>
<td>~ active modes (walking, cycling)</td>
<td>car use, public transport</td>
</tr>
<tr>
<td>reduced demand for auto-mobility</td>
<td>* telecommuting, video- or teleconferencing</td>
<td>commuting</td>
</tr>
<tr>
<td></td>
<td>+ interactive virtual reality ^</td>
<td>commuting, teleconferencing</td>
</tr>
<tr>
<td></td>
<td>~ disappearing traffic c</td>
<td>road infrastructure</td>
</tr>
<tr>
<td></td>
<td>~ car-free communities</td>
<td>car-dependent suburbs</td>
</tr>
</tbody>
</table>

Mobility as a Service – Transforming how people in cities commute

• Planning, ticketing and payment in one single app

• Regional trials across Europe

• Early Adopters? Novel Attributes to the end user? Lower GHG emissions?
disruptive low carbon innovations – Studies that quantified emission reduction potentials

• International Transport Forum Studies
  • Replacing all motorised road trips with shared services
  • CO₂ emissions fell by 62% in Lisbon
  • CO₂ emissions for Helsinki Metropolitan Area fell by 28%

  International Transport Forum (ITF)
  ITF (2017) Shared Mobility Simulations for Helsinki. Paris, France
  International Transport Forum (ITF)

• RethinkX (US) study
  • Mobility as a Service using autonomous electric vehicles
  • Reduce CO₂ emissions by 90%

  Arbib & Seba (2017) Rethinking Transportation 2020-2030. RethinkX.
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The SILCI Team
Principal Investigator: Dr. Charlie Wilson
Senior researcher: Dr. Hazel Pettifor
PhD Researchers: Emma Cassar, Mark Wilson and Laurie Kerr

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