Abbreviations

CBA  Clay Brick Association
Cisco  Cape Town Iron and Steel Works
DBSA  Development Bank of Southern Africa
IIMP  Infrastructure Inputs Monitoring Project
IT  information technology
ITAC  International Trade Administration
     Commission of South Africa
LTMS  Long-term Mitigation Scenarios
MTEF  Medium-Term Expenditure Framework
NERSA  National Energy Regulator of South Africa
NIRP 2  National Integrated Resource Plan 2
PPC  Pretoria Portland Cement
PPI  producer price index
PPP  public-private partnerships
PRASA  Passenger Rail Agency of South Africa
REFIT  renewable energy feed-in tariff
Safcol  South African Forestry Company Limited
SANRAL  South African National Roads Agency Limited
SEIFSA  Steel and Engineering Industries
     Federation of South Africa
SIC  Standard Industrial Classification

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The Infrastructure Inputs Monitoring Project (IIMP) was initiated by the Presidency in 2006 to assess the increase in public sector demand and its impact on the supply of key infrastructure inputs. The IIMP was set up, in essence, to address the following concerns:

- There was, at that stage, insufficient comprehensive and integrated information available to advise the public and private sectors on the extent and nature of sector capacity required for the expanded infrastructure programme.
- Confidence in the projections and trends of infrastructure investment was insufficient to motivate substantial private sector investment in additional capacity.
- The available information was fragmented and difficult to access, and was found in different forms in different organisations and across a number of government structures.

In 2006, when the first IIMP study was commissioned, infrastructure expenditure was accelerating and supply shortages were emerging in a number of areas, including cement, bitumen and timber. The merit of the research was its ability to assess specific infrastructure inputs or components and any shortages that might arise. The 2008 update of the IIMP continued to focus on constraints to supply, but also reflected the impending downturn in demand (although it was completed just before the global economic crisis hit the South African economy).

The third round of the IIMP (2011) takes cognisance of the changes in the economic context, and caters for a number of different audiences with different needs. The research for the 2011 update was undertaken in a changing environment, in which there appears to be more constraints to the demand for public and private infrastructure than to supply (see section 5). But the supply side is the main focus of this research, and supply constraints and issues relating to supply across a range of sectors are highlighted in section 6.

This synthesis report summarises the main issues emerging from the 2011 update of the IIMP. It draws from the following reports:

- Infrastructure demand report;
- Infrastructure supply report and research manual; and
- A demand database and research manual.

Apart from summarising the main issues, the synthesis report also links the IIMP findings to related policy themes that could contribute to ongoing policy engagements. Section 7 outlines this and identifies some policy and research themes that might be relevant in carrying the IIMP process beyond 2011.

The next section reflects on the purpose and added value of this exercise, while the framework of the IIMP supply and demand model is discussed in section 3. The summary highlights the disaggregated components of public sector expenditure and the indicative cumulative demand for a range of input materials.

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1 The lead researcher on the IIMP 2011 was Dr Zavareh Rustomjee.
Building on earlier IIMP work, the 2011 IIMP has adopted a more rigorous, empirically based methodology, particularly on the demand side. Demand data for public sector infrastructure has been drawn from detailed National Treasury budgeting and reporting systems, and is disaggregated by infrastructure type and according to spending institutions at national, provincial and municipal level. Private sector ‘infrastructure’ expenditure has been recorded at the three-digit Standard Industrial Classification (SIC) sector level. The methodology used for the 2011 IIMP will greatly simplify updates, allowing future IIMP investigations to delve into more substantial issues influencing both infrastructure demand and supply at a very detailed sectoral level.

It is expected that subsequent IIMP updates will continue to improve the accuracy and coverage detail for both the demand and the supply side.

The original 2006 IIMP was done at a time of accelerating infrastructure investment amid concerns about the capacity of supply industries to respond to the increased demand; hence, its main objective was to identify supply constraints. By 2011, demand had been tempered and fewer supply constraints occurred, as expected.

The 2011 IIMP will be updated annually and will be useful to a range of public and private entities that require relatively accurate disaggregated data on future expenditure trends on infrastructure subsectors. The data on supply industries, together with the identification of issues affecting the capacity to supply, will be equally useful as credible inputs to the development of corporate strategy and public policy.

The 2011 dashboard is not compatible with the 2008 IIMP review because the economy is still recovering from the post-2008 downturn and most sectors have significant supply capacity for the foreseeable future.

The dashboard, therefore, focuses on the main issues in 2011, relating the demand for specific infrastructure types and the supply of specific inputs.
<table>
<thead>
<tr>
<th>Key supply sector</th>
<th>2011 issues influencing supply</th>
<th>Relative importance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Steel</strong></td>
<td>Dominance of one supplier – periodic shortages of key steel products, e.g. rebar</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Electricity price increases adversely affecting mini-mill production economics</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Scrap metal exports adversely affecting domestic availability of mill feedstock</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Domestic demand recovery and growth</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Capacity utilisation</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Steel pricing and competition issues</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>New investment in primary steel production</td>
<td>●</td>
</tr>
<tr>
<td><strong>Aluminium</strong></td>
<td>Aluminium extrusion capacity</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Aluminium input costs</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Import competition</td>
<td>●</td>
</tr>
<tr>
<td><strong>Aluminium</strong></td>
<td>Availability of scrap aluminium feedstock</td>
<td>●</td>
</tr>
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<td></td>
<td>Planned closure of Bayside slab plant in 2012</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Competitiveness of the local casting industry</td>
<td>●</td>
</tr>
<tr>
<td><strong>Cement and cement products</strong></td>
<td>Consensus view on demand forecasting and supply capacity</td>
<td>●</td>
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<tr>
<td></td>
<td>Cost pressures impeding timely investment in increasing capacity</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Electricity, transport and logistics costs and reliability</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Inability of ageing downstream plants to conform with increasingly stringent implementation of environmental legislation</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Compliance and enforcement regulations around quarrying and mining operations</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Overall economic downturn – reduction in fixed investment in buildings</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Delays in government tender awards</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Availability of key skills</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Import competition and dumping</td>
<td>●</td>
</tr>
<tr>
<td><strong>Sand and aggregates</strong></td>
<td>Regulation</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Mineral and Petroleum Resources Development Act</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Electricity availability and cost</td>
<td>●</td>
</tr>
<tr>
<td><strong>Bricks</strong></td>
<td>Energy costs</td>
<td>●</td>
</tr>
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<td>Transport costs</td>
<td>●</td>
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<tr>
<td></td>
<td>Mineral rights and other regulations governing mining</td>
<td>●</td>
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<td>Environmental impact assessment processes</td>
<td>●</td>
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<td></td>
<td>Energy-efficient brickmaking technologies</td>
<td>●</td>
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<td>Alternative steel structures</td>
<td>●</td>
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<td><strong>Timber</strong></td>
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<td>●</td>
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<td>Pricing of inputs – administered prices</td>
<td>●</td>
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<td>Labour legislation – minimum wages</td>
<td>●</td>
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<td></td>
<td>Land restitution and claims</td>
<td>●</td>
</tr>
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<td>Land reform policy</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Success of the Department of Trade and Industry’s Industrial Policy Action Plan for Forestry and Timber (March 2008)</td>
<td>●</td>
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<tr>
<td></td>
<td>Privatisation of the South African Forestry Company Limited (Safcol)</td>
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</tr>
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<td><strong>Glass</strong></td>
<td>Energy costs</td>
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<tr>
<td></td>
<td>Import competition</td>
<td>●</td>
</tr>
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<td>Input polymer pricing</td>
<td>●</td>
</tr>
<tr>
<td><strong>Bitumen</strong></td>
<td>Supply availability</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Predictability in demand forecasting</td>
<td>●</td>
</tr>
<tr>
<td><strong>Capital equipment</strong></td>
<td>Skills</td>
<td>●</td>
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<td></td>
<td>Material inputs</td>
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<td>Infrastructure type and budget allocation for 2011</td>
<td>2011 issues influencing demand</td>
<td>Relative importance</td>
</tr>
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<td>-------------------------------------------------</td>
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<td>---------------------</td>
</tr>
<tr>
<td>Building and construction R56 billion</td>
<td>Importance of building and construction</td>
<td>■</td>
</tr>
<tr>
<td></td>
<td>Improvements in building project execution capabilities at provincial and local government level</td>
<td>■</td>
</tr>
<tr>
<td></td>
<td>Public-private partnerships (PPPs)</td>
<td>■</td>
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<tr>
<td></td>
<td>Housing infrastructure</td>
<td>■</td>
</tr>
<tr>
<td>Roads R46 billion</td>
<td>Provincial expenditure – budgeted vs actual</td>
<td>■</td>
</tr>
<tr>
<td></td>
<td>Addressing road maintenance backlogs</td>
<td>■</td>
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<tr>
<td></td>
<td>Toll road project timelines</td>
<td>■</td>
</tr>
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<td></td>
<td>Municipal expenditure – budgeted vs actual</td>
<td>■</td>
</tr>
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<td>The rate at which backlogs in regional bulk water and municipal sanitation infrastructure are addressed</td>
<td>■</td>
</tr>
<tr>
<td>Telecommunications R3 billion</td>
<td>Square Kilometre Array bid</td>
<td>■</td>
</tr>
<tr>
<td>Energy R125 billion</td>
<td>Energy regulation changes</td>
<td>■</td>
</tr>
<tr>
<td></td>
<td>Investment in electricity distribution industry</td>
<td>■</td>
</tr>
<tr>
<td></td>
<td>National Integrated Resource Plan 2 (NIRP 2) generation technology options and associated Long-term Mitigation Scenarios (LTMS) issues</td>
<td>■</td>
</tr>
<tr>
<td></td>
<td>CEF and liquid fuels sector investments</td>
<td>■</td>
</tr>
<tr>
<td>Transport R29 billion</td>
<td>Regulation of freight logistics tariffs</td>
<td>■</td>
</tr>
<tr>
<td></td>
<td>Passenger Rail Agency of South Africa (PRASA) – financing of infrastructure</td>
<td>■</td>
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<tr>
<td></td>
<td>Industrial development zone policy</td>
<td>■</td>
</tr>
<tr>
<td></td>
<td>Human settlement policy success</td>
<td>■</td>
</tr>
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</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
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<td></td>
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<td>■</td>
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<tr>
<td></td>
<td>Passenger Rail Agency of South Africa (PRASA) – financing of infrastructure</td>
<td>■</td>
</tr>
<tr>
<td></td>
<td>Industrial development zone policy</td>
<td>■</td>
</tr>
<tr>
<td></td>
<td>Human settlement policy success</td>
<td>■</td>
</tr>
</tbody>
</table>
The 2011 IIMP disaggregates overall public sector infrastructure expenditure into seven broad infrastructure categories. One important reason for this is that different types of infrastructure require different supply inputs. Second, different factors affect the pace and quantum of expenditure for each of these infrastructure types. As outlined in Table 2, expenditure on public infrastructure is expected to grow from R273 billion in 2010/11 to R344 billion in 2013/14.

### Table 2: Public sector infrastructure expenditure by infrastructure type, 2010/11–2013/14 (R million)

<table>
<thead>
<tr>
<th>Estimated expenditure</th>
<th>2010/11</th>
<th>2011/12</th>
<th>2012/13</th>
<th>2013/14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings and construction</td>
<td>38 031</td>
<td>47 287</td>
<td>70 539</td>
<td>82 027</td>
</tr>
<tr>
<td>Housing</td>
<td>18 156</td>
<td>21 440</td>
<td>23 489</td>
<td>25 101</td>
</tr>
<tr>
<td>Roads</td>
<td>45 971</td>
<td>43 250</td>
<td>43 292</td>
<td>38 476</td>
</tr>
<tr>
<td>Water and sanitation</td>
<td>20 992</td>
<td>25 872</td>
<td>24 325</td>
<td>27 100</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>2 035</td>
<td>1 572</td>
<td>820</td>
<td>1 071</td>
</tr>
<tr>
<td>Electricity and energy</td>
<td>125 290</td>
<td>137 611</td>
<td>141 968</td>
<td>144 767</td>
</tr>
<tr>
<td>Transport</td>
<td>23 366*</td>
<td>23 924</td>
<td>22 796</td>
<td>25 891</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>273 841</td>
<td>300 955</td>
<td>327 229</td>
<td>344 431</td>
</tr>
</tbody>
</table>

* An amount of R44.2 million has been identified for transport and storage, but it is not clear whether the amount was spent by the private and/or public sector. In order to avoid double counting, it was excluded.

Initially, the IIMP attempted to assess private sector expenditure on infrastructure from published analyses such as the Nedbank Capital Projects Register and the *Engineering News* projects section. However, these compilations, while providing a good overview, are not empirically consistent from year to year and involve considerable subjective judgement.

Ultimately, the 2011 IIMP used the Quantec database at the three-digit SIC level. It assumes that private sector expenditure on infrastructure consists of recorded gross domestic fixed investment in the specific economic sectors outlined in Table 3, with expenditure spread across three major supply sectors, namely building and construction, machinery and equipment, and transport equipment.

Public and private expenditure on infrastructure forms a significant proportion of total gross domestic fixed investment, accounting for almost R312 billion of a total R365 billion in 2010 (at constant 2005 prices), as outlined in Table 3.

Table 4 demonstrates the following:

- Total public expenditure on infrastructure almost matched total private expenditure in 2010, with greater public expenditure on building and construction and greater private expenditure on machinery and equipment.
- Quantec figures for public sector expenditure on infrastructure are lower overall than those recorded by the National Treasury, with varying differences for building and construction, machinery and equipment, and transport equipment. The reasons for this probably lie with the Quantec methodology for classifying and allocating different components of expenditure.
- A large part of total supply of R501 billion from building and construction, machinery and

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2 The Quantec database figures for public sector expenditure, at constant 2005 prices, are not directly comparable with estimates of public sector infrastructure drawn from National Treasury data, which are expressed in current prices.
The 2011 IIMP has attempted to convert the full rand value of infrastructure expenditure into demand for specific input materials, goods, services and requisite labour skills. This has been done separately for different types of infrastructure expenditure, such as roads, buildings, transport and water infrastructure, as summarised in the IIMP database, which will be available from April 2012 at www.dbsa.org.

The following issues are pertinent in interpreting the findings of the IIMP:

a) While the accuracy of the information has improved, the output should be treated as indicative and regarded as a work in progress.

### Table 3: Estimates of private infrastructure investment at constant 2005 prices, 2010 (R million)

<table>
<thead>
<tr>
<th>Private infrastructure investment</th>
<th>Total</th>
<th>Building and construction</th>
<th>Machinery and equipment</th>
<th>Transport equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold and uranium mining</td>
<td>11 111</td>
<td>6 890</td>
<td>3 854</td>
<td>367</td>
</tr>
<tr>
<td>Coal mining</td>
<td>10 660</td>
<td>5 506</td>
<td>4 160</td>
<td>392</td>
</tr>
<tr>
<td>Other mining</td>
<td>21 397</td>
<td>11 318</td>
<td>8 439</td>
<td>1 640</td>
</tr>
<tr>
<td>Coke and refined petroleum products</td>
<td>9 651</td>
<td>985</td>
<td>8 633</td>
<td>34</td>
</tr>
<tr>
<td>Basic chemicals</td>
<td>5 640</td>
<td>162</td>
<td>5 443</td>
<td>35</td>
</tr>
<tr>
<td>Other chemicals and manmade fibres</td>
<td>2 714</td>
<td>655</td>
<td>2 038</td>
<td>20</td>
</tr>
<tr>
<td>Basic iron and steel</td>
<td>2 168</td>
<td>521</td>
<td>1 634</td>
<td>13</td>
</tr>
<tr>
<td>Finance and insurance</td>
<td>20 441</td>
<td>12 197</td>
<td>4 687</td>
<td>3 556</td>
</tr>
<tr>
<td>Business services</td>
<td>37 523</td>
<td>22 390</td>
<td>8 605</td>
<td>6 529</td>
</tr>
<tr>
<td>Communication</td>
<td>20 680</td>
<td>7 485</td>
<td>4 634</td>
<td>8 561</td>
</tr>
<tr>
<td>Wholesale and retail trade</td>
<td>22 249</td>
<td>4 733</td>
<td>11 784</td>
<td>5 732</td>
</tr>
<tr>
<td><strong>Total private sector infrastructure investment</strong></td>
<td><strong>163 634</strong></td>
<td><strong>72 844</strong></td>
<td><strong>63 911</strong></td>
<td><strong>26 879</strong></td>
</tr>
<tr>
<td><strong>Total public sector infrastructure investment</strong></td>
<td><strong>148 273</strong></td>
<td><strong>104 798</strong></td>
<td><strong>39 414</strong></td>
<td><strong>3 561</strong></td>
</tr>
<tr>
<td><strong>Total public and private infrastructure investment</strong></td>
<td><strong>311 907</strong></td>
<td><strong>177 642</strong></td>
<td><strong>103 325</strong></td>
<td><strong>30 640</strong></td>
</tr>
<tr>
<td>Other private (non-infrastructure) fixed investment</td>
<td>53 425</td>
<td>53 425</td>
<td>53 425</td>
<td>53 425</td>
</tr>
<tr>
<td><strong>Total gross domestic fixed investment</strong></td>
<td><strong>365 332</strong></td>
<td><strong>187 828</strong></td>
<td><strong>121 188</strong></td>
<td><strong>36 316</strong></td>
</tr>
</tbody>
</table>

Source: Quantec.

### Table 4: Public and private sector infrastructure, 2010 (R million)

<table>
<thead>
<tr>
<th>Private infrastructure investment</th>
<th>Total</th>
<th>Building and construction</th>
<th>Machinery and equipment</th>
<th>Transport equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treasury Medium-Term Expenditure Framework (MTEF) data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public sector infrastructure expenditure (current prices)</td>
<td>262 642</td>
<td>133 066</td>
<td>114 691</td>
<td>14 885</td>
</tr>
<tr>
<td>Public sector infrastructure expenditure (constant 2005 prices)</td>
<td>181 223</td>
<td>91 815</td>
<td>79 137</td>
<td>10 271</td>
</tr>
<tr>
<td><strong>Quantec data for 2010</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public sector infrastructure expenditure – Quantec (constant 2005 prices)</td>
<td>148 273</td>
<td>104 798</td>
<td>19 714</td>
<td>23 761</td>
</tr>
<tr>
<td>Private sector infrastructure expenditure (constant 2005 prices)</td>
<td>163 634</td>
<td>72 844</td>
<td>63 911</td>
<td>26 879</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>311 907</strong></td>
<td><strong>177 642</strong></td>
<td><strong>83 625</strong></td>
<td><strong>30 640</strong></td>
</tr>
<tr>
<td>% public</td>
<td>60.3</td>
<td>24.2</td>
<td>51.3</td>
<td></td>
</tr>
<tr>
<td>% private</td>
<td>39.7</td>
<td>75.8</td>
<td>48.7</td>
<td></td>
</tr>
<tr>
<td><strong>Total output of sector (+ imports – exports) (constant 2005 prices)</strong></td>
<td><strong>501 240</strong></td>
<td><strong>142 986</strong></td>
<td><strong>149 636</strong></td>
<td><strong>208 618</strong></td>
</tr>
</tbody>
</table>

* Producer price index (PPI) deflator: 0.69.
Source: Quantec and National Treasury.
b) Many assumptions have been made in converting the rand value of expenditure into specific infrastructure inputs. Where possible, the assumptions have been obtained from spending agencies that track this kind of data. In other cases, best attempts have been made to estimate the conversions.
c) The resulting model has been captured in an electronic database.
d) Depending on the perceived need, the model could be further refined and developed for forecasting and other purposes.

This section of the report is organised according to the seven different infrastructure types, i.e. buildings and construction, housing, roads, water, ICT, energy and transport, with a summary of the key issues affecting each type.

The 2011 IIMP has attempted to convert the full rand value of infrastructure expenditure into demand for specific input materials, goods, services and requisite labour skills.

5 Demand issues in 2011

5.1 Importance of building and construction

Government expenditure on buildings plays a consistent underpinning role in national fixed investment. Figure 1 shows a cyclical pattern, fluctuating around 11.5% of gross domestic fixed investment, over a decade during which total real expenditure almost doubled from R28.5 billion in 2001 to R48.6 billion in 2010.

Private expenditure on buildings (see Figure 2) also constitutes a large part of private sector fixed investment and is spread across individual sectors, with a significant contribution by the finance and insurance and business services sectors.

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Despite cyclical growth patterns, between 30% and 35% of public and private gross domestic fixed investment is spent annually on labour-intensive building and construction activities, activities that have strong backward linkages with input industries.
5.4 Housing infrastructure

Two recent policy thrusts may help to accelerate housing infrastructure expenditure. First, the devolution of the housing function to local government, which is also responsible for other infrastructure components of the built environment, is likely to lead to better coordination around human settlements and more sustainable demand for housing infrastructure. Second, the Department of Human Settlement’s housing finance initiatives, if successful, are likely to result in an increasing share of housing being privately funded and a corresponding increase occurring in housing demand and associated inputs to housing. The latter demand will be reflected in private sector building and construction statistics. For purposes of this study, housing inputs were calculated using a standard template of input materials for 40 m² units.

5.5 Roads infrastructure

Expenditure on roads constitutes a large part of public infrastructure expenditure. Infrastructure expenditure on national roads is the responsibility of the South African National Roads Agency Limited (SANRAL). Provincial departments are responsible for provincial roads, while municipalities are responsible for municipal roads. A significant proportion of public infrastructure expenditure is allocated to roads, as shown in Table 6.

The next section sets out issues that affect road infrastructure demand.

### Provincial expenditure

The largest budgeted component of overall road expenditure is provincial roads. In 2010/11, the roads component of the Treasury-administered Infrastructure

### Table 6: Road infrastructure demand, 2010/11–2013/14 (R million)

<table>
<thead>
<tr>
<th></th>
<th>2010/11</th>
<th>2011/12</th>
<th>2012/13</th>
<th>2013/14</th>
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</thead>
<tbody>
<tr>
<td>Provincial roads</td>
<td>17 806</td>
<td>18 256</td>
<td>19 057</td>
<td>19 963</td>
</tr>
<tr>
<td>SANRAL (not toll)</td>
<td>6 845</td>
<td>8 757</td>
<td>10 531</td>
<td>11 273</td>
</tr>
<tr>
<td>SANRAL (toll roads)</td>
<td>8 387</td>
<td>2 593</td>
<td>1 984</td>
<td>1 487</td>
</tr>
<tr>
<td>SANRAL (PPP private component)</td>
<td>6 604</td>
<td>4 493</td>
<td>2 968</td>
<td>1 967</td>
</tr>
<tr>
<td>Municipal roads</td>
<td>6 329</td>
<td>9 151</td>
<td>8 752</td>
<td>3 785</td>
</tr>
<tr>
<td>Total</td>
<td>45 971</td>
<td>43 250</td>
<td>43 292</td>
<td>38 476</td>
</tr>
</tbody>
</table>
Grant to Provinces was transferred to the budget of the Department of Transport under the Provincial Roads Maintenance Grant. A large part of provincial roads funding comes from this grant.

In addition, provinces allocate a sizeable portion, an additional R8.0 billion, of equitable share funding to supplement the R6.1 billion grant funding for road infrastructure.

However, it has been suggested that actual provincial expenditure on road infrastructure is considerably lower than the budgeted figures, with the indicated equitable share of funds being diverted to other activities.

### Addressing road maintenance backlogs

The major challenge confronting South Africa’s road network is the significant backlog in road maintenance and rehabilitation. Over 75% of the current road network is now 20 years old or older, and it is estimated that more than R75 billion is needed to address this situation over the next five years. While road allocations are increasing, the road system is degrading at a current rate of approximately R10.5 billion per year. Failure to reverse this will result in the accelerated deterioration of roads. Demand for inputs will be affected by the pace at which a systematic programme is put in place to address the neglect of road maintenance.

### Toll road project timelines

Impending SANRAL toll road projects include:

- **N1–N2 Winelands Toll Highway (171 km)** – this is set to start in 2012.
- **N2 Wild Coast Toll Highway (560 km)** – the Department is still awaiting the outcome of environmental impact assessment appeals lodged with the Minister of Environmental Affairs.
- **R300 Cape Town Ring Road (105 km)** – the Department is finalising the environmental impact assessment.
- **R30 Bloemfontein to Welkom (160 km)** – this is presently under construction.
- **N3 Marianhill to Cedara (90 km)** – the Department is conducting an environmental impact assessment.
- **N2 Knysna Bypass (35 km)** – the Department is awaiting environmental impact assessment approval from the Minister of Environmental Affairs.

Projected demand for road inputs will depend on the extent to which the above projects are executed on time. The controversy raised by the proposed toll tariffs for the recently completed Gauteng Freeway Improvement Project has resulted in a delay in finalising the tariffs. Court action has also halted progress on the Winelands Toll Road. These developments have raised the question of whether the tolling model can be sustained, and may have a significant adverse impact on future capital expenditure on road infrastructure. The ability of SANRAL to float bonds successfully on the capital markets has already been affected.

### 5.6 Water

There is considerable public expenditure on water infrastructure via the various institutions responsible for bulk water supply, regional water supply, and municipal purification, reticulation and sewerage. The section below outlines issues that affect water infrastructure demand.

#### Municipal expenditure

Municipalities report significant expenditure through their S71 returns, at the request of the National Treasury. However, the Department of Water Affairs believes that municipalities over-report expenditure on the S71 returns, and that actual expenditure is lower. Should this be the case, supply industries need to be cautious about how they use this data.

#### Addressing regional bulk water and municipal sanitation infrastructure backlogs

The Department of Water Affairs has budgeted about R5.4 billion over the MTEF period to start to address the estimated R60 billion backlog in regional bulk water and sanitation infrastructure owned by municipalities, including water and wastewater treatment plants. It is not clear how much additional off-balance-sheet capital the Department of Water Affairs budget will leverage, but it is possible that the eradication of
the backlogs might be accelerated, in which case there will be greater demand for inputs.

5.7 Energy infrastructure

A considerable part of public infrastructure expenditure is allocated to the electricity and hydrocarbon fuel sectors. The section below outlines issues that will influence future demand.

Energy regulation changes

Encouraging investment by private, independent power producers into the electricity sector requires greater certainty about energy regulation. The government introduced renewable energy feed-in tariffs (REFIT) to make investment in the renewable energy industry more attractive to the private sector. However, REFIT has since been replaced by the procurement programme for independent power producers, which calls for competitive bids based on a price ceiling determined by the REFIT guidelines. It also requires economic development criteria to be met, including local content.

These changes will increase investment into the electricity sector and induce further demand from input suppliers. The first renewable energy window is currently moving according to schedule and the second window will open in March.

Investment in the electricity distribution industry

Although Cabinet has scrapped the earlier policy to consolidate electricity distribution into six wall-to-wall regional electricity distributors, the estimated backlog in distribution infrastructure of R27 billion still requires financing. Once clarity emerges on how this is to be done, it is likely to induce significant demand from input sectors.

NIRP 2 generation technology options and associated LTMS issues

South Africa’s recently announced emission reduction targets, together with the NIRP 2, will require decisions in the near term on what generation technologies are to be the main base-load providers. These decisions will have an impact on input supply industries. The nuclear procurement programme is planned to begin in 2012.

CEF and liquid fuels sector investments

The IIMP assumes that the proposed Mthombo greenfield crude oil refinery at the port of Coega is the main CEF project listed. However, the Minister of Energy indicated in her budget speech in May 2011 that the scope of the project was to be reviewed to consider the process outlined by the Department of Energy to finalise clean fuels specifications by December 2011. The proposed CEF investments are, therefore, likely to be pushed into future years.

5.8 Transport

The quantum of transport infrastructure is dominated by transport systems required to support industry. Public transport constitutes a much smaller component of annual expenditure on transport infrastructure. The section below outlines issues likely to influence transport infrastructure.

Regulation of freight logistics tariffs

In January 2011, the recently established ports regulator denied Transnet Port Authority’s request for an 11.9% increase, instead capping the increase at 4.5%. At the same time, the Minister of Transport initiated an inquiry into the huge cost escalation of the New Multi-Product Pipeline, while the National Energy Regulator of South Africa (NERSA) also rejected Transnet Pipelines’ requested pipeline tariff increase. It is likely that the emerging utility regulatory institutions will continue to take a tough stance against any attempted abuse of Transnet’s dominant position in freight logistics; this is likely to have a dampening effect on planned transport infrastructure demand.

PRASA – financing of infrastructure

In April 2011, PRASA announced a R97 billion procurement plan for upgrading rolling stock and other passenger rail infrastructure. It is unclear how PRASA’s planned public transport infrastructure expenditure is to be financed, as such amounts are not covered by the national budget at this stage.

Industrial development zone policy

Although the planned expenditure on infrastructure for industrial development zones is comparatively smaller than PRASA’s planned expenditure, it is
dependent on the successful execution of the policy on industrial development zones. Recently, questions have been raised about the extent to which industrial development zone programmes have delivered on their objectives. The publication of the Green Paper on Special Economic Zones and the reported support for the policy across government may go some way towards resolving these questions and creating certainty.

**Human settlement policy success**

The formalisation of informal settlements, the accessing of new settlement land closer to places of employment, and the densification of human settlements in urban and peri-urban areas are likely to provide impetus for public transport infrastructure demand.

Investigate information technology demand and supply in more detail

Annual public sector expenditure on information technology (IT) hardware and software is considerable. The National Treasury does not explicitly classify such expenditure as infrastructure in compiling the annual Estimates of national expenditure.

...transport infrastructure is dominated by transport systems required to support industry. Public transport constitutes a much smaller component of annual expenditure on transport infrastructure.

### 6 Supply issues in 2011: Introduction and methodology

The supply situation for the following key inputs into infrastructure is reflected below:

- Steel
- Aluminium
- Cement
- Concrete products
- Bricks
- Timber
- Glass
- Plastic pipes
- Aggregates and sand
- Bitumen
- Capital equipment

In line with previous IIMP reports, for each of the above inputs, the full supply side report identifies the main published data sources and extracts the most recent data for these inputs. Based on published information and selected interviews, each section of the report identifies and discusses the key issues affecting the ability of the specific sector to supply current and future infrastructure demand requirements. The comprehensive supply and demand-side reports are available on request from the DBSA.

#### 6.1 Supply constraints in 2011

Following the 2008 global economic crisis, private infrastructure expenditure dropped significantly. Public expenditure, which had been rising up until 2008, stabilised. In the case of Eskom and Transnet, the timelines for a number of projects were shifted back, resulting in lower capital expenditure than previously planned. Consequently, many of the supply industries also reduced output, leaving considerable production capacity available.

Despite this, supply constraints are anticipated for specific inputs relating to bitumen and steel rebar. Some of these constraints can be addressed by increasing domestic production. In the case of timber, even if the identified constraints to increased domestic
supply are overcome, it is unlikely that domestic supply will be able to meet domestic needs in the short or medium term.

**Bitumen**
Since the scheduling of refinery shutdowns was not synchronised with bitumen demand, shortages were experienced in 2010, which caused delays in the Gauteng Freeway Improvement Project, among others.

**Steel rebar**
The failure of one of ArcelorMittal’s Newcastle plant furnaces in July 2010 resulted in periodic shortages of reinforcing bar and other specific steel products in the last quarter of 2011.

Should demand for infrastructure inputs suddenly increase and domestic supply capacity be reached, IIMP 2011 indicates that shortages can mostly be averted by imports, although some inputs may require longer lead times than others.

### 6.2 Steel
Primary steel production is concentrated around five facilities located in the Witwatersrand industrial heartland. The three exceptions are the ArcelorMittal Saldanha steel plant, located at the Saldanha harbour in the Western Cape (and largely export-oriented), ArcelorMittal’s Newcastle works, and the Cape Town Iron and Steel Works (Cisco) scrap-based steel mill and steel product plant. The following page highlights key trends in the supply, demand, capacity utilisation, trade and investment issues impacting steel.

Steel supply from domestic plants has exceeded demand since the mid-1970s, with exports consistently running in excess of 40% of total production until 2006. Since then, an increasing proportion of exports have been diverted into the growing domestic market.

**Key issues affecting steel supply**

**Market dominance in the sector – periodic shortages of key steel products**
The supply of specific steel product inputs is concentrated in one or two suppliers. Any unplanned disruption to supply can lead to periodic shortages of products, which can be alleviated by imports. However, such imports require a lead time of several months, depending on the particular product.

**Electricity price increases and scrap metal availability**
Some producers of specific steel products use scrap-fed electric furnaces and are more vulnerable to rising electricity prices. High global steel prices are fuelling increased scrap exports, which then reduce the scrap available domestically for reprocessing.

**Domestic demand recovery and growth**
Slow recovery from the 2008 global economic crisis resulted in poor steel sales and lower earnings for ArcelorMittal in the quarter ending September 2010, with the company citing private mining and agricultural sector demand weakness. However, by mid-2011, the demand outlook was more positive. In the first quarter of 2011, ArcelorMittal registered a 36% increase in domestic sales volumes, a 6% increase in average rand selling prices, and a 20% rise in liquid steel production, despite significant production problems at its Vanderbijlpark and Newcastle works.

**Capacity utilisation**
ArcelorMittal’s capacity utilisation increased further in the first quarter of 2011, after rising from 66% to 71% during 2010. This still leaves considerable room for more domestic growth.

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3. [www.businessday.co.za/Articles/Content.aspx?id=124981](http://www.businessday.co.za/Articles/Content.aspx?id=124981)
Steel pricing and competition issues

ArcelorMittal is the dominant steel market leader. There has been an ongoing dispute between the company and the Department of Trade and Industry over its pricing model, which, the Department argues, raises the cost of steel-intensive downstream activities like construction, mining and manufacturing. Studies by Corporate Strategy and Industrial Development have shown that a 25% reduction in the average price of steel could result in a very significant expansion of downstream steel-intensive industries.

New investment in primary steel production

While existing producers are not planning any major new capacity investments, there have been reports of planned investments by the Steel Authority of India. Introducing a competitor to ArcelorMittal in the domestic market is a stated industrial policy objective of the Department of Trade and Industry. The recent court proceedings over the disputed mineral rights that were part of the agreement to unbundle Iscor in 2002 have served to muddy the terrain. Given all of this, from the IIMP perspective, it appears unlikely that a new domestic supplier will emerge in the near future to increase overall supply.

6.3 Aluminium

The factors outlined below may constrain aluminium supply over the next period.

Aluminium extrusion capacity

Previous IIMP studies suggest that the domestic aluminium extrusion capacity of 81 kilotons will reach its limit by 2012.

Aluminium input costs

Aluminium billets constitute some 50% to 70% of the input cost of aluminium extruding and fabrication, with import parity pricing resulting in significant price rises in line with global prices. Partly because of such pressures, one of the larger extruders, AG Industries, went into liquidation in 2010.

Import competition

During 2010, the Aluminium Extruders Association applied for a 15% protective tariff on extruded aluminium products. The International Trade Administration Commission of South Africa (ITAC) granted a 5% tariff increase. In 2011, Hulamin applied for a 10% duty on imports of semi-fabricated rolled aluminium products. ITAC is still evaluating this application.

Availability of scrap aluminium feedstock

The secondary aluminium industry (foundries) depends on local scrap aluminium for its feedstock. Global scrap prices have soared, undermining the viability of the secondary industry value chain. In addition, the export of scrap is leading to shortages in the domestic market.

In 2010, the Steel and Engineering Industries Federation of South Africa (SEIFSA) applied for a 40% duty to be imposed on scrap exports. ITAC is evaluating the matter.

Planned closure of Bayside slab plant in 2012

BHP Billiton closed its billet casting facility at Bayside in October 2009. Billets are the main input (50% to 70% of cost) into the extrusion process, and this resulted in extruders having to import their billets.

In 2010, BHP Billiton announced its intention to close its casting plant, producing aluminium slab, at Bayside in 2011. The planned closure was shifted to 2012, following negotiations with its main customer, Hulamin. Hulamin had already made an R75 million investment to expand its in-house casting capacity to 50,000 tons per year, and appears able to manage once Bayside ceases operation.

Competitiveness of the local casting industry

South Africa’s casting industry is very diverse and, in a number of areas, lacks economies of scale. It is regarded as a strategic sector of industry and is the subject of a targeted government support programme aimed at improving competitiveness and building human resource capacity.
6.4 Cement

This section briefly outlines the main issues that will influence cement and cement product supply.

Consensus view on demand forecasting and supply capacity

Acute cement shortages were experienced in 2007/08, despite all the earlier signs indicating that cement demand would rise significantly. The industry response then was to import significant quantities of cement and to reorganise its supply chains to accommodate the imports into coastal markets. This caused costs to rise.

2011 cement demand is significantly below the 2008 peak, and also below current supply capacity. There seems to be consensus within the supply industry that market growth will be between 3% and 5% over the next few years. However, estimates of the supply capacity of the current ageing plant range from 14.5 million to 17 million tons. In addition, tightening environmental legislation and rising energy costs are eroding the profitability of these plants.

Cost pressures impeding timely investment in increasing capacity

Firms argue that there are significant price competition and pressure on margins in the 2011 environment, which discourage new investment. Pretoria Portland Cement’s (PPC’s) greenfield plant plans were scaled down to smaller brownfield investments. Consequently, unexpected growth in demand, coupled with early closure of uneconomic existing capacity, may result in a repeat of the 2007/08 shortages.

Electricity, transport and logistics costs and reliability

Energy and distribution costs are two of the largest components of cement costs. The impact of successive 25% increases in electricity prices in 2010 and 2011 and rising coal prices is expected to affect cement economics, since these constitute close to 20% of cement production cost.

It appears that unreliable service by Transnet Freight Rail division is still a constraint to the cement manufacturing industry. In addition, the industry indicates that the costs of Transnet’s rail investments are being passed on to customers such that freight cost increases are 4% to 5% higher than road freight cost increases. In the medium term, this is likely to disadvantage rail freight even further.

On outbound logistics, road transport is the main form utilised. Industry issues here relate to fuel cost increases. The cement industry is also concerned about the deteriorating condition of roads and the increasing direct toll costs of using roads, which add to cement prices. In particular, there is concern about the Department of Transport’s proposal for a dedicated heavy vehicle user fee for road freight, which arose through the Road Freight Strategy.

Environmental legislation and management and ageing plant

South African cement equipment and kilns are old, with an average age of 40 years. Despite this, established industry is of the view that the plants are well maintained and still produce good quality cement. However, they are not as energy-efficient as modern plants. For example, PPC’s R700 million upgrading of its Ntshafatso (Hercules) mill with a modern vertical roller mill will halve energy consumption from 65 kWh/ton to 31 kWh/ton of cement produced.

Looming environmental legislation (effective from 2015) will require significant capital investment. Already, listed producer PPC is spending most of its capital budget on replacing ageing plant and more than 10% of its total annual capital expenditure on projects to achieve environmental compliance.

The backlog in the approval of environmental impact assessments cited in the previous IIMP report seems to have been addressed. However, applications for environmental impact assessments and other permit requirements (such as waste, air and water licences) from different authorities require applicant firms to allocate significant resources.

Delays in decision-making are also a cause for concern; the delay in the Waste Tyre Regulation Act was cited as an example. Waste tyres can be used as an alternate fuel in cement kilns. Currently, the country produces about 240 000 tons of scrap tyres annually, which could replace kiln coal as fuel without any negative environmental consequences. The benefits would include decreased use of landfill space, less illegal burning of tyres and associated negative impacts on
ambient air quality, and a reduction in the use of non-renewable resources such as coal, leading to lower greenhouse gas emissions.

**Delays in government tender awards**

In June 2011, the Department of Public Works announced a moratorium on the issuing of new tenders, pending the completion of internal processes aimed at closing regulatory loopholes and improving the efficiency of the procurement system. While this will have some adverse impact on construction activity, the direct impact is unlikely to be significant, given that the national Department is responsible for only a portion of the government’s overall expenditure on buildings.

**Availability of key skills**

Cement industry constraints, as in many other sectors, include the availability of important skills. Of particular concern for this industry is the unwillingness of skilled workers, supervisors and managers to be located at facilities that are far from major towns or metropolitan areas.

**Import competition and dumping**

From time to time, the industry is adversely affected by the dumping practices of international competitors, some of which enjoy export incentives not offered to South African cement producers.

### 6.5 Bricks

The following section outlines the main issues affecting the supply of bricks.

**Energy costs**

Electricity is used in the brick production process to crush and extrude the clay brick. Some coal is mixed into the extrusion. Finally, the bricks are baked using either gas (10% to 12% of brickmakers), heavy fuel oil (20% of brickmakers), or coal (about 70% of brickmakers).

The Clay Brick Association (CBA) estimates that total energy costs are about 30% to 35% of brick production costs. The proportion has been rising, as coal prices have been approaching import parity prices and electricity prices have also recently risen steeply.

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11 www.engineeringnews.co.za/article/concrete-industry-relies-on-government-spending-2010-05-14
13 www.businessday.co.za/Articles/Content.aspx?id=124271
Transport costs

Increases in the cost of outbound road freight, mainly from fuel prices, are likely to have an impact on the competitiveness of clay bricks.

Mineral rights and other regulations governing mining

Clay mining is subject to the regulations associated with the Minerals and Petroleum Resources Development Act (2004) and the Mining Charter. CBA members have encountered delays in receiving new-order mining rights. In addition, mining licences have been issued for one year only.

Many smaller members of the CBA are of the view that the Act is more appropriate to large-scale mining than for smaller clay mining companies, mainly because they do not regard sending in a few graders to build a mud pile for brickmaking as constituting real mining.

Environmental impact assessment processes

Many CBA members experience frustration in obtaining environmental impact assessments, with a number of firms threatening to go to court.

Energy-efficient brickmaking technologies

Vertical shaft brick kiln technology is being introduced into South Africa. It lowers energy requirements and reduces emissions. Corobrick has converted a kiln in Lawley and has been able to finance the conversion project largely through the Clean Development Mechanism. The project is estimated to have cost around R20 million, employing 80 to 200 people. However, the conversion took three years. The CMA argues that only larger firms can currently emulate Corobrick because they can manage without production during a three-year conversion and weather the cash flow impact of receiving the R18.5 million carbon credit well after construction. The CMA is currently engaging with the Industrial Development Corporation with a view to making a facility available to smaller brick manufacturers for kiln conversion.

Alternative steel structures

The CMA also expressed concern that the housing policy may be gravitating towards home building technologies using, for example, light steel frames. The latter are much less labour-intensive than traditional construction methods using clay bricks.

6.6 Timber

Decline in afforestation

South Africa’s plantations have witnessed a net deforestation since the 1997 peak of 1.5 million ha under forest. By 2009, this had fallen to 1.25 million ha, an overall 18% decrease.

There are several reasons contributing to the steady decline in afforested areas since 1998. These include the following:
- The process of privatising Safcol’s assets, which contributed to a reduction in afforestation programmes;
- Removals (illegal deforestation and riparian removals);
- Destruction of forests resulting from increased pests and disease;
Forestry South Africa also argues that the uncertainty created by the debate around the government’s new land reform policy (as set out in the Green Paper) is contributing to the lack of investment in forestry. Issues that require certainty include:

- Nationalisation of land;
- Equity conditions;
- Land ownership ceilings; and
- Foreign ownership conditions.

**Pricing of inputs – administered prices**

Forestry South Africa cites the adverse impact of rising input costs on the forestry sector, including rail tariffs, water, electricity and property rates.

Producers of forestry products have formally raised their concern with Transnet Freight Rail through Forestry South Africa about the cost and reliability of rail transport. Between 2005 and 2010, some 40% of forestry freight shifted from rail to road. Part of the reason was the closure of a number of branch lines.

**Labour legislation – minimum wages**

Labour legislation relating to minimum wages has been a complex and controversial area for the forestry sector. It is also an integral part of the implementation of the Forest Sector Transformation Charter, which has affected the ability of the industry to respond to the demand for infrastructure inputs.

**Land restitution/claims and land reform policy**

In 2010, Safcol reported that 61% of its total landholdings were subject to land claims. These involved 28 separate claims, of which two had been settled. The main impediment to settlement was disputes between different communities over respective boundaries.

Until the debate around the Green Paper on Land Reform has run its course, there is likely to be an adverse impact on forestry investment, particularly afforestation.

### Success of the Department of Trade and Industry’s Industrial Policy Action Plan for Forestry and Timber (March 2008)

In 2005, an in-depth study analysed the value chain of forestry products and developed a number of recommendations. These were drawn into an Industrial Policy Action Plan in 2008, which aimed to:

- Increase raw material supply;
- Increase downstream beneficiation activities;
- Increase the participation of small, medium and microenterprises and broad-based black economic empowerment entities, including in higher value-added activities; and
- Improve competitiveness.

### Privatisation of Safcol

Following Cabinet’s decision in 1998 to privatise the state’s holdings in commercial forestry, a number of entities were consolidated and sold, together with a 70-year lease on the associated state forest land. Following a review, Komatiland Forests was regarded as too small to have any strategic impact on the economy and could therefore be sold. However, most of Komatiland’s land is owned by the (former) Department of Water Affairs and Forestry, and Safcol plants and harvests trees in terms of a delegation from the Minister of Water and Forestry. Converting this delegation into a 70-year lease is the subject of discussion, as the Land Claims Commissioner is not in agreement.

6.7 **Glass**

The following section outlines the main issues affecting the supply of glass.

### Energy costs

Glass manufacture is energy-intensive. PG Glass, the main domestic manufacturer of glass for the construction industry, uses Sasol gas for its furnaces and will, therefore, not be adversely affected by Eskom’s approved price increases of more than 25% over the next few years.

### Import competition

Imports are more or less balanced by exports for both float glass and safety glass, suggesting that any

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16 Safcol (South African Forestry Company Limited), 2010. Presentation to Parliamentary Portfolio Committee on Agriculture on the status of afforestation, 14 September.
specific shortages of product types can be met by imports. However, the quality of imports, particularly from Asia, is said to be lower than that of the domestic produce. Despite this, these imports have taken an increased share of the domestic market.

Glass pricing and competition issues
The increase in the PPI for all glass products more or less matches the increase in the PPI for all sectors. However, price increases for glass supplied to the building industry significantly exceeded the increase in the overall PPI.

6.8 Plastic pipes
The following section outlines the main issues affecting the supply of plastic pipes.

Input polymer pricing
Polymer inputs are estimated to constitute some 40% of plastic pipe making costs, with labour costs comprising some 36%.

Upstream polymer suppliers tend to practice import parity pricing, which impedes downstream plastic convertor industries, including plastic pipe manufacturers.

Plastic piping pricing and competition issues
In October 2007, DPI Plastics notified the Competition Commission of its intention to merge with Incledon Cape. The subsequent merger investigation revealed an industry-wide cartel that operated between 2004 and 2007, involving bid rigging, price fixing and market/customer allocation. It is not clear whether this case is linked to the PPI growth for plastic pipes being much lower than overall PPI growth.

6.9 Aggregates and sand
The following section outlines the main issues affecting the supply of sand and aggregates.

Regulation
According to the Aggregate and Sand Producers Association of Southern Africa, only about half of quarrying activity is reported to the Department of Mineral Resources, and there are actually more than 1000 quarries operating in the country.

Mining and Petroleum Resources Development Act
Some industry participants regard compliance with the Mining and Petroleum Resources Development Act as onerous, with implementation of the Act allegedly not being consistent. This is similar to the issue raised by cementitious product manufacturers, noted elsewhere in this report, and is part of the inherent tensions associated with health and safety regulation.

Electricity availability and cost
Electricity is mainly used in crushing and screening operations. The availability of electricity and its increasing cost are viewed as impediments to supply growth.

Aggregates and sand pricing and competition issues
Quarrying producer prices seem not to have risen as fast as the overall PPI since 2003. The reason for this is not clear, although it might reflect the balance of power between upstream and downstream sections of the industry.

6.10 Bitumen
The following section outlines the main issues affecting the supply of bitumen.

Supply availability
As predicted by previous IIMP reports, bitumen was in short supply during 2007/08. A shortage was also experienced in late 2010, particularly by the Gauteng Freeway Improvement Project, and again in the first quarter of 2011. Planned refinery shutdowns appear to have contributed to the shortage, which caused delays in the completion of road projects and significant national costs associated with prolonged traffic delays.

The 2010 situation led to a high-level intergovernmental interaction involving the oil refiners as well, with some affected road industry parties calling for bitumen to be declared a strategic material. This will cause it to be subject to some minimum stockholding level by the oil refiners.18

Predictability in demand forecasting
A number of issues have caused supply constraints, including provincial road project timelines being unreliable for suppliers’ planning purposes.

The South African Bitumen Association is developing a forecasting model that will be utilised to inform supply chain decisions.

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The South African Road Federation recently announced a six-point road rejuvenation strategy, which is based on:

- A re-examination of institutional structures for road provision;
- A planned approach of training and mentoring engineering graduates and the reintroduction of experienced professionals in road authorities;
- The reduction or elimination of political interference in the management of the road network;
- Improved planning and proactive maintenance programmes;
- More effective use of financial resources; and
- Improvements aimed at gaining the maximum utilisation from the available infrastructure.

The South African Road Federation has produced an excellent forecasting tool, which reviews the road network and provides a calculation method for estimating the impact on bitumen supply.19

Bitumen pricing and competition issues
Bitumen pricing is linked to fluctuations in the price of crude oil, while transport costs add about 22% to the refinery gate price of the product. Nevertheless, the growth in bitumen’s PPI is significantly higher than that of petrol, which is also derived from crude oil.

6.11 Capital equipment
The following section outlines the main issues affecting the supply of capital equipment.

Skills inputs
Artisan and engineering skills are likely to constrain an expansion in domestic output.

Material input costs
Import parity pricing of certain key input materials impedes competitiveness.

Capital equipment pricing and competition issues
The PPI for civil engineering plant has increased more or less in line with the PPI for all sectors. In contrast, the PPI for mining machinery has not risen as fast. The lowest increases have been in the category ‘other transport equipment’.

7 Emerging policy issues
As is evident, several factors in each value chain affect the capacity of each respective sector to respond to future demand arising from accelerated infrastructure expenditure.

Drawing on the detailed analysis across the range of infrastructure demand types and supply inputs, a number of policy issues emerged, which are discussed below.

7.1 IIMP data: Can it contribute to greater confidence by suppliers of infrastructure inputs?
A frequent question from industry associations and private firms, often cited in their quarterly reporting, is when the planned public sector infrastructure expenditure will happen.

The IIMP analysis suggests that such questions are too general. Different factors prevail in different infrastructure areas, for example in water and sanitation versus electricity generation.

Some common problems impede infrastructure expenditure, usually those associated with the capacity to procure infrastructure at municipal level and, to a slightly lesser extent, at provincial level. Addressing these problems directly is more likely to instil greater confidence among suppliers of inputs than the IIMP data by itself. However, better IIMP projections of planned infrastructure spending, coupled with information on the geographical location of such investment, can contribute to better production and investment planning by input industries.

7.2 IIMP data: How relevant to influence industrial policy

The IIMP output appears to provide considerable information on the inputs required for planned expenditure on national public sector infrastructure over the next three-year MTEF period. The 2011 IIMP has not made projections of private sector infrastructure expenditure but this can be addressed in future IIMP updates.

On this basis, the IIMP database provides reliable information at an aggregated level, which can guide industrial development policy and planning. As is evident, the database is currently capable of mapping a significant portion of disaggregated infrastructure expenditure spatially. However, further work is required to ensure that data is sufficient reliable at a spatial level, particularly infrastructure expenditure at municipal level and private sector infrastructure investment (which, as indicated, is currently recorded and tracked at an aggregated three-digit SIC level). As the integrity of IIMP data improves, the IIMP could become a much more important resource for localisation planning and, by implication, for pricing, efficiency and job creation.

7.3 IIMP data: How relevant to public sector procurement policy

Public sector procurement is governed by a number of regulatory processes, including those specified in the Public and Municipal Finance Management Acts and their associated regulations, and by the Broad-based Black Economic Empowerment Act. A number of ongoing reforms around these systems are aimed at improving the efficiency of public procurement.

The policy objective of increasing local content is the subject of specific policy instruments, including the Preferential Procurement Policy Framework Act, the National Industrial Participation Programme and the Competitive Supplier Development Programme. In addition to these, the state-owned enterprises have also shaped their own procurement systems to conform to the regulations.

In recent times, the weighting given to broad-based black economic empowerment objectives has often disadvantaged local supply and labour-intensive solutions, resulting in the procurement of imported goods and capital-intensive solutions.

Recent amendments to the Preferential Procurement Policy Framework Act aim to address this by aggressively increasing the local content and value added in goods and services procured by public institutions.

In this context, the IIMP database provides a good, detailed overview of the types of infrastructure inputs that might be required over the next MTEF period. This information can assist in steering procurement and supply towards outcomes that maximise local production and labour-intensive domestic supply.

7.4 The inability of spending agencies to spend allocated funds/public sector procurement efficiency

Government is committing considerable resources to unblocking the factors that impede capital expenditure.

The 2011 Budget review elaborates on the performance of these initiatives:

and document all the various initiatives currently underway or planned, which aim to improve procurement efficiency, and b) link these to particular infrastructure expenditure departments or infrastructure types.

### 7.5 The diversion of infrastructure funds and grants to other activities

The problem of a diversion of infrastructure funds has occurred more at provincial and local government level, particularly where the grant funding is intended to supplement equitable share allocations. Such practices may result in the IIMP estimates of demand for inputs being too high.

There may be a need for a specific IIMP initiative to improve the accuracy of the data, particularly at municipal level.
8 Themes for ongoing research

Drawing on the detailed analysis underlying this project, several issues require further or ongoing research. A few of these potential research questions are outlined below.

8.1 IIMP database

The IIMP database consists of three core components. The first is (mainly public sector) detailed infrastructure demand requirements according to infrastructure type. For comparative purposes, these have been expressed in rand value terms. The second component of the database is the respective conversion template, which converts expenditure on buildings, houses, roads, water systems, energy, transport and other infrastructure into estimated requisite inputs, such as steel, bricks, cement and machinery. The third component is a spatial summary of all capital expenditure by national sector departments and local municipalities.

The database should be viewed as a basic framework, the details of which can be further developed in subsequent years. Specific areas that could be improved upon in future versions of the IIMP include the following:

- **Spatial location of infrastructure**
  The DBSA database provides the municipal location of each infrastructure expenditure component logged by a local authority and/or sector department. In some cases, particularly for those items under provincial and national control, such as roads that transcend geographical boundaries, the data is only available at a national level. Depending on the need, the model could be further developed into a more accurate instrument with spatial location capabilities.

- **Disaggregating expenditure on housing and stand servicing at local government spatial level**
  The complexity of funding streams for housing and the changing nature of human settlement implementation have been partially detailed in the section above. It suggests that a specific research subproject be commissioned with the objective of determining the disaggregated expenditure on housing and stand servicing at local government level. An important output will be to map the spatial distribution of housing construction. Such a project could also spatially map expenditure on other public buildings, hospitals, schools, clinics, and the like.

- **Multiplier impact of infrastructure expenditure**
  The DBSA developed a social accounting matrix to assess the impact of infrastructure expenditure on economic growth and development. It may be useful for the output of the IIMP process to be incorporated into the model, with a view to determining multiplier impacts and other matters relevant to policy.

- **Comparative study of South Africa’s infrastructure demand and supply model with international equivalents**
  As the IIMP model is developed, it may be possible to investigate international comparative models and use these to improve the database and the model.

- **IIMP data: Impact on employment creation, factor productivity and capital accumulation**
  Future IIMP subprojects could investigate options for maximising employment in individual infrastructure sectors. Components of the terms of reference might include the following:

  - **Link to international research on infrastructure investment multipliers and how infrastructure investment affects growth via the following:**
    1. Capital accumulation or increasing the country’s asset base; and
    2. Labour and total factor productivity gains (by lowering production costs and enhancing further investment).

  - **Focus also on the (higher) labour absorption capacity of the maintenance and rehabilitation phases of infrastructure investment.**
However, the Competition Commission has provided considerable evidence of price fixing, tender rigging and abuse of dominant market positions across a range of infrastructure input sectors in the past. Poor supply chain management and procurement capabilities contribute to higher supply prices. Consequently, there is a risk that input pricing might adversely affect future infrastructure plans. This may also be a useful area of further investigation.

8.3 IT infrastructure expenditure
Expenditure by the public and private sectors on IT hardware and software is considerable and is largely ignored as ‘infrastructure’. Much of this expenditure is treated as an operating rather than a capital expense, but its cumulative impact on demand is very significant.

A good example is the Department of Home Affairs’ ‘Who am I online’ project, which has a multi-billion rand MTEF budget, but such expenditure is not recorded as infrastructure.

There does not appear to be a commonly accepted definition of what constitutes IT infrastructure versus IT capital expenditure. Perhaps this arises from accounting standards relating to the way in which IT expenditure can be written off against taxable income over a relatively short period. This could form the basis of a future research theme.