Cape Chamber of Commerce and Industry

Draft IEP Report and the IRP Assumptions and the Base Case 2016 – Initial Comments

Stakeholder Consultation Workshop
Western Cape: Cape Town International Convention Centre, Cape Town – 13 December 2016
The Cape Chamber of Commerce & Industry (CCC&I)

- Established in 1804 (> 200 years old)
- The oldest member based organisation in Africa
- Remained contemporary & relevant - a wide range of services, including information, training, networking, trade facilitation and robust advocacy on behalf of our members.
- We are the voice of business in the Western Cape
- Network >2,500 member companies
- Industrial focus portfolio - specific focus - energy & electricity security, supply & price path. The lifeblood, survival, job creator & major cost item of business
- Seminars on energy mix & socio-economic impact – across all electricity generation technologies – CCC&I is energy technology agnostic, supports a lowest cost, security of supply energy mix
Agenda

- IEP and IRP update consultation process
- IRP Update objective(s)
- Credible base case
- Planning assumptions and input parameters
- Demand forecast
- Economic parameters
- Generation technology cost and performance characteristics
- IEP objectives
IEP and IRP update consultation process

- Process flawed – 1st IEP then IRP, GUMP etc.
- Short time & notice to provide initial comments & final written submission to a vital piece of energy policy
- 5 years elapsed to release IRP update: from 2011 (IRP 2013 not cabinet approved without any explanation) – less than 3 month period allowed for stakeholder consultation and submissions from November 2016 over annual business holiday season to February 2017.
- Stakeholder consultation process proposed to be changed and longer duration – at least to 31 March 2017
- Propose change process to update IRP
  - First step: Assumptions, latest and best information
  - Next step: Criteria for “credible” base case
  - Next step: Select credible business case
DoE should “update” the IRP update process and progress

<table>
<thead>
<tr>
<th>Activity</th>
<th>Status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumptions</td>
<td>Done</td>
<td>This is subject to comments from various stakeholders.</td>
</tr>
<tr>
<td>Base Case</td>
<td>Done</td>
<td>This is subject to change based on comments received on the assumptions.</td>
</tr>
<tr>
<td>Scenarios</td>
<td>In Progress</td>
<td>The results of the scenarios will also be impacted by changes to the assumptions. Number of scenarios may also change based on feedback from public consultations.</td>
</tr>
<tr>
<td>Policy Adjusted IRP</td>
<td>To follow after scenarios</td>
<td>This will follow once the scenarios and public consultation is completed</td>
</tr>
</tbody>
</table>

Table 1: IRP Update Progress

- Assumptions not “Done” - stakeholders in process of commenting
- Base case not “Done” when not changed based on comments/advice received prior to release and still in consultation
- Scenarios “In Progress” - to evaluate eventually against credible base case
IRP base case not credible - based on objectives outlined in IRP document

2. Developing a credible Base Case from the IRP 2010 by updating the underlying assumptions based on new information;

- Underlying assumptions **not** “based on new information” – artificial limits constrained renewables similar to IRP2010 prior to REI4P
- Economic assumptions **not** based on “new information” – economic/GDP growth rates not based on realistic actual and forecast

- Key objectives of IEP/IRP:
  - Ensure security of supply;
  - Minimise the cost of energy;
  - Minimise negative environmental impacts from the energy sector;

- Base case should be least cost, without any artificial constraints, free of any policy adjustments - to ensure secure supply
New and relevant information on renewable energy penetration rates – not constrained

- Agree with MACE indications on solar PV and wind penetration rates, minister and DoE provided no explanation why advice of MACE ignored
- **No credible studies** available or commissioned to support claim that SA grid is a constraint for renewable energy additions or what rates of penetration
- SA needs an **independent review** of transmission and distribution grids and plans
Latest available, verified information on renewable cost – RE lower values

- Concur with CSIR technology cost assumptions
- CSIR cost used for re-optimised IRP is available to DoE from REI4P expedited round 4 (round 4.5)
- Furthermore, recent international bidding rounds indicate equivalent to R0.35/kWh in Abu Dhabi at current exchange rate
Latest, best information on cost of energy technologies, specifically nuclear is contentious

Table 10: Technology learning Rates

<table>
<thead>
<tr>
<th>Technology</th>
<th>2015 (R/kW)</th>
<th>2050 (R/kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV (fixed tilt)</td>
<td>16860.6</td>
<td>13425.03408</td>
</tr>
<tr>
<td>PV (tracking)</td>
<td>17860.6</td>
<td>14221.26959</td>
</tr>
<tr>
<td>Wind</td>
<td>19208.1</td>
<td>17287.405</td>
</tr>
<tr>
<td>Nuclear</td>
<td>55260</td>
<td>53768.80047</td>
</tr>
</tbody>
</table>

Source: IRP Analysis

- Nuclear cost in IRP 2016 base case appears too low based on arbitrary blended cost between EPRI (supposedly Western biased) and Asia (supposedly China building high numbers of reactors – not comparable to SA)
- **Cost research undertaken by DoE not available yet** – refer Parliamentary Portfolio Committee on Energy (PCE)
- **Chairman of PCE insists on public availability of research documents from DoE**, but also on **open discussion of energy mix** – specifically nuclear before further decisions – including base case and assumptions of IRP
Consensus information on economic GDP growth rates driving expected demand

**Table 4 GDP % growth forecasts per scenario**

<table>
<thead>
<tr>
<th>Year</th>
<th>Low</th>
<th>Moderate</th>
<th>High (Less energy intensive)</th>
<th>High (Same sectors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1.57</td>
<td>1.57</td>
<td>1.57</td>
<td>1.57</td>
</tr>
<tr>
<td>2015</td>
<td>1.40</td>
<td>2.20</td>
<td>2.50</td>
<td>2.50</td>
</tr>
<tr>
<td>2016</td>
<td>1.40</td>
<td>2.30</td>
<td>3.50</td>
<td>3.50</td>
</tr>
<tr>
<td>2017</td>
<td>1.80</td>
<td>2.70</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>2018</td>
<td>2.00</td>
<td>2.90</td>
<td>4.20</td>
<td>4.20</td>
</tr>
<tr>
<td>2019</td>
<td>2.00</td>
<td>3.00</td>
<td>4.50</td>
<td>4.50</td>
</tr>
<tr>
<td>2020</td>
<td>2.00</td>
<td>3.20</td>
<td>4.50</td>
<td>4.50</td>
</tr>
</tbody>
</table>

**Figure 2: Energy Demand Forecast**

- **SA growth rates** need to be evaluated and assumptions based on best forward estimates – consensus is **not 3.5% to 4.5%**
- We contend that the expected demand in the base case is not credible and latest information
Latest analysis on supply and demand outlook – no urgent investment decision required

- Agree broadly with EIUG internal analysis based on demand growth assumption of 1% YoY up to 2019, and 2% YoY onwards
- Thus **no need for an urgent investment decision** for further base load capacity in the short-term
- New capacity should be planned **appropriate to the demand**
- **Flexibility and diversification** of energy mix is vital – to result in shorter, controlled build that responds to changes in technologies and socio economic conditions
The daily “baseload” challenge is not addressed in IRP update – it remains controversial

- **Baseload requirement** referred to in statements by DoE and Eskom, but no case study or new information presented
- Difference between early evening peak and middle of night low in winter is on average 7 to 12 GW
- Demands a **flexible energy mix**, more “traditional” baseload such as nuclear and coal will exacerbate problem – no or limited “de-rating” during low demand period
- Other options, such as renewable energy combined with gas, is a solution and requires similar effort, funding and focus to study as is the case with baseload nuclear
Economic parameters based on exchange rate is not credible

Table 2: Economic Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value used in model</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discount Rate</td>
<td>8.2%(^1)</td>
<td>Net discount rate before tax</td>
</tr>
<tr>
<td>Exchange Rate</td>
<td>R/$ 11.55</td>
<td>Based on January 2015 exchange rate</td>
</tr>
</tbody>
</table>

- Current range June – November 2016 (R/$)
- High 15.42
- Low 13.23
- **Average 14.11**
- Difference on average is 22%
Anticipated Integrated Demand Management relative to PV Small Scale Embedded Generation

- Small scale embedded generation specifically of rooftop PV in residential and industrial/commercial has a much larger impact than IDM
- New information based on smaller than 1MW installations should be taken into account
- During 2015 rooftop PV solar installations in South Africa increased by 330% to 83 MW and the industry expects this figure to reach 500 MW in 2016
- Furthermore, penetration of electric vehicles and energy storage in distributed battery systems has to be investigated for IRP and IEP
Conclusion and proposal on way forward

- Clarify IEP process and integration with IRP (and GUMP)
- Postpone IEP and IRP inputs on assumptions and criteria for IRP base case to 31 March 2017
- Then consult on Assumptions and input on credible base case
- Then publish credible, updated base case and scenarios

- Base case must be least cost, free of artificial constraints and free of policy adjustments

- Test all work and outputs against stated IEP/IRP objectives with criteria to measure including:
  - Ensure security of supply;
  - Minimise the cost of energy;
  - Minimise negative environmental impacts from the energy sector;
  - Diversify supply sources and primary sources of energy
IEP and IRP development process

- IEP drives/informs IRP
- IEP drives/informs GUMP (Gas Utilisation Master Plan)