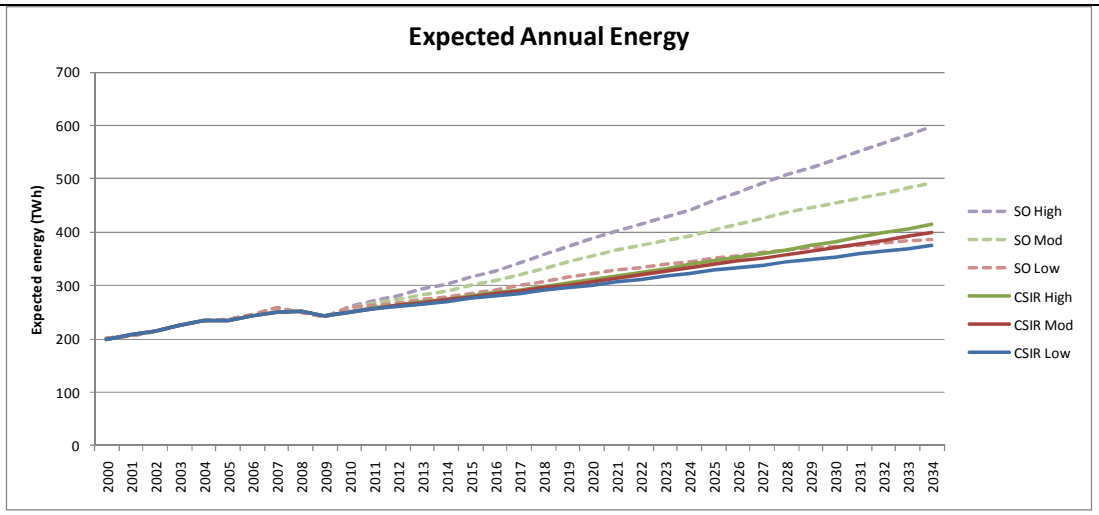
energy
Department:
Energy
REPUBLIC OF SOUTH AFRICA

D1: Demand (Energy & Maximum Demand) Forecast - IRP 2010 Input Parameter

Parameter	Annual Demand Forecast (Energy and Maximum Demand)
Parameter Value	EXPECTED ANNUAL RSA SENTOUT ENERGY (GWh)

	CSIR Low	CSIR Mod	CSIR High	SO Low	SO Mod	SO High
2010	249,051	249,422	249,626	257,601	259,685	261,769
2011	255,882	256,744	257,693	262,394	266,681	270,969
2012	261,031	262,376	263,682	267,784	274,403	281,022
2013	265,790	267,694	269,169	274,788	283,914	293,041
2014	270,630	272,964	274,497	278,880	290,540	302,201
2015	275,735	278,589	280,341	285,920	300,425	314,930
2016	281,051	284,450	286,545	292,728	310,243	327,758
2017	285,930	289,983	292,552	299,991	320,751	341,511
2018	290,870	295,628	298,548	308,036	332,381	356,725
2019	296,027	301,486	304,790	316,501	344,726	372,950
2020	301,255	307,503	311,226	323,498	355,694	387,891
2021	306,544	313,601	317,996	329,556	365,826	402,095
2022	311,934	319,869	324,928	334,587	375,033	415,480
2023	317,465	326,326	331,948	339,160	383,914	428,668
2024	323,104	332,998	339,306	343,634	392,880	442,126
2025	328,456	339,436	346,399	350,065	404,358	458,650
2026	333,733	345,864	353,525	355,785	415,281	474,777
2027	338,636	352,012	360,379	361,300	426,196	491,093
2028	343,651	358,365	367,618	366,319	436,761	507,204
2029	348,758	364,884	375,017	370,007	445,888	521,769
2030	353,979	371,616	382,774	372,947	454,357	535,766
2031	359,240	378,322	390,643	376,272	463,503	550,734
2032	364,479	385,185	398,831	379,737	473,046	566,356
2033	369,735	392,205	407,027	383,410	483,075	582,740
2034	375,107	399,384	415,456	386,404	492,540	598,677

IRP INPUT PARAMETERS



For the IRP model the highest of the forecasts will form the upper bound of the cone and the lowest the lower bound of the cone for sensitivity analysis. The IRP model will develop a scenario-wise decomposition from this cone to determine the optimal path that needs to be met by new generation capacity. The result of the scenario-wise decomposition will form the basis of the forecast for the IRP scenarios.

Rationale

The Annual Electricity Demand forecast is an outcome of the modelling process for electricity demand, based on the assumptions listed below:

- Economic growth, reflected in the Gross Domestic Product input parameter (D2)
- Energy intensity changes, reflected in the Electricity intensity input parameter (D3,4)
- Universal Access policy assumptions,
- Customer specific input (historic actual consumption and future trends),
- International sales,
- Historic demand side management and results,
- System losses,
- Temperature, and
- Load profiles for customer sectors.

The methodology behind the forecast (and use of these inputs) is described in the report from the System Operator (SO_IRP 2010 Energy Forecast Final Report.pdf). Additional information is provided in the CSIR forecast report (CSIR_Model_IRPForecasts2010_Final_v2.pdf)) indicating an alternate methodology and result.

IRP INPUT PARAMETERS

Responses to Public Inputs

Summary of specific comments	Response
Inconsistencies in the data provided between D1,D2, D3 and D4. (90X2030, CJN!-WC)	The different parameter sheets were initially drawn from different sources and indicated examples of future growth. These should now be consistent.
CSIR forecast to be made public (90X2030, Coega Development Corporation)	Indeed and indicated above, along with the report.
Concern that price elasticity of electricity demand not explicitly indicated (Energy Caucus)	As discussed in D5, price elasticity is included implicitly, rather than explicitly due to the dearth of reliable analysis on this particular input.
Indicated forecast outdated (90X2030, CIC, ELA)	Indeed, and revised.
Anticipated growth modest (electricity demand growth double that of GDP since 1960s) (NIASA)	D3,4 discusses this relationship and why it is felt this has changed, and will continue to change, over time.
The energy conservation potential is not fully considered in the demand forecast (90X2030)	Demand side interventions, including energy conservation or efficiency, are included as options to compete with supply side options. Programmes are identified for consideration in D6,7,8
Integration with other energy carriers/providers not clear – forecast should not be looking at electricity in isolation (CEF)	Noted. The integration with national energy planning is being investigated.
Sector demand profiles not indicated (90X2030, CJN!-WC, ELA). Need to align these forecasts with industrial policy (ELA)	This is indicated more clearly in the adjoining reports from the System Operator and the CSIR. Alignment with industrial policy is still under consideration.
Losses calculations are based on Eskom Tx and Dx losses – municipal losses tend to be higher (CIC)	Municipal losses are included in the forecast – from the System Operator perspective it is included in the customer sales data (as sales from Eskom to the municipalities), from the CSIR perspective all losses are included at a national average.
Distributed generation will impact on Tx and Dx losses and should be incorporated in the plans (SAWEA, SusActMov, Windlab Developments SA)	Noted. The impact of distributed generation could be modelled from the perspective of a reduction in costs (relative to centralised generation).
Demand forecast should err on the conservative side (least regret) (CIC)	The cone provides a mechanism to deal with the uncertainty of the forecast. Sensitivity studies will indicate the least regret options within this cone.
Non-technical losses and non payments of accounts should be taken into account in the demand forecast (Exxaro), along with plans to reduce these	The non-technical losses are included in the assumption. The issue is both a revenue consideration for Eskom and licensed distributors, but also a energy demand issue. Future demand forecasts could include mechanisms to reduce the energy losses associated with this.
Demand projections should be related to tariff types (CJN!-WC)	This is a possibility that deserves further investigation.
Causality of electricity demand and GDP growth (Enerco); electricity supply leading economic growth (due to capacity constraints)	For the purposes of the development of the forecast it is not necessary to establish causality, it is sufficient to argue a coincidence between electricity demand and economic growth. Supply constraints are important, but the method adopted for IRP was to assess demand without constraints in order to indicate where these constraints exist, and potential remedies.
Geographic split of demand projections (CJN!-WC)	Noted. This is a consideration for future iterations of the IRP.
Non-utility generation needs to be accounted for, both in supply side and consumption values (SASOL)	Noted. This is being done in the current forecast and supply options.
Allow for sensitivities / uncertainty regarding the forecast (SAWEA, SusActMov, Windlab Developments SA)	Noted. The forecast above allows for a cone of uncertainty around the moderate forecast.
Allow for IRP adjustments at regular intervals (Windlab Developments SA)	Noted. It is expected that the IRP should be revisited at regular intervals, every two years if not annually.