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How Political Commitment Drives the STE/CSP Deployment Worldwide

ESTELA Workshop 12 January 2017

Presentation Outline

1. IRP 2010 – Background & STE/CSP Approved MW Allocation
2. Draft IRP 2013 – Background & STE/CSP Proposed CSP Allocation
3. Draft IRP 2016 – Background & Zero STE/CSP Allocation
4. Efforts being done to get STE/CSP into the Draft IRP 2016
5. Conclusion

1: IRP 2010 – STE/CSP Approved MW Allocation

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Table 1 – IRP2010 Policy Adjusted Plan with Ministerial Determinations

	New build options								Committed					Non IRP
	Coal (PF, FBC, imports, own build)	Nuclear	Import hydro	Gas – CCGT	Peak – OCGT[1]	Wind	CSP	Solar PV	Coal	Other	DoE Peaker	Wind[2]	Other Renew.	Co-generation
	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW
2010	0	0	0	0	0	0	0	0	380	260	0	0	0	0
2011	0	0	0	0	0	0	0	0	679	130	0	0	0	0
2012	0	0	0	0	0	0	0	300	303	0	0	400	100	0
2013	0	0	0	0	0	0	0	300	823	333	1020	400	25	0
2014	500	0	0	0	0	400	0	300	722	999	0	0	100	0
2015	500	0	0	0	0	400	0	300	1444	0	0	0	100	200
2016	0	0	0	0	0	400	100	300	722	0	0	0	0	200
2017	0	0	0	0	0	400	100	300	2168	0	0	0	0	200
2018	0	0	0	0	0	400	100	300	723	0	0	0	0	200
2019	250	0	0	237	0	400	100	300	1446	0	0	0	0	0
2020	250	0	0	237	0	400	100	300	723	0	0	0	0	0
2021	250	0	0	237	0	400	100	300	0	0	0	0	0	0
2022	250	0	1 143	0	805	400	100	300	0	0	0	0	0	0
2023	250	1 600	1 183	0	805	400	100	300	0	0	0	0	0	0
2024	250	1 600	283	0	0	800	100	300	0	0	0	0	0	0
2025	250	1 600	0	0	805	1 600	100	1 000	0	0	0	0	0	0
2026	1 000	1 600	0	0	0	400	0	500	0	0	0	0	0	0
2027	250	0	0	0	0	1 600	0	500	0	0	0	0	0	0
2028	1 000	1 600	0	474	690	0	0	500	0	0	0	0	0	0
2029	250	1 600	0	237	805	0	0	1 000	0	0	0	0	0	0
2030	1 000	0	0	948	0	0	0	1 000	0	0	0	0	0	0
Total	6 250	9 600	2 609	2 370	3 910	8 400	1 000	8 400	10133	1722	1020	800	325	800

2011 Determinations 2012 Determinations Eskom commitments (pre IRP)

Notes: 1. OCGT is seen as natural gas in the determination
2. Includes Sere (100MW)

2: Draft IRP 2013 Update – STE/CSP Allocation

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Table 2 – Technology options arising from IRP 2010 and the Update Base Case in 2030

Technology option	IRP 2010 (MW)	Base Case (MW)
Existing Coal	34746	36230
New Coal	6250	2450
CCGT	2370	3550
OCGT / Gas Engines	7330	7680
Hydro Imports	4109	3000
Hydro Domestic	700	690
PS (incl Imports)	2912	2900
Nuclear	11400	6660
PV	8400	9770
CSP	1200	3300
Wind[3]	9200	4360
Other	915	640
TOTAL	**89532**	**81350**

Notes:

(1) Demand Response options added to IRP 2010 to ensure comparability (previously not considered in IRP)

(2) "Existing" coal includes Medupi and Kusile

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Base Case Results

	New Build Options												
	PV	Wind	LandfillGas	DR	Nuclear	OCGT	CCGT	Coal PF w FGD	Inga	CO2 Emissions	Peak Demand (MW)	Firm Reserve Margins (%)	Water Consumption (Mil tonne)
2020										253	44916	24	276873
2021	160									264	46130	28	265765
2022	160									268	47336	23	262350
2023	370	200								272	48547	20	263338
2024	440	500		1000		396				279	49656	18	271908
2025	650	1000	15	1000		2376	732			278	51015	19	275381
2026	580	1000	5	1000		264	1464			278	52307	19	273259
2027	580	1000	230	1000		264	2196			276	53561	19	262760
2028	580	1000		500		396	1464	1500		277	54567	20	254974
2029	580	1100		1000			1464	1500		273	56009	18	226864
2030	580	1200		1000		1716		2250	1000	274	57274	20	205791
2031	580	1200		1000		1584		750		274	58630	20	194160
2032	580	1000		500			732	1500	1000	278	59878	22	181019
2033	580	1200					1464	750	500	276	61388	23	168137
2034	580	1600		1000		1452				278	62799	22	157553
2035	580	1600		500			1464	1500		278	64169	23	136792
2036	580	1600		1000				1500		278	65419	21	123168
2037	580	1400		500	1359		732	2250		277	66993	22	109116
2038	580	1600				1848	1464	750		273	68375	22	102955
2039	650	1500			1359		2928			267	69584	22	93196
2040	650	1600		1000		1056	732			261	70777	20	77738
2041	650	1600		1000	4077	792		750		236	72343	21	73977
2042	650	1600		500			2196			233	73800	21	72668
2043	650	1600		500						232	75245	21	71510
2044	650	1800		500	1359					228	76565	21	71046
2045	770	1600			2718		2196			230	78263	23	71722
2046	790	1600		500	1359	924				225	79716	20	68669
2047	720	1800		1000	1359		732			219	81177	19	65479
2048	720	1600		500	2718	264				211	82509	20	62275
2049	660	1500		500	1359					206	84213	20	58180
2050	720	1400		500	2718					196	85804	20	53605
Total (MW)	17600	37400	250	500	20385	13332	21960	15000	2500				

energy
Department:
Energy
REPUBLIC OF SOUTH AFRICA

Learning Rates	PV and Wind	Fuel Prices	Emissions
Moderate	Annual build Constraints	IRP 2015 Fuel Price	Advance Decline
No Learning	No Annual build Constraints	New Policy Prices	Moderate Decline

- Ave LF
  - Coal=85%
  - Nuclear=92%
  - CCGT=27%

4: Efforts to get CSP in the Draft IRP 2016

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1. There is currently a public consultation process to be concluded by 31March 2017

2. The main reason why CSP does not appear in the Draft IRP 2016 is that the cost assumptions used for CSP do not reflect the current market realities and the future projected costs if the learning rates for CSP are taken into account.

3. The CSP Community is participating in the consultations with the aim of getting CSP in Draft IPP 2016

5: Conclusion

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1. It is clear that in the context of South Africa, political commitment for CSP via the IRP 2010 led to the deployment of CSP projects in South Africa. It is for this reason that there are 200MW of CSP plants in operation, 300 MW in Construction and 450 MW waiting for preferred bidder award (Expedited Bid Window 4.5).

2. The CSP Pipeline of projects in development is over 5GW, this was triggered by the positive figures allocated to CSP in the Draft IRP 2013 that was not promulgated.

3. With a ZERO allocation in the Draft IRP 2016, the impact of this will kill the CSP industry in South Africa if CSP does not find its way back into the Draft IRP 2016