D6,7,8: Demand Side Management - IRP 2010 Input Parameter

Parameter	Demand Side Management, Energy efficiency, and DMP/DR (combined)
Parameter Value	The following demand side management (DSM) programmes will be treated as committed for the base case. Additional DSM will be added to the Enhanced DSM scenario to test the impact of additional programmes.

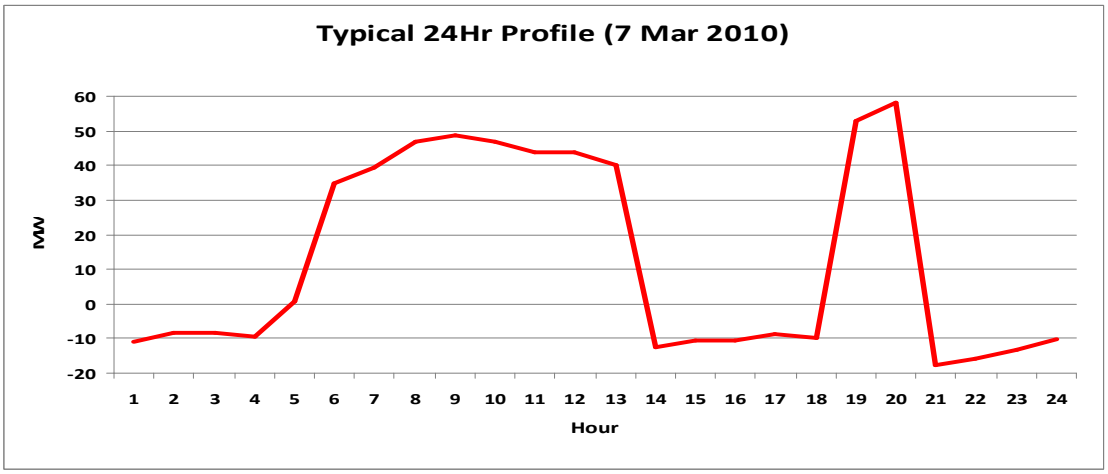
DSM programmes

		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Comp Air	Capacity (MW)	39	76	115	151	211	275	275	275	275	275	275
	Energy (GWh)	297	581	881	1158	1619	2110	2110	2110	2110	2110	2110
Heat Pumps	Capacity (MW)	3	35	110	282	463	522	581	640	640	640	640
	Energy (GWh)	14	142	445	1,137	1,866	2,104	2,341	2,579	2,579	2,579	2,579
Lighting HVAC	Capacity (MW)	106	137	169	199	233	271	271	271	271	271	271
	Energy (GWh)	673	874	1,074	1,266	1,482	1,724	1,724	1,724	1,724	1,724	1,724
New Initiatives	Capacity (MW)	-	-	-	17	38	68	68	68	68	68	68
	Energy (GWh)	-	-	-	123	275	492	492	492	492	492	492
Process Optimisation	Capacity (MW)	81	151	210	293	384	467	467	467	467	467	467
	Energy (GWh)	608	1,137	1,582	2,208	2,895	3,521	3,521	3,521	3,521	3,521	3,521
Shower Heads	Capacity (MW)	-	20	85	85	85	85	85	85	85	85	85
	Energy (GWh)	-	58	248	248	248	248	248	248	248	248	248
Solar Water Heating	Capacity (MW)	26	78	123	287	556	910	1,263	1,617	1,617	1,617	1,617
	Energy (GWh)	76	227	360	838	1,622	2,656	3,689	4,722	4,722	4,722	4,722
Total	**Capacity (MW)**	**254**	**496**	**811**	**1,313**	**1,969**	**2,597**	**3,009**	**3,422**	**3,422**	**3,422**	**3,422**
	Energy (GWh)	**1,669**	**3,020**	**4,590**	**6,978**	**10,007**	**12,855**	**14,126**	**15,397**	**15,397**	**15,397**	**15,397**

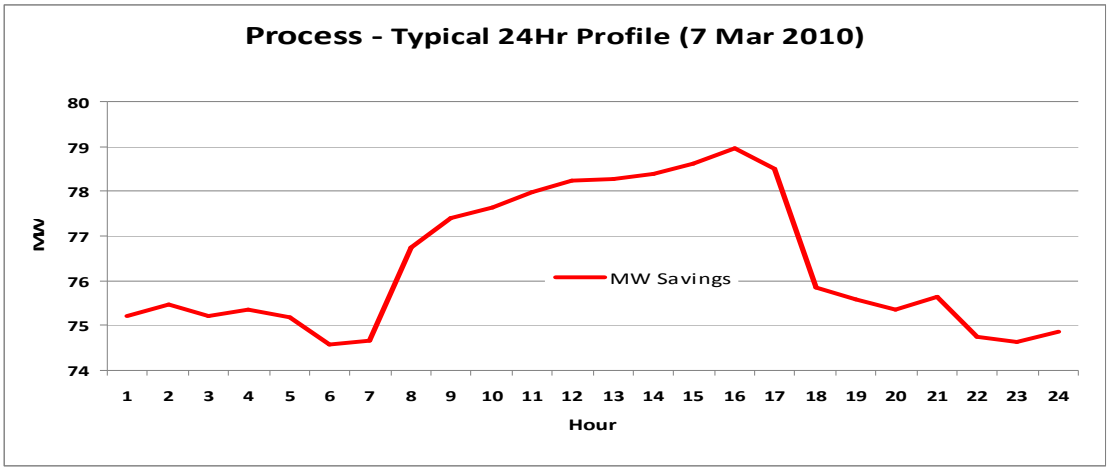
IRP INPUT PARAMETERS

TYPICAL DAY PROFILE FOR DSM PROGRAMMES

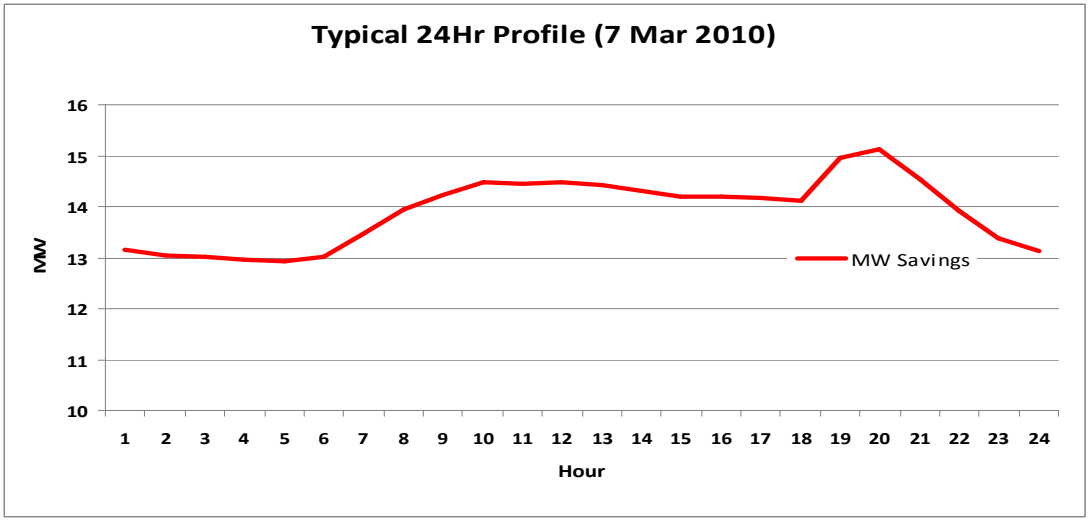
Solar Water heating



Process

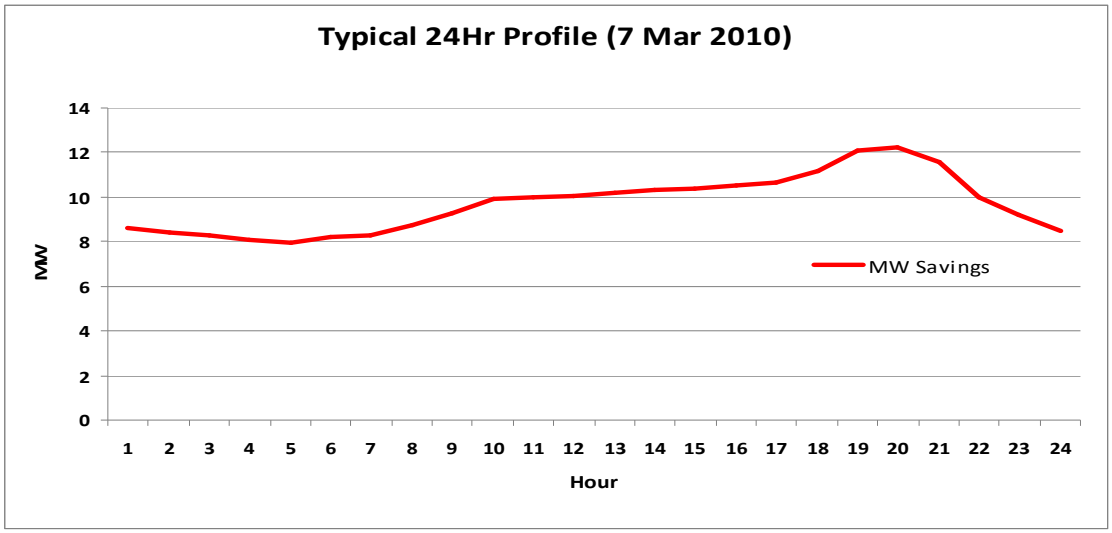


New Initiatives

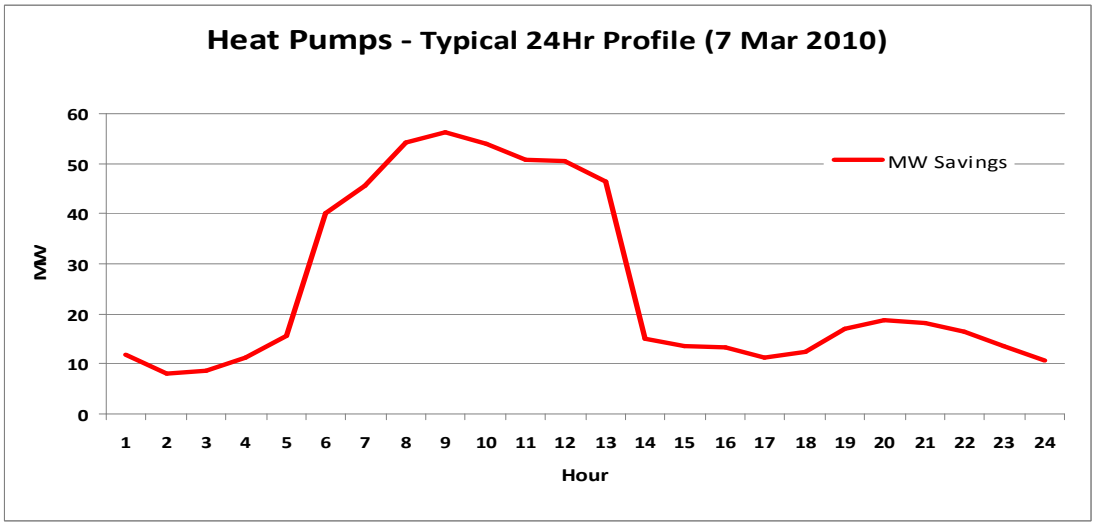


IRP INPUT PARAMETERS

Lighting and HVAC

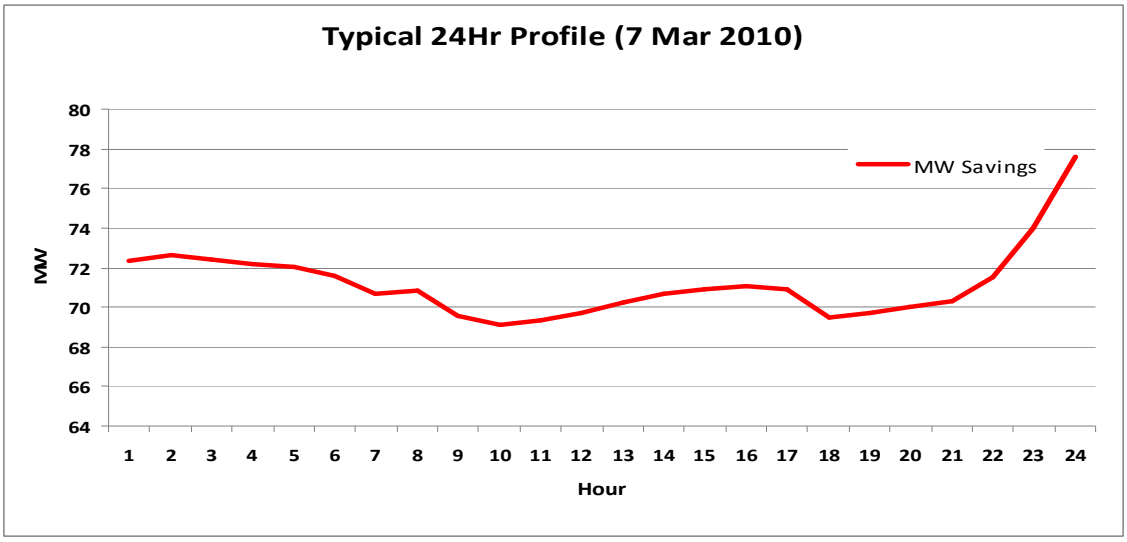


Heat Pumps



Compressed Air

IRP INPUT PARAMETERS



For Demand Response (DR), which includes additional Demand Market Participation (DMP), the profile is driven by System Operator requirements and therefore cannot be separately predicted.

Rationale

Historic results of previous demand-side management programmes are locked into the demand forecast. Future DSM initiatives are not included in the demand forecast, but are included in the IRP model as committed programmes.

Energy efficiency (as a separate concept to DSM) covers the usage of electricity by consumers. The effect of the price increases would impact on energy efficiency and is already catered for in the electricity intensity parameter sheet. DSM will include specific programmes (or interventions) which may target energy efficiency. These are included above.

While the public participation process provided good direction and ideas on future programmes, there remains little additional information to test these programmes. Thus for this iteration of the IRP we are forced to rely on the Eskom DSM programme.

Responses to Public Inputs

Summary of specific comments	Response
Energy efficiency should reduce demand by at least 25% by 2025 (90x2030, CJN!-WC)	Targets for energy efficiency will be included in the Enhanced Efficiency scenario (see O1)
Focus of DSM should be extended to commercial and industrial (90x2030, CJN!-WC)	Noted. The above programmes do include commercial and industrial applications.
Possible programmes (amongst others): Accelerated rollout of SWH, CFLs (90x2030, Windlab Developments SA) Replacement of inefficient household options (90x2030) Ceiling installation and insulation programme (90x2030) Heat pumps for room heating (90x2030) Heat pumps for water heating (NIASA) Geyser insulation (Private-BM) Ban on electric swimming pool heating, incl heat pumps (90x2030) Mandatory SWH for new residential and commercial buildings Smart metering (90x2030, CJN!-WC, Private-WB, Exxaro) Time of day and time of use tariffs for residential and commercial (90x2030, Private-WB) Mandatory energy management systems for commercial buildings (90x2030) Improved building standards for doors, windows, and wall and ceiling insulation Improved standards on electric applications, ban on low efficient appliances, mandated labels on appliances (90x2030) Waste heat co-generation (ACMP)	Noted. Further information on these programmes will be gathered and included in future iterations of the IRP.

	Energy storage technologies (CJN!-WC)	
	DSM initiatives do not seem to have sufficient realism in the expectations of timeframes, costs, savings extent (CIC, IES)	Noted. The above programmes are based on Eskom expectations in the absence of a broader consensus.
	Costs for DSM/EE need to be included and considered in the same way as generation costs (CJN!-WC, Coega Development Corporation, SAWEA)	Noted. However for the reasons indicated above, the Eskom programme is being treated as committed.
	Industry specific targets are more meaningful than a global target for energy savings. These can only be set once an energy audit has been completed. (ACMP)	Noted.
	Firm commitments to be included in the IRP, ref. 2005 DME Energy Efficiency Strategy. (Energy Caucus), The Energy Efficiency Accord has a target of 15% by 2015 (SASOL)	The scenario for Enhanced Efficiency will cover specific targets and commitments.
	Total costs should be included (for all aspects regarding contractual arrangements) (Exxaro)	Noted.
	Storage (thermal and pumped hydro) should be added to load shifting and energy efficiency initiatives, especially utility scale storage (Mbani WeSizwe)	Noted. This possibility will be considered for future iterations.
	EE targets need to be updated, considering recent changes in energy efficiency in the SA economy (CIC)	Noted. The target will be included in the Enhanced Efficiency scenario.
	Energy efficiency should be included at the production stage of the supply chain. Increased efficiency in the existing generation fleet could provide an additional 2300MWe(Alstom)	Noted. Eskom has already made improvements at some of its power stations.
	Most programmes should include a mandatory element, enforced through a nationwide office (Private-BM)	Noted.
	Merge DSM with DMP/DR (SAWEA)	Noted.
	DSM should not be run by Eskom (Windlab Developments SA)	Noted. The IRP should not differentiate between energy producers or service providers. Eskom data was used for the IRP due to the lack of tangible alternatives.
	Eskom is optimistic on the availability of DMP/DR as a tool, whereas the current contracts make uptake unattractive (ACMP). Payment to participants in DMP may be inadequate (Exxaro)	Noted. In the absence of better information we need to remain with Eskom's funded plan.
	The indicative potential of 3000MW DR is not justified, nor are costs provided. (CIC, 90x2030, CJN!-WC)	Noted. The DR programme included above highlights a more conservative potential and provides assumed cost information.
	The contracted of DR should vest with the ISMO and not Eskom (CIC, Private-WB)	Noted. The IRP should not differentiate between energy producers or service providers, but the efficacy of the programme may be impacted by the counter-party. This is a policy issue that may be informed by the IRP.
	The role of energy storage systems in DMP/DR need to be considered (90x2030, CJN!-WC, Mbani Wesizwe)	Noted. Pumped storage and CSP with storage are already being considered.
	DMP/DR involves perverse incentives regarding the selling back of excess supply to the SO. DoE needs to address this potential. (ELA)	Noted.
	IRP should commit to the DR strategy, quantifying the cost-benefit and generation capacity avoided. (Energy Caucus)	The enhanced DSM scenario should provide an assessment of the cost-effectiveness of additional programmes, with the potential to avoid generation capacity.
	DR should only be an Eskom emergency tool in the short term and not used in the IRP as an option (SASOL)	Noted. In the IRP this should however compete with other peaking or emergency options.
	Potential for demand reduction seems to be under-estimated with no visible consideration of generation efficiency improvement (90x2030, CJN!-WC)	Noted.
	The energy conservation figures, including the potential, are not substantiated. It is not clear how these are modelled in the demand projections and IRP. (90x2030)	Energy conservation is not included in the IRP as this is an emergency short-term option. (See D9)
	Focus should be on beneficiation. (Coega Development Corporation)	Beneficiation forms one part of the total production capacity of the economy, albeit an important one given recent industrial policy. EE in beneficiation requires additional consideration.
	Citations for the 8% EE savings are required. The forecasted evolution of savings over time also important. (DoE)	A target will be included in the Enhanced Efficiency scenario, which will describe an assumption rather than a forecast.
	There seems to be a lack of regulatory or legal processes (including a tariff price) to support EE. The measures seem to	The IRP should provide guidance to future policy on EE, especially if the Enhanced Efficiency scenario provides a

	be technological rather than conservation based and fall fowl of Jevons Paradox. (ELA)	case for further interventions.	
	It is not necessarily true that energy efficiency leads to increased energy consumption. International strategies for reducing carbon emissions all give energy efficiency as a key strategy – which wouldn't work if it led to increased energy consumption. (Energy Caucus, Private - WB) The forecast energy-efficiency improvement of <8% from 2000 to 2015 is 0,5% a year. Globally, energy efficiency grew by twice this at 1% a year between 1980 and 2003 and McKinsey & Co believe this could be boosted to 2.5% p.a. to 2020. (Energy Caucus)	Noted.	
	PCP penalties are unwieldy and could severely impact the economy (Exxaro)	Noted. Energy conservation is not being included in the IRP. (See D9)	
	Tax incentives for energy efficiency still not implemented (Exxaro)	The IRP should provide guidance to future policy on EE, especially if the Enhanced Efficiency scenario provides a case for further interventions.	
	Ensure no double accounting between DSM, Energy conservation and electricity intensity in the modelling process. (SASOL)	Electricity intensity highlights the relationship between economic production and electricity demand and will include some "natural" or consumer driven energy efficiency (impacted by pricing amongst other things). The DSM programme will include demand side interventions by authorities (with a central funding methodology). All central authority energy efficiency initiatives will be included under DSM. Energy conservation relating to the PCP programme is not included in the IRP (See D9).	
	Co-generation and self-generation should be part of supply-side options and not demand-side. (SASOL)	Noted. Where possible self-generation is specifically identified in IRP supply-side capacity.	
	The Eskom DSM project is only one part of the total SA EE potential. (SASOL)	Noted. Where consumers are not implementing own EE due to price, central authority DSM initiatives are likely to play a role. The Eskom data has been used in the absence of other inputs, but this does not necessary mean Eskom will be the only implementation vehicle.	
	Assumption that energy efficiency will not improve by more than 8% by 2015 is not sufficient – the IRP should be able to provide additional EE as an option (SAWEA)	Noted. EE programmes are included as options, but additional targets are included in the Enhanced Efficiency scenario.	