LCA Errata Sheet

1. Figure 9-2 *Present Value of Total Capital Expenditures through 35 and 78 Years- Millions of 2014 Present Value Dollars*

- Slight modification to column "Present Value of Total Capital over 78 years

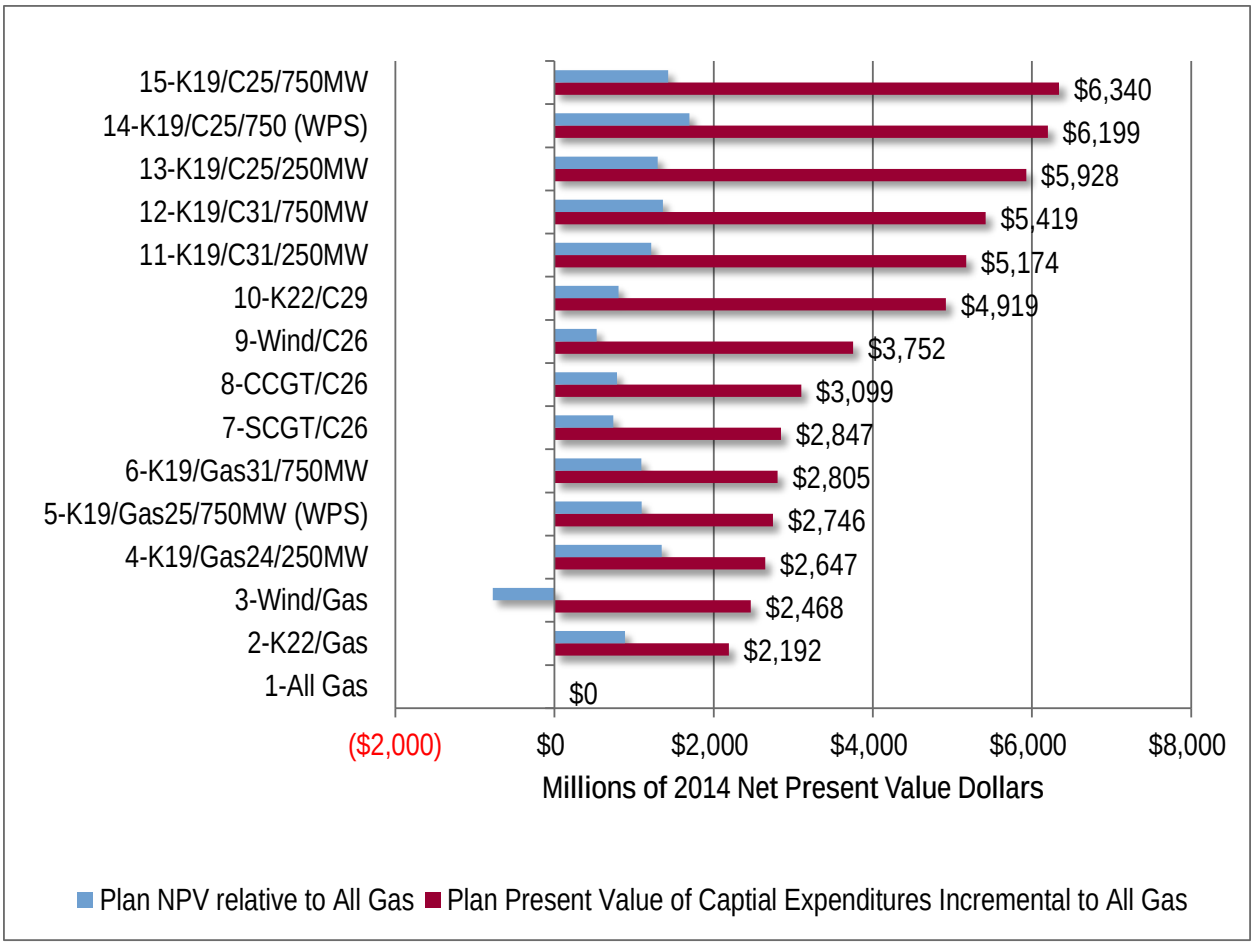
Plans	Present Value of Total Capital over 35 Years	Present Value of Total Capital over 78 Years
1-All Gas	$1,363	$1,662
2-K22/Gas	$3,630	$3,854
3-Wind/Gas	$3,245	$4,130
4-K19/Gas24/250MW	$4,054	$4,309
5-K19/Gas25/750MW (WPS)	$4,164	$4,408
6-K19/Gas31/750MW	$4,250	$4,467
7-SCGT/C26	$4,407	$4,509
8-CCGT/C26	$4,604	$4,762
9-Wind/C26	$5,211	$5,414
10-K22/C29	$6,501	$6,582
11-K19/C31/250MW	$6,711	$6,837
12-K19/C31/750MW	$6,974	$7,081
13-K19/C25/250MW	$7,496	$7,591
14-K19/C25/750 (WPS)	$7,748	$7,861
15-K19/C25/750MW	$7,889	$8,002

2. Page 9A-60 - 9A-61 states ""… is the scenario of Low Energy Prices, Low Discount Rates, and Lows(sic) capital costs. The value of the cell or low energy prices, low discount rates and low capital costs is -$2,155 or approximately $2.2 billion of an NPV penalty."

- -$2,155 should be -$292 million corresponding to the value for Low Energy Prices, Low Discount Rates and High Capital Costs.

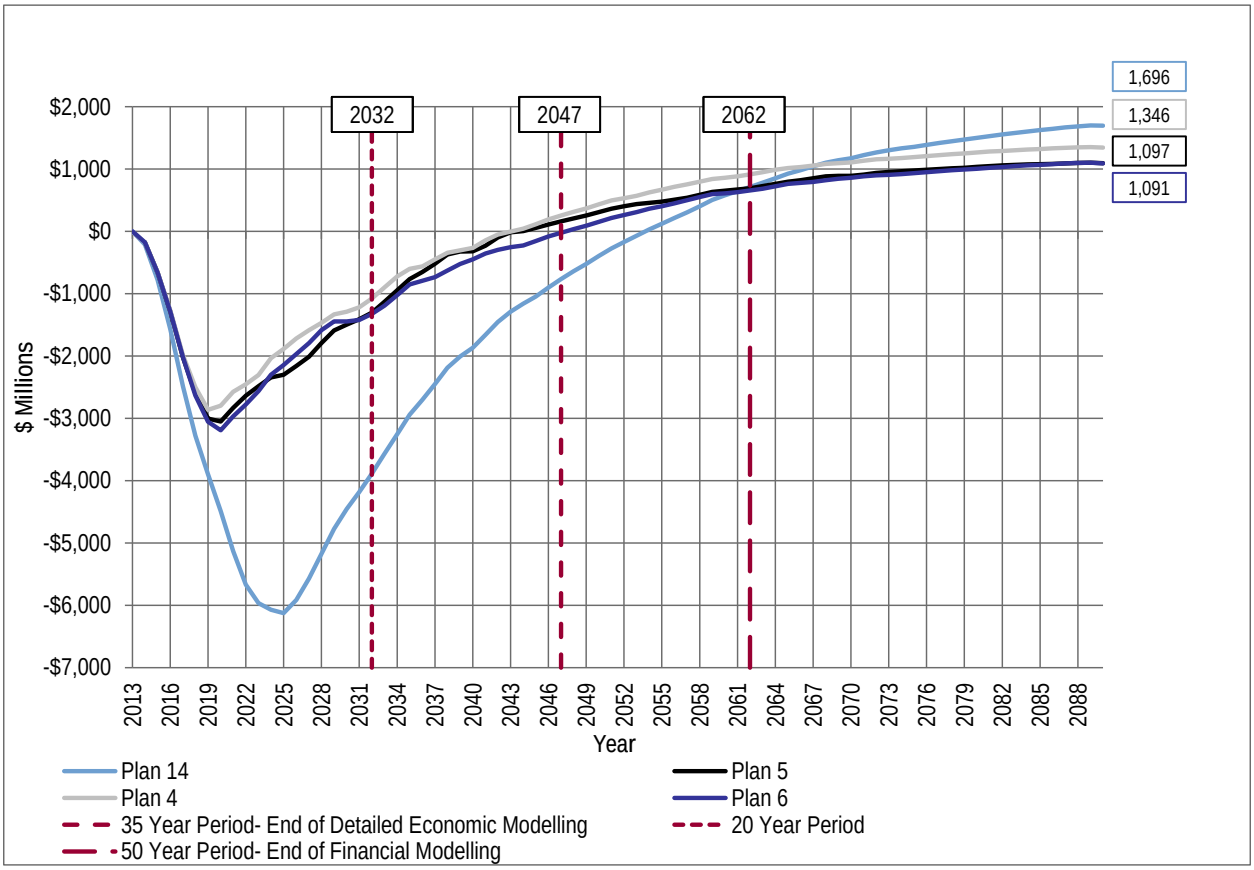
3. Figure 9-5 *Present Value of Invested Capital and NPV of Costs for each Plan through 78 Years Relative to All Gas – Millions of 2014 Present Value Dollars*

- Slight modification to Capital Expenditures Incremental to All Gas as reflected in the updated chart below.


15-K19/C25/750MW
14-K19/C25/750 (WPS)
13-K19/C25/250MW
12-K19/C31/750MW
11-K19/C31/250MW
10-K22/C29
9-Wind/C26
8-CCGT/C26
7-SCGT/C26
6-K19/Gas31/750MW
5-K19/Gas25/750MW (WPS)
4-K19/Gas24/250MW
3-Wind/Gas
2-K22/Gas
1-All Gas
$6,340
$6,199
$5,928
$5,419
$5,174
$4,919
$3,752
$3,099
$2,847
$2,805
$2,746
$2,647
$2,468
$2,192
$0
($2,000)
$0
$2,000
$4,000
$6,000
$8,000
Millions of 2014 Net Present Value Dollars
Plan NPV relative to All Gas
Plan Present Value of Captial Expenditures Incremental to All Gas

4. Figure 9-17 *Incremental CPV Plan 4, 5, 6 and Plan 14 Relative to All Gas Case*

- Changed 20 year period to end at 2032 rather than 2033 and the 35 year period to end at 2047 rather than 2048.



5. Figure 9-21 *Summary- CPVs as Compared to All Gas Plan at the End of Various Periods, Break-Even Year, and a 78 Year IRR – Millions of 2014 Present Value Dollars*

- Slight modification to 78 Year PV of Total Capital Values and 78 year IRR for Plan 12 as reflected in the below updated table.

Plans	78 Year CPV of Total Capital	78 NPV	50 CPV	35 CPV	20 CPV	78 Year IRR	Break Even Year (All Gas) Base Case
2 K22/Gas	$2,192	$887	$477	($191)	($1,394)	6.63%	2051
3 Wind/Gas	$2,468	($775)	($845)	($908)	($814)	N/A	N/A
4 K19/Gas24/250MW	$2,647	$1,346	$917	$254	($1,076)	7.10%	2043
5 K19/Gas25/750MW (WPS)	$2,746	$1,097	$694	$161	($1,302)	6.69%	2044
6 K19/Gas31/750MW	$2,805	$1,091	$657	($21)	($1,323)	6.62%	2048
7 SCGT/C26	$2,847	$738	$178	($686)	($2,508)	5.99%	2059
8 CCGT/C26	$3,099	$784	$174	($716)	($2,633)	5.99%	2059
9 Wind/C26	$3,752	$531	($62)	($1,031)	($2,777)	5.67%	2064
10 K22/C29	$4,919	$806	($112)	($1,501)	($4,247)	5.71%	2064
11 K19/C31/250MW	$5,174	$1,215	$264	($1,087)	($4,041)	6.04%	2059
12 K19/C31/750MW	$5,419	$1,360	$365	($1,119)	($4,182)	6.62%	2058
13 K19/C25/250MW	$5,928	$1,295	$374	($1,019)	($3,899)	5.94%	2058
14 K19/C25/750 (WPS)	$6,199	$1,696	$714	($766)	($3,887)	6.15%	2054
15 K19/C25/750MW	$6,340	$1,427	$445	($1,032)	($4,117)	5.96%	2057

6. Figure 9-41 *Probability Distribution of Plan 14 Preferred Development Plan and Plan 5 K19/Gas25/750MW/WPS & Inv having higher costs than the All Gas Plan after 78 Years using the LCA Methodology and LCA Sensitivity Discount Rates – Millions of 2014 Present Value Dollars*

- Modified caption to read: "The Impact of LCA Discount Rates on the Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan after 78 years – Millions of 2014 Present Value Dollars"

7. Figure 9-42: *Probability Distribution of Selected Plans having higher costs than the All Gas Plan after 78 Years using the LCA Methodology – Millions of 2014 Present Value Dollars*

- Modified caption to read: "The Impact of LCA Discount Rates on the Probability Distributions of the Selected Development Plans having Higher Costs than the All Gas Plan after 78 years – Millions of 2014 Present Value Dollars"

8. Figure 9-43: *Probability Distribution of Selected Plans having higher costs than the All Gas Plan after 50 Years using the LCA Methodology – Millions of 2014 Present Value Dollars*

- Modified caption to read: "The Impact of LCA Discount Rates on the Probability Distributions of the Selected Development Plans having Higher Costs than the All Gas Plan after 50 years – Millions of 2014 Present Value Dollars"

9. Figure 9-44: *Probability Distribution of Selected Plans having higher costs than the All Gas Plan after 35 Years using the LCA Methodology – Millions of 2014 Present Value Dollars*
- Modified caption to read: "The Impact of LCA Discount Rates on the Probability Distributions of the Selected Development Plans having Higher Costs than the All Gas Plan after 35 years – Millions of 2014 Present Value Dollars"

10. Figure 9-15: *Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan after 78 years when eliminating Low Discount Rate Scenarios – Millions of 2014 Present Value Dollars*
- Removed "78 years" in caption to read: "Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan when eliminating Low Discount Rate Scenarios – Millions of 2014 Present Value Dollars"

11. Figure 9-46: *Probability Distribution of Plan 14 Preferred Development Plan and Plan 5 K19/Gas25/750MW/WPS & Inv having higher costs than the All Gas Plan after 78 Years using the LCA Methodology and Eliminating the Low Discount Rate Scenarios – Millions of 2014 Present Value Dollars*
- Modified caption to read: "The Impact of eliminating low discount rates on the Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan after 78 years – Millions of 2014 Present Value Dollars"

12. Figure 9-49: *Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan With Higher Probabilities of Higher Capital Costs after 78 years – Millions of 2014 Present Value Dollars*
- Removed "78 years" in caption to read: "Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan With Higher Probabilities of Higher Capital Costs after– Millions of 2014 Present Value Dollars"

13. Figure 9-54: *Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan with Changing Energy Cost Probabilities after 78 years – Millions of 2014 Present Value Dollars*
- Removed "78 years" in caption to read: "Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan with Changing Energy Cost Probabilities– Millions of 2014 Present Value Dollars"

14. Figure 9-61: *Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan with 10% Higher Capital Costs for the Keeyask G. S. and Conawapa G. S. in the High Capital Cost Scenarios after 78 years – Millions of 2014 Present Value Dollars*
- Removed "78 years" in caption to read: "Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan with 10% Higher Capital Costs for the Keeyask G. S. and Conawapa G. S. in the High Capital Cost Scenarios– Millions of 2014 Present Value Dollars"

15. Figure 9-66: *Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan with Higher Capital Costs for the Keeyask G. S. and Conawapa G. S. in all Scenarios after 78 years – Millions of 2014 Present Value Dollars*
- Removed "78 years" in caption to read: "Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan with Higher Capital Costs for the Keeyask G. S. and Conawapa G. S. in all Scenarios after 78 years – Millions of 2014 Present Value Dollars"

16. Figure 9-71: *Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan with one-half the variation in the High and Low capital cost uncertainty range for Thermal and Wind generation after 78 years – Millions of 2014 Present Value Dollars*
- Removed "78 years" in caption to read: "Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan with one-half the variation in the High and Low capital cost uncertainty range for Thermal and Wind generation– Millions of 2014 Present Value Dollars"

17. Figure 9-73: *Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan assuming NO variation in the High and Low capital cost uncertainty range for Thermal and Wind generation after 78 years – Millions of 2014 Present Value Dollars*
- Removed "78 years" in caption to read: "Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan assuming NO variation in the High and Low capital cost uncertainty range for Thermal and Wind generation– Millions of 2014 Present Value Dollars"

18. Figure 9-74: *Preferred Development Plan Showing the impact of assuming NO variation in the High and Low capital cost uncertainty range for Thermal and Wind generation*
- *Modified caption to read: "The Impact of assuming NO variation in the High and Low* capital cost uncertainty range for Thermal and Wind generation on the Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan after 78 years – Millions of 2014 Present Value Dollars"

19. Figure 9-80: *Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan after 78 years from the Province of Manitoba Perspective by eliminating LCA view of Intra-provincial transfers – Millions of 2014 Present Value Dollars*
- Removed "78 years" in caption to read: "Probability Distributions of the Plan 14 Preferred Development Plan having Higher Costs than the All Gas Plan from the Province of Manitoba Perspective by eliminating LCA view of Intra-provincial transfers – Millions of 2014 Present Value Dollars"

20. Figure 9-87: *Comparative Economic Value after 50 years - Provincial Perspective Millions of 2014 Present Value Dollars*

- Correction to "Manitoba Hydro Perspective" columns as depicted in the updated figure below.

Comparative Economic Value Case Summary Table - NPV after 50 years as compared to ALL Gas					
		Manitoba Hydro Perspective		Province of Manitoba Perspective	
Plan	Description	Reference Scenario	Expected Value	Reference Scenario	Expected Value
Plan 1	All Gas	-	-	-	-
Plan 2	K22/Gas	$477	$228	$800	$550
Plan 3	Wind/Gas	($845)	($1,060)	($698)	($907)
Plan 4	K19/Gas24/250MW	$917	$616	$1,313	$1,012
Plan 5	K19/Gas25/750MW (WPS)	$694	$438	$1,100	$843
Plan 6	K19/Gas31/750MW	$657	$345	$1,069	$756
Plan 7	SCGT/C26	$178	($39)	$596	$372
Plan 8	CCGT/C26	$174	($83)	$612	$350
Plan 9	Wind/C26	($62)	($373)	$417	$103
Plan 10	K22/C29	($112)	($501)	$571	$174
Plan 11	K19/C31/250MW	$264	($149)	$986	$567
Plan 12	K19/C31/750MW	$365	($104)	$1,112	$637
Plan 13	K19/C25/250MW	$374	($139)	$12,226	$705
Plan 14	K19/C25/750 (WPS)	$714	$174	$1,596	$1,049
Plan 15	K19/C25/750MW	$445	($149)	$1,340	$739

21. Figure 9-88: *Comparative Economic Value after 35 years - Provincial Perspective Millions of 2014 Present Value Dollars*

- Correction to "Manitoba Hydro Perspective" columns as depicted in the updated figure below.

Comparative Economic Value Case Summary Table - NPV after 35 years as compared to ALL Gas					
		Manitoba Hydro Perspective		Province of Manitoba Perspective	
Plan	Description	Reference Scenario	Expected Value	Reference Scenario	Expected Value
Plan 1	All Gas	-	-	-	-
Plan 2	K22/Gas	($191)	($400)	$84	($126)
Plan 3	Wind/Gas	($908)	($1,077)	($811)	($976)
Plan 4	K19/Gas24/250MW	$254	($3)	$603	$345
Plan 5	K19/Gas25/750MW (WPS)	$161	($63)	$524	$299
Plan 6	K19/Gas31/750MW	($21)	($293)	$343	$70
Plan 7	SCGT/C26	($686)	($866)	($334)	($519)
Plan 8	CCGT/C26	($716)	($928)	($347)	($563)
Plan 9	Wind/C26	($1,031)	($1,291)	($636)	($900)
Plan 10	K22/C29	($1,501)	($1,819)	($937)	($1,260)
Plan 11	K19/C31/250MW	($1,087)	($1,424)	($482)	($824)
Plan 12	K19/C31/750MW	($1,119)	($1,507)	($495)	($888)
Plan 13	K19/C25/250MW	($1,019)	($1,459)	($283)	($730)
Plan 14	K19/C25/750 (WPS)	($766)	($1,225)	($3)	($467)
Plan 15	K19/C25/750MW	($1,032)	($1,545)	($257)	($776)

22. Figures 9-28, 9-30, 9-31, 9-32, 9-33, 9-34, 9-35, 9-36, 9-41, 9-42, 9-43, 9-44, 9-45, 9-46, 9-50, 9-51, 9-52, 9-53, 9-55, 9-56, 9-57, 9-58, 9-62, 9-63, 9-64, 9-65, 9-67, 9-68, 9-69, 970, 9-72, 9-74, 9-81, 9-82, 9-83, 9-84, 9-85

- All tables should read "95th Percentile – "Reward"" rather than "90th Percentile – "Reward""

23. Figure 9.94 "LCA Alternative Plans and Preferred Development Plan Relative to the All Gas Plan – Millions of 2014 Present Value Dollars

- Plan 17 78 Year NPV reads "1439" and should read "1421"

24. On page 9A-15 of TA 9A, the sentence which reads, "Net production costs or revenues are held constant at their year 35 value on a real dollar basis," should read "Net production costs or revenues are held constant at the average of years 33 to 35 on a real dollar basis."

25. On page 9A-15 of TA 9A, the sentence which reads, "No additional growth in energy or peak load requirements is estimated; therefore, there is no need to add additional resources beyond 2037," contains a typographic error. The reference to "2037" should read "2047".

26. Figure 8-10 of TA 8 Transmission– Corrected confirmed until dates for WPS to 6/1/2023 and GRE to 5/1/2030.

Contract Name	TSR MW	Confirmed until
NSP 375/325	500	5/1/2025
NSP 125		
NSP 350	213	5/1/2025
	137	11/1/2016
WPS*	100	6/1/2029
WPS*	100	6/1/2023
	8	6/1/2023
GRE	200	5/1/2030

27. Figure 8-30 of TA 8 Transmission. The Transmission exposure impact for option 2 was updated to reflect correct comparison.

Development Plans Studies by MH that include Conawapa G. S.						
	Economic Value of Development Plan compared to Plan 1 All Gas - CPV/NPV at the end of specific portions of the Study Period				Transmision Exposure*	
Plans	20 Years	35 Years	50 Years	78 Years	Option 1 Impact	Option 2 Impact
7 SCGT/C26	($2,508)	($686)	$178	$738	No impact	No impact
8 CCGT/C26	($2,633)	($716)	$174	$784	No impact	No impact
9 Wind/C26	($2,777)	($1,031)	($62)	$531	No impact	No impact
10 K22/C29	($4,247)	($1,501)	($112)	$806	($452)	($125)
11 K19/C31/250MW	($4,041)	($1,087)	$264	$1,215	($410)	($113)
12 K19/C31/750MW	($4,182)	($1,119)	$365	$1,360	($410)	($113)
13 K19/C25/250MW	($3,899)	($1,019)	$374	$1,295	($551)	($152)
14 K19/C25/750 (WPS)	($3,887)	($766)	$714	$1,696	($551)	($152)
15 K19/C25/750MW	($4,117)	($1,032)	$445	$1,427	($551)	($152)
* Impact on a present value from increased capital expenditures with the alternative transmisssion options						

28. On Page 8-9 of TA 8 Transmission "Although the firm import limit is 0 MW as figure 8-3 shows, MH may up to 105 MW…" should be ""Although the firm import limit is 0 MW as figure 8-3 shows, MH may *import* up to 105 MW…"
29. Regarding the sentence on page 10A-15, "Due to the application of this rate increase to a higher load base, the annual revenue (requirement) increase from 2030/31 to 2031/32 is 4.14% rather than the 3.43% reported by MH."--The value of 4.14% should be 4.09%.

30. The equation on page 10A-15 should be replaced with the following:

$$[(1+r)^t - 1]\, x\ General\ Consumer\ Revenue\ At\ Approved\ Rates\ (t) = Cumulative\ Rate\ Increase\ (t).$$

31. Figure 10-12 has incorrect year labels and was missing a column. The correct version is found below

Plan (#)	2013	2022	2032	2042	2052	2062	NPV 2012-2062
All Gas (1)	$60.96	$82.62	$115.72	$119.21	$143.32	$168.50	$1,218
Gas/C26 (7)	$60.96	$85.41	$124.69	$109.96	$128.65	$142.89	$1,222
K22/Gas (2)	$60.96	$83.06	$117.05	$115.46	$134.58	$146.44	$1,209
K19/Gas/250 (4)	$60.96	$82.58	$115.58	$112.42	$131.55	$148.33	$1,196
K19/C25/250 (13)	$60.96	$86.18	$127.28	$106.89	$120.03	$128.65	$1,217
K19/C31/750 (12)	$60.96	$85.00	$123.43	$110.55	$121.69	$128.94	$1,214
K19/Gas/750 (6)	$60.96	$83.06	$117.16	$112.24	$131.86	$148.10	$1,202
K19/C25/750 (Preferred)	$60.96	$86.02	$126.65	$104.92	$118.28	$125.59	$1,208

32. On page LCA-15 of LCA's Initial Report, the word "both" should be stricken from the sentence which reads, "Industry sources shows that both solar costs are projected to decline over time."
33. On page 1-11 of TA 1, the formula in footnote 32 referred to a 0.05% loss factor. This should read 5% loss factor.