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Appendix A – Mine Energy Data

Process History													
Report - Processes	Jan-02	Feb-02	Mar-02	Apr-02	May-02	Jun-02	Jul-02	Aug-02	Sep-02	Oct-02	Nov-02	Dec-02	Average
kWh													
FANS	6 763 282	6 323 298	7 031 828	6 755 148	6 977 976	6 714 719	7 371 066	6 855 326	7 163 000	7 213 074	7 079 775	7 152 964	6 950 121
SERVICE WINDER	118 544	114 552	126 338	121 956	127 408	135 749	208 973	197 208	183 242	192 364	198 517	209 747	161 216
WEST MAN WINDER	327 569	331 739	358 088	332 732	369 384	363 299	362 444	371 292	361 696	363 750	365 841	350 936	354 897
EAST MAN WINDER	341 681	372 442	408 626	380 489	401 493	373 951	378 602	359 677	384 114	381 146	387 371	378 844	379 036
WEST ROCK WINDER	762 667	962 720	1 160 809	1 009 127	1 079 092	980 307	1 200 146	1 177 446	1 077 947	1 062 290	1 191 955	1 100 233	1 063 728
EAST ROCK WINDER	1 023 202	1 038 189	1 268 581	1 110 217	1 302 290	1 198 809	1 228 423	1 255 713	1 390 549	1 435 029	1 450 284	1 335 085	1 253 031
UNDERGROUND MAN WINDERS	212 003	200 919	223 049	213 436	222 993	211 493	214 031	217 732	210 890	216 765	219 634	217 496	215 037
UNDERGROUND SERVICE WINDERS	161 311	174 531	187 773	187 240	201 560	191 586	191 804	194 333	188 454	187 364	192 310	191 698	187 497
UNDERGROUND ROCK WINDERS	283 256	560 265	339 568	121 736	209 690	-123 838	96 830	537 891	677 676	1 138 897	1 190 304	1 121 790	6 992 823
UNDERGROUND LOAD MAIN #	614 175	551 034	616 974	770 432	537 029	568 722	582 940	594 876	637 602	552 008	492 223	557 761	589 648
UNDERGROUND LOAD SUB #	7 483 380	7 174 967	7 212 213	6 415 799	7 092 257	6 739 518	7 159 113	7 344 595	7 130 173	6 522 355	6 311 425	5 690 982	6 856 398
PUMPING	9 207 388	9 106 672	12 366 252	12 552 017	12 095 299	10 870 541	10 412 959	9 338 908	8 846 980	10 220 400	9 570 104	11 205 081	10 482 717
REFRIGERATION	8 157 024	8 076 524	9 093 894	7 719 581	6 526 519	5 265 128	4 475 865	5 039 986	5 535 489	7 448 394	7 986 561	8 588 907	7 992 823
COMPRESSORS	8 001 398	7 523 237	8 650 832	7 614 536	7 276 727	7 823 761	7 520 028	7 643 645	8 235 903	8 702 382	9 165 301	8 386 582	8 045 361
SURFACE AREA	1 236 462	1 164 174	1 344 804	1 228 043	1 343 553	1 043 400	909 525	859 499	802 355	1 093 155	1 220 513	1 234 486	1 123 331
Total	44 693 340	43 675 264	50 389 628	46 532 488	45 763 270	42 357 146	42 312 749	41 988 127	42 826 070	46 729 375	47 022 120	47 722 590	45 167 681

Figure A.1: 2002 Energy Data

Report - Processes	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Average
kWh													
FANS	7 271 295	6 555 335	7 227 063	7 187 294	7 501 443	7 294 301	7 480 735	7 566 444	7 202 769	7 433 504	7 152 391	7 335 959	7 267 378
SERVICE WINDER	207 837	198 022	218 555	203 551	196 035	175 619	174 446	188 414	185 456	210 584	210 200	215 555	198 690
WEST MAN WINDER	344 699	333 414	364 888	339 809	365 119	368 757	377 368	376 202	355 725	362 978	349 695	385 621	360 356
EAST MAN WINDER	373 263	365 698	391 585	383 484	399 558	377 756	404 051	388 888	364 991	393 422	380 174	371 464	382 861
WEST ROCK WINDER	984 490	900 608	907 593	928 875	1 087 800	1 160 223	1 152 129	1 234 863	1 132 086	1 058 864	990 954	917 764	1 038 021
EAST ROCK WINDER	1 274 318	1 187 793	1 281 454	1 293 071	1 437 805	1 336 316	1 371 911	1 303 314	1 296 401	1 269 384	1 260 743	1 238 196	1 295 892
UNDERGROUND MAN WINDERS	215 833	204 917	222 129	206 273	212 406	202 616	217 031	210 294	201 375	209 564	207 396	207 641	209 790
UNDERGROUND SERVICE WINDERS	181 180	169 049	176 629	159 825	169 531	152 506	1 170 066	3 457 708	3 429 470	3 624 965	3 509 635	3 566 503	1 647 255
UNDERGROUND ROCK WINDERS	1 012 673	887 187	1 059 481	1 393 857	1 876 786	1 119 239	1 166 100	1 169 527	1 097 779	1 057 854	1 025 149	989 236	1 154 572
UNDERGROUND LOAD MAIN #	706 072	533 061	452 309	421 232	439 898	447 847	354 577	321 951	306 166	600 595	70 796	69 557	393 672
UNDERGROUND LOAD SUB #	5 781 232	5 894 223	6 903 274	6 300 350	6 497 433	7 304 360	6 514 437	4 588 286	4 218 717	3 980 757	3 794 563	3 828 116	5 467 146
PUMPING	12 186 564	10 236 147	11 044 081	9 993 271	9 360 947	9 492 409	8 893 634	9 378 404	8 000 505	11 494 837	11 644 963	11 644 724	10 280 874
REFRIGERATION	8 979 847	8 539 013	8 735 728	7 801 225	7 163 419	5 390 971	4 740 223	4 740 529	4 919 836	7 292 258	8 373 900	8 493 846	7 097 566
COMPRESSORS	8 795 371	7 772 758	8 587 074	7 547 391	8 381 705	7 595 804	7 476 342	7 340 758	6 955 577	7 575 005	7 878 713	9 021 826	7 910 694
SURFACE AREA	1 220 254	1 154 929	1 258 907	1 209 869	1 324 109	985 320	926 229	835 559	763 277	1 209 789	1 337 064	1 372 559	1 133 155
Total	49 534 928	44 932 155	48 830 749	45 369 376	46 413 995	43 404 045	42 419 278	43 101 140	40 430 131	47 774 363	48 186 338	49 658 568	45 837 922

Figure A.2: 2003 Energy Data

Report - Processes	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Average
kWh													
FANS	7 436 468	7 067 478	7 377 754	6 371 301	9 040 166	7 728 928	7 945 910	7 725 713	7 627 042	7 575 005	7 224 056	7 484 087	7 550 326
SERVICE WINDER	191 501	196 808	205 384	200 152	206 777	198 750	227 934	225 362	224 770	224 918	217 049	220 756	211 680
WEST MAN WINDER	371 646	380 703	418 871	415 642	438 714	410 494	443 033	410 507	420 364	411 709	405 217	399 255	410 513
EAST MAN WINDER	331 126	344 699	348 013	350 731	357 192	335 856	356 010	327 067	343 766	341 283	331 570	350 618	343 161
WEST ROCK WINDER	791 700	785 180	807 415	548 500	693 538	556 657	691 375	606 137	635 619	502 944	491 571	349 964	621 717
EAST ROCK WINDER	1 045 913	1 056 859	1 143 958	1 048 048	1 115 310	1 150 254	1 308 054	1 047 263	1 188 063	1 079 943	1 144 105	1 256 208	1 131 998
UNDERGROUND MAN WINDERS	196 631	197 793	211 911	211 679	218 402	206 088	217 607	207 237	209 233	208 883	207 818	211 173	208 705
UNDERGROUND SERVICE WINDERS	3 502 466	3 420 416	3 780 881	3 795 802	3 495 275	2 901 173	3 823 033	3 798 104	1 088 009	150 557	135 061	131 256	2 501 836
UNDERGROUND ROCK WINDERS	842 896	852 464	915 827	879 499	1 001 820	964 168	1 123 156	967 133	1 070 340	2 991 087	3 082 021	3 333 267	1 501 973
UNDERGROUND LOAD MAIN #	119 305	117 238	107 359	464 177	575 913	550 119	595 229	171 996	43 530	28 006	3 379	35 700	234 329
UNDERGROUND LOAD SUB #	3 866 769	3 793 701	4 332 970	3 985 051	4 388 823	4 754 760	3 538 901	4 287 841	6 148 577	6 489 537	6 165 469	6 112 376	4 822 065
PUMPING	12 261 777	10 841 460	11 095 195	12 313 148	12 310 935	10 133 778	11 591 517	9 897 554	11 366 421	11 557 251	12 006 545	12 337 403	11 476 082
REFRIGERATION	8 440 917	7 550 741	7 782 958	7 780 693	7 081 262	4 352 338	4 766 846	4 356 630	5 513 450	6 658 102	7 764 887	8 379 958	6 702 399
COMPRESSORS	8 945 012	8 650 208	9 252 382	9 458 756	9 378 905	8 447 424	9 955 461	8 898 860	9 027 762	9 358 772	10 204 782	10 439 973	9 334 858
SURFACE AREA	1 295 815	1 255 529	1 304 722	1 267 800	1 308 371	1 006 434	895 351	845 452	1 243 162	1 364 991	1 311 906	1 323 254	1 201 899
Total	49 639 942	46 511 277	49 085 600	49 090 979	51 611 403	43 697 221	47 479 417	43 772 856	46 150 108	48 942 988	50 695 436	52 365 248	48 253 540

Figure A.3: 2004 Energy Data

Report - Processes	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Average
kWh													
FANS	7 120 997	6 713 505	7 526 032	7 442 252	7 715 240	7 436 560	7 786 128	7 756 839	7 450 528	7 622 588	7 315 064	7 557 665	7 453 617
SERVICE WINDER	209 635	195 790	201 462	208 077	208 173	197 002	200 375	199 411	201 584	220 448	224 732	236 909	208 633
WEST MAN WINDER	359 724	344 803	392 466	353 831	368 200	380 385	388 985	343 452	385 071	394 197	375 541	386 147	372 734
EAST MAN WINDER	317 314	312 943	339 933	299 054	310 757	321 777	328 696	296 634	316 595	332 104	316 504	336 633	319 079
WEST ROCK WINDER	341 111	602 403	624 365	586 738	592 067	618 546	694 850	470 015	629 807	635 190	549 264	715 420	588 315
EAST ROCK WINDER	942 227	1 044 483	1 115 635	718 841	812 413	972 011	1 250 094	960 475	1 172 916	1 233 359	1 097 038	1 143 583	1 038 590
UNDERGROUND MAN WINDERS	199 205	190 928	211 928	194 373	204 028	199 962	200 386	191 534	204 424	215 417	202 473	208 686	201 945
UNDERGROUND SERVICE WINDERS	122 559	118 706	122 169	107 670	127 411	130 694	132 636	123 828	128 949	146 641	135 618	145 644	128 544
UNDERGROUND ROCK WINDERS	2 658 289	2 309 620	3 179 944	2 415 512	2 477 383	2 846 319	3 723 493	2 643 630	2 572 810	1 507 778	1 066 797	1 193 701	2 382 940
UNDERGROUND LOAD MAIN #	134 228	64 086	82 192	100 893	130 160	129 642	176 866	149 542	97 448	84 507	195 439	122 348	122 279
UNDERGROUND LOAD SUB #	6 386 667	6 154 251	6 387 211	6 730 867	7 122 986	6 615 259	5 946 171	6 634 785	6 766 111	8 119 242	8 289 837	8 783 039	6 994 702
PUMPING	11 671 407	10 375 113	10 593 782	10 066 268	10 974 923	10 408 079	11 501 320	10 433 075	12 737 810	12 851 714	10 097 165	9 829 552	10 961 684
REFRIGERATION	8 210 385	7 991 215	8 061 338	7 532 433	6 328 164	4 740 024	4 058 657	3 883 995	5 223 971	6 786 711	7 029 239	7 167 704	6 417 820
COMPRESSORS	8 358 100	9 685 067	9 947 604	9 365 675	10 482 195	9 850 223	9 580 486	9 281 361	10 001 136	11 847 241	11 580 046	11 569 020	10 129 013
SURFACE AREA	1 239 526	1 174 685	1 290 310	1 271 372	1 350 036	936 623	801 817	722 182	844 780	1 206 566	1 183 886	1 222 469	1 103 688
Total	48 271 374	47 277 598	50 076 371	47 393 856	49 204 136	45 783 106	46 770 960	44 090 758	48 733 940	53 203 703	49 658 644	50 618 520	48 423 580

Figure A.4: 2005 Energy Data

Report - Processes	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Average
kWh													
FANS	7 584 095	6 879 127	7 259 894	7 163 530	7 200 849	7 083 547	7 553 011	7 403 839	7 056 242	7 344 589	7 123 857	7 407 273	7 254 988
SERVICE WINDER	225 186	161 027	95 801	114 621	119 348	119 064	120 715	119 902	118 763	115 754	115 455	122 599	129 020
WEST MAN WINDER	351 030	351 625	390 310	397 067	379 072	388 215	396 721	404 288	399 241	403 414	437 271	405 764	392 001
EAST MAN WINDER	305 415	297 633	329 020	333 696	314 129	313 246	327 746	317 382	323 857	298 631	253 592	311 346	310 475
WEST ROCK WINDER	450 051	493 776	652 561	531 598	423 496	603 820	533 445	521 797	584 114	507 583	673 561	608 481	548 690
EAST ROCK WINDER	924 373	1 076 049	1 095 257	1 148 760	977 184	1 264 022	1 240 872	1 183 533	1 310 857	1 164 709	1 182 390	1 257 455	1 152 122
UNDERGROUND MAN WINDERS	192 316	188 032	206 583	202 009	335 683	196 997	407 835	200 457	202 989	207 492	207 814	213 365	230 131
UNDERGROUND SERVICE WINDERS	122 006	350 773	126 654	131 581	116 832	120 281	135 562	134 386	115 370	125 137	110 223	122 830	142 636
UNDERGROUND ROCK WINDERS	941 148	1 082 222	1 136 072	981 979	937 913	1 088 242	1 145 486	1 049 839	1 169 048	979 201	1 070 012	1 030 652	1 050 984
UNDERGROUND LOAD MAIN #	204 452	484 955	113 728	1 821 603	2 301 869	2 478 187	4 132 084	3 642 062	3 413 033	3 749 687	3 386 353	3 327 892	2 421 326
UNDERGROUND LOAD SUB #	8 612 442	7 074 454	9 321 428	7 312 653	7 050 751	6 750 276	5 243 616	5 815 010	5 671 229	5 509 162	5 333 950	5 316 498	6 584 289
PUMPING	9 101 085	9 589 190	10 587 917	8 804 034	9 471 139	9 619 213	10 153 134	9 590 345	9 640 186	8 874 912	8 368 840	9 361 966	9 430 163
REFRIGERATION	7 215 293	8 267 269	8 491 397	7 161 010	5 013 265	5 031 701	5 239 822	5 261 606	5 553 405	6 557 619	8 158 522	8 307 100	6 688 168
COMPRESSORS	9 950 565	10 266 380	10 657 963	10 352 458	10 279 844	9 341 725	10 459 863	10 342 723	9 957 462	10 179 099	10 292 642	10 302 194	10 198 576
SURFACE AREA	1 107 737	1 124 145	1 262 425	1 238 925	978 083	735 832	763 544	750 679	744 448	1 184 424	1 239 462	1 263 279	1 032 749
Total	47 287 195	47 686 658	51 727 011	47 695 526	45 899 458	45 134 368	47 853 458	46 737 847	46 260 244	47 201 413	47 953 944	49 358 694	47 566 318

Figure A.5: 2006 Energy Data

Report - Processes	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07	Average
kWh													
FANS	6 656 856	6 771 166	7 564 201	7 348 852	7 562 724	6 388 413	7 574 147	7 589 833	7 301 401	7 538 941	7 335 053	6 510 586	7 178 514
SERVICE WINDER	115 048	137 596	191 624	180 955	185 989	184 336	181 365	193 091	197 073	194 557	193 460	198 123	179 435
WEST MAN WINDER	323 443	351 979	393 883	366 833	389 362	416 869	401 558	418 957	432 029	428 761	385 312	393 555	391 878
EAST MAN WINDER	279 283	301 203	333 865	301 260	312 131	197 135	289 045	281 972	263 286	261 925	321 987	326 817	289 159
WEST ROCK WINDER	440 248	472 319	816 379	732 030	636 979	724 308	808 006	738 770	794 613	447 478	634 314	651 333	658 065
EAST ROCK WINDER	867 907	1 167 645	1 349 339	1 217 377	1 120 291	1 284 797	1 285 117	1 373 726	1 376 789	1 152 699	1 175 701	1 143 719	1 209 592
UNDERGROUND MAN WINDERS	188 434	191 759	213 432	198 961	195 006	204 569	203 830	207 613	206 776	199 390	209 511	206 923	202 184
UNDERGROUND SERVICE WINDERS	96 219	95 456	121 031	105 176	96 964	94 299	85 816	111 276	128 089	144 311	142 014	148 052	114 059
UNDERGROUND ROCK WINDERS	765 410	901 215	1 167 753	1 053 301	1 011 978	1 177 955	1 197 134	1 141 538	1 180 588	897 607	997 901	979 721	1 039 342
UNDERGROUND LOAD MAIN #	3 321 856	2 883 790	3 248 570	3 251 766	3 283 772	3 296 438	3 191 558	3 215 185	3 062 703	2 992 971	3 020 212	3 096 084	3 155 409
UNDERGROUND LOAD SUB #	5 222 243	4 877 740	5 458 008	5 372 460	5 416 229	5 443 944	5 611 216	5 701 502	5 537 043	5 576 785	5 736 475	5 852 397	5 483 837
PUMPING	8 030 597	10 099 529	11 313 845	11 606 819	11 276 021	9 927 903	9 151 915	8 963 844	10 373 021	10 813 446	10 638 177	10 680 522	10 239 637
REFRIGERATION	6 753 395	8 000 619	8 771 688	8 325 452	6 095 377	3 999 962	4 216 070	4 911 183	6 221 035	7 154 996	8 314 230	8 976 506	6 811 709
COMPRESSORS	9 076 982	10 029 184	11 137 571	10 745 692	10 924 627	10 989 575	11 559 110	11 170 687	10 287 494	10 264 849	8 553 500	7 898 893	10 219 847
SURFACE AREA	1 190 480	1 155 990	1 296 869	1 227 065	1 244 062	653 122	761 203	740 615	780 739	1 125 324	1 271 535	1 191 257	1 053 188
Total	43 328 401	47 437 189	53 378 059	52 033 999	49 751 513	44 983 624	46 517 087	46 759 790	48 142 677	49 194 040	48 929 382	48 254 486	48 225 854

Figure A.6: 2007 Energy Data

Report - Processes	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Average
kWh													
FANS	6 761 731	5 324 117	5 152 848	5 329 289	5 262 866	9 182 290	8 255 392	7 467 532	7 026 258	6 911 023	6 948 697	7 935 503	6 796 462
SERVICE WINDER	204 926	209 758	230 340	217 847	207 477	203 619	211 517	143 373	143 733	157 322	151 493	153 581	186 249
WEST MAN WINDER	305 207	358 573	394 961	384 763	388 067	356 493	405 895	390 305	393 908	398 711	399 100	389 343	380 444
EAST MAN WINDER	283 275	297 697	327 295	315 096	306 015	276 842	309 912	319 813	289 197	329 188	305 520	324 247	307 008
WEST ROCK WINDER	337 124	601 851	756 855	708 370	691 266	615 462	692 855	706 901	701 503	809 183	842 775	891 963	696 342
EAST ROCK WINDER	724 976	1 109 706	1 247 176	1 159 392	1 235 341	1 146 941	1 364 816	1 257 927	1 238 524	1 160 620	1 182 669	1 166 558	1 166 220
UNDERGROUND MAN WINDERS	170 938	182 617	198 571	184 522	188 156	170 762	191 626	190 543	187 545	202 077	191 423	196 268	187 921
UNDERGROUND SERVICE WINDERS	135 116	153 228	212 514	162 884	166 715	149 529	163 638	163 507	171 357	174 275	165 324	163 194	165 107
UNDERGROUND ROCK WINDERS	570 030	916 421	1 054 837	994 410	2 794 625	3 049 307	1 165 964	1 025 815	1 017 279	1 649 479	1 056 083	1 077 431	1 364 307
UNDERGROUND LOAD MAIN #	3 020 987	2 821 495	3 038 185	3 040 658	3 048 091	2 753 474	2 858 634	2 881 373	2 744 474	2 884 519	2 712 795	2 878 990	2 890 306
UNDERGROUND LOAD SUB #	5 713 841	5 692 836	6 019 760	6 122 792	4 369 602	3 680 804	6 130 598	5 950 495	5 849 062	5 596 179	6 058 966	6 441 287	5 635 519
PUMPING	7 740 620	9 522 535	10 108 348	9 456 946	9 236 268	8 531 855	10 083 723	9 762 818	8 961 859	9 650 060	9 992 123	10 446 596	9 457 813
REFRIGERATION	7 114 502	8 744 230	9 126 294	7 730 464	6 582 189	4 715 139	4 965 108	4 737 723	4 654 937	6 855 960	8 332 619	9 237 975	6 899 762
COMPRESSORS	7 552 378	7 069 247	8 738 557	8 117 818	8 272 385	7 379 961	8 717 732	9 307 086	9 723 757	9 870 564	10 358 939	11 020 029	8 844 038
SURFACE AREA	1 093 714	1 014 037	1 162 162	1 111 163	1 102 093	687 723	725 617	674 240	792 143	1 209 266	1 173 375	1 202 075	995 634
Total	41 729 364	44 018 350	47 768 704	45 036 413	43 851 153	42 900 201	46 243 028	44 979 452	43 895 535	47 858 427	49 871 902	53 525 039	45 973 131

Figure A.7: 2008 Energy Data

Report - Processes	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Average
kWh													
FANS	5 750 155	6 977 369	7 704 448	7 033 162	7 841 534	7 664 760	8 230 622	8 125 226	7 725 733	7 862 029	7 680 090	6 741 878	7 444 750
SERVICE WINDER	149 162	144 146	157 509	144 485	150 006	144 895	157 721	148 792	153 779	165 553	157 215	177 028	154 191
WEST MAN WINDER	344 725	361 789	401 930	388 574	398 410	399 990	430 971	403 662	399 993	395 903	397 603	340 566	388 676
EAST MAN WINDER	306 419	306 225	337 527	311 898	323 018	325 401	343 325	333 931	335 822	342 112	346 632	343 087	329 616
WEST ROCK WINDER	495 807	677 608	657 998	816 793	822 508	876 755	795 813	714 621	747 392	591 661	691 214	698 013	715 515
EAST ROCK WINDER	766 713	1 043 632	1 240 432	1 116 318	1 315 090	1 272 217	1 439 509	1 356 609	1 251 693	1 313 911	1 284 638	1 166 895	1 213 971
UNDERGROUND MAN WINDERS	184 959	177 822	197 030	192 848	196 331	190 788	203 899	196 245	194 709	198 736	195 975	181 123	192 539
UNDERGROUND SERVICE WINDERS	54 510	76 338	86 057	76 955	124 419	141 072	155 073	160 428	161 490	162 388	161 741	145 898	125 531
UNDERGROUND ROCK WINDERS	629 282	920 642	1 049 972	1 092 158	3 076 975	1 167 004	1 280 056	1 176 290	1 129 207	1 074 582	1 068 825	976 625	1 220 135
UNDERGROUND LOAD MAIN #	3 179 515	2 570 331	2 821 201	2 608 558	2 722 596	2 656 293	2 807 691	2 736 307	2 763 666	2 803 676	2 570 114	2 249 964	2 707 493
UNDERGROUND LOAD SUB #	6 525 066	5 986 695	6 799 868	6 535 298	5 124 341	6 981 326	7 506 704	7 286 117	6 650 685	7 151 717	7 489 080	6 915 861	6 746 063
PUMPING	7 699 165	10 870 486	12 350 046	11 356 963	12 239 802	12 426 238	13 155 083	12 671 394	13 235 781	15 234 075	14 883 299	12 900 281	12 418 551
REFRIGERATION	7 390 121	9 242 198	8 769 814	7 455 754	5 882 621	4 707 497	4 418 217	4 298 755	5 985 389	8 411 700	8 679 890	8 383 975	6 968 828
COMPRESSORS	8 008 267	11 326 494	12 392 549	10 700 847	11 464 545	10 227 559	10 390 344	10 269 152	10 623 037	10 686 640	10 882 739	9 454 347	10 535 543
SURFACE AREA	1 095 118	943 280	1 074 654	1 060 600	1 163 354	941 872	834 343	804 070	811 305	1 269 588	1 220 572	1 096 098	1 026 238
Total	42 578 983	51 625 056	56 041 037	50 891 211	52 845 552	50 123 667	52 149 369	50 681 599	52 169 682	57 664 273	57 709 628	51 771 640	52 187 641

Figure A.8: 2009 Energy Data

Report - Processes	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Average
kWh													
FANS	8 239 315	7 787 480	6 336 466	5 392 183	7 178 037	7 765 595	7 481 211	6 517 427	7 479 415	7 738 431	7 919 671	7 576 254	7 284 290
SERVICE WINDER	232 182	262 344	238 989	243 429	222 886	242 376	231 739	246 593	258 918	248 532	258 182	239 516	243 807
WEST MAN WINDER	290 210	352 761	322 592	337 426	315 083	337 117	312 098	322 252	366 755	380 262	388 683	374 104	341 612
EAST MAN WINDER	361 055	408 641	364 497	382 585	357 481	370 997	351 979	371 247	344 274	297 256	332 106	314 809	354 744
WEST ROCK WINDER	488 080	890 428	982 807	817 902	756 595	854 695	803 174	762 481	944 355	856 335	939 032	795 235	824 260
EAST ROCK WINDER	821 048	1 474 601	1 339 740	1 155 460	1 063 243	1 241 946	1 039 798	1 088 278	1 180 811	1 099 122	1 262 829	1 070 373	1 153 104
UNDERGROUND MAN WINDERS	185 263	204 092	188 640	197 886	187 091	200 622	188 338	198 169	201 123	184 871	201 657	195 533	194 441
UNDERGROUND SERVICE WINDERS	104 982	168 672	153 620	151 243	143 258	156 811	151 285	157 281	168 840	163 969	170 079	778 136	205 681
UNDERGROUND ROCK WINDERS	674 850	1 207 474	1 116 208	923 560	914 730	1 066 085	947 972	888 786	1 049 769	935 367	1 064 967	932 110	976 823
UNDERGROUND LOAD MAIN #	3 015 018	2 976 502	2 997 067	3 006 014	2 873 711	2 978 051	2 820 816	2 879 211	2 849 699	2 795 534	2 729 353	2 691 087	2 884 339
UNDERGROUND LOAD SUB #	7 830 791	7 789 099	7 159 730	7 919 296	7 520 607	7 983 352	7 842 552	8 218 858	8 084 214	7 776 767	7 957 509	7 066 894	7 762 472
PUMPING	11 365 095	16 107 221	13 780 942	14 599 799	13 570 537	14 637 930	13 551 672	12 963 748	14 096 028	16 038 525	17 731 924	15 587 939	14 502 613
REFRIGERATION	9 234 366	10 585 956	10 049 998	12 118 824	9 946 676	7 518 226	7 101 811	6 721 885	7 073 066	8 571 916	9 909 806	9 561 851	9 032 865
COMPRESSORS	9 039 445	11 195 044	9 394 051	10 560 255	10 023 470	10 220 233	9 080 124	9 608 474	9 929 997	10 201 276	10 674 695	9 645 070	9 964 344
SURFACE AREA	1 203 623	1 312 782	1 128 627	1 205 665	1 210 434	1 050 757	741 092	742 678	1 059 222	1 161 652	1 236 160	1 118 556	1 097 604
Total	53 085 323	62 723 097	55 553 974	59 011 527	56 283 839	56 624 793	52 645 662	51 687 368	55 086 485	58 449 815	62 776 654	57 947 466	56 823 000

Figure A.9: 2010 Energy Data

Report - Processes	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Average
kWh													
FANS	6 821 618	7 798 854	7 090 066	7 800 888	7 637 144	5 654 500	5 033 845	7 526 252	8 066 241	7 694 281	7 780 516	7 418 151	7 193 530
SERVICE WINDER	230 374	260 247	231 460	247 620	220 535	229 817	225 738	221 348	264 851	233 972	258 961	246 251	239 264
WEST MAN WINDER	345 427	402 640	362 941	394 260	352 147	369 075	358 854	319 326	390 773	389 841	398 309	381 353	372 079
EAST MAN WINDER	275 536	332 695	303 020	325 172	282 030	279 178	277 707	291 118	321 570	320 260	340 315	342 825	307 619
WEST ROCK WINDER	572 290	833 109	673 132	758 009	769 600	152 256	866 441	478 643	347 060	748 282	802 143	827 586	652 379
EAST ROCK WINDER	759 025	1 207 431	1 099 838	1 354 941	1 189 315	1 166 593	1 307 836	954 672	1 173 719	1 284 792	1 300 236	1 127 175	1 160 464
UNDERGROUND MAN WINDERS	183 073	209 381	194 226	205 652	185 470	193 348	188 474	185 263	207 115	199 369	207 740	194 018	196 094
UNDERGROUND SERVICE WINDERS	126 619	162 926	155 392	176 956	147 656	160 413	161 355	152 294	172 228	167 786	181 393	168 709	161 144
UNDERGROUND ROCK WINDERS	659 212	976 928	857 233	1 028 651	912 525	943 223	962 850	700 121	828 452	954 208	1 013 167	910 620	895 599
UNDERGROUND LOAD MAIN #	2 567 701	2 717 806	2 411 828	2 762 849	2 735 475	2 633 989	2 604 697	2 641 385	2 920 603	2 693 832	2 732 559	2 642 365	2 672 091
UNDERGROUND LOAD SUB #	7 360 946	8 227 734	7 581 751	8 371 252	7 626 528	8 259 619	8 274 607	8 313 638	8 677 077	8 547 933	8 946 479	8 813 445	8 250 084
PUMPING	13 487 771	16 982 345	14 287 068	16 313 772	13 590 551	15 489 051	15 734 481	14 636 367	16 247 263	13 881 782	14 230 620	13 901 094	14 898 514
REFRIGERATION	9 860 600	12 649 873	10 873 709	12 140 658	8 962 071	7 639 978	7 387 207	7 224 750	9 069 626	8 407 925	10 132 156	10 346 361	9 557 910
COMPRESSORS	9 117 889	10 995 061	9 127 580	9 767 244	8 630 031	8 735 642	8 495 351	7 802 351	8 785 397	8 271 738	8 736 138	8 795 441	8 938 322
SURFACE AREA	1 086 031	1 204 322	1 083 610	1 149 190	1 077 479	887 969	740 382	708 901	711 010	772 898	1 239 635	1 301 183	996 884
Total	53 454 113	64 961 352	56 332 855	62 797 114	54 318 556	52 794 652	52 619 824	52 156 430	58 182 985	54 568 898	58 300 369	57 416 578	56 491 977

Figure A.10: 2011 Energy Data

Report - Processes	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Average
kWh													
FANS	7 961 393	8 002 556	6 963 254	6 946 935	6 756 337	7 038 480	7 282 697	7 493 767	7 450 724	9 098 244	7 239 155	7 176 944	7 450 874
SERVICE WINDER	230 599	252 650	237 367	169 649	167 474	167 791	163 246	168 119	164 970	175 973	152 925	151 126	183 491
WEST MAN WINDER	358 354	399 244	362 076	331 454	325 013	337 019	345 756	350 005	358 928	317 629	311 779	353 980	345 936
EAST MAN WINDER	308 056	351 450	320 406	237 288	233 876	241 016	218 291	230 478	223 534	130 095	166 036	170 257	235 898
WEST ROCK WINDER	490 602	769 676	518 958	541 937	609 043	682 998	726 757	683 577	618 469	259 431	274 261	394 133	547 487
EAST ROCK WINDER	775 806	1 243 164	1 017 234	1 081 284	1 092 193	1 052 435	1 196 540	1 152 426	1 145 696	434 132	592 346	684 096	955 613
UNDERGROUND MAN WINDERS	180 882	207 885	188 646	183 762	178 073	183 824	184 299	186 001	180 974	182 604	157 187	174 970	182 426
UNDERGROUND SERVICE WINDERS	131 270	182 756	162 111	162 296	153 154	164 358	163 209	162 454	154 930	141 969	117 184	136 544	152 686
UNDERGROUND ROCK WINDERS	591 706	974 854	680 621	833 927	899 107	900 334	1 017 568	972 793	925 529	358 549	447 079	583 221	765 441
UNDERGROUND LOAD MAIN #	2 941 406	3 138 262	3 128 409	4 374 392	3 952 435	3 831 646	5 397 497	5 338 240	3 637 845	4 594 782	2 630 042	2 903 337	3 822 358
UNDERGROUND LOAD SUB #	9 010 283	9 612 970	8 932 136	9 291 752	8 861 204	8 782 972	7 281 986	7 927 665	9 822 979	12 068 117	8 807 838	9 394 786	9 149 557
PUMPING	13 398 413	14 592 367	12 441 594	11 892 042	13 707 578	15 334 916	15 312 621	16 068 390	17 018 166	14 480 942	14 663 127	13 466 328	14 364 707
REFRIGERATION	10 652 346	11 622 855	10 617 675	12 079 569	9 513 376	8 544 538	8 311 258	8 284 594	9 652 585	9 225 898	10 898 711	11 460 989	10 072 033
COMPRESSORS	7 765 960	9 326 711	8 522 904	9 028 882	9 183 635	8 994 441	9 097 462	9 062 201	8 735 758	7 884 028	8 939 773	8 991 099	8 794 404
SURFACE AREA	1 374 756	1 473 155	1 355 507	1 267 682	1 101 171	913 747	677 924	685 767	1 095 757	1 355 258	1 075 716	1 133 886	1 125 861
Total	56 171 833	62 150 555	55 448 895	58 422 850	56 733 669	57 170 514	57 377 110	58 766 478	61 186 843	60 707 649	56 473 159	57 175 696	58 148 771

Figure A.11: 2012 Energy Data

Summary (kWh)													
kWh	January	February	March	April	May	June	July	August	September	October	November	December	Average Year
2002	44 693 340	43 675 264	50 389 628	46 532 488	45 763 270	42 357 146	42 312 749	41 988 127	42 826 070	46 729 375	47 022 120	47 722 590	45 167 681
2003	49 534 928	44 932 155	48 830 749	45 369 376	46 413 995	43 404 045	42 419 278	43 101 140	40 430 131	47 774 363	48 186 338	49 658 568	45 837 922
2004	49 639 942	46 511 277	49 085 600	49 090 979	51 611 403	43 697 221	47 479 417	43 772 856	46 150 108	48 942 988	50 695 436	52 365 248	48 253 540
2005	48 271 374	47 277 598	50 076 371	47 393 856	49 204 136	45 783 106	46 770 960	44 090 758	48 733 940	53 203 703	49 658 644	50 618 520	48 423 580
2006	47 287 195	47 686 658	51 727 011	47 695 526	45 899 458	45 134 368	47 853 458	46 737 847	46 260 244	47 201 413	47 953 944	49 358 694	47 566 318
2007	43 328 401	47 437 189	53 378 059	52 033 999	49 751 513	44 983 624	46 517 087	46 759 790	48 142 677	49 194 040	48 929 382	48 254 486	48 225 854
2008	41 729 364	44 018 350	47 768 704	45 036 413	43 851 153	42 900 201	46 243 028	44 979 452	43 895 535	47 858 427	49 871 902	53 525 039	45 973 131
2009	42 578 983	51 625 056	56 041 037	50 891 211	52 845 552	50 123 667	52 149 369	50 681 599	52 169 682	57 664 273	57 709 628	51 771 640	52 187 641
2010	53 085 323	62 723 097	55 553 974	59 011 527	56 283 839	56 624 793	52 645 662	51 687 368	55 086 485	58 449 815	62 776 654	57 947 466	56 823 000
2011	53 454 113	64 961 352	56 332 855	62 797 114	54 318 556	52 794 652	52 619 824	52 156 430	58 182 985	54 568 898	58 300 369	57 416 578	56 491 977
2012	56 171 833	62 150 555	55 448 895	58 422 850	56 733 669	57 170 514	57 377 110	58 766 478	61 186 843	60 707 649	56 473 159	57 175 696	58 148 771
Average Month	48 161 345	51 181 686	52 239 353	51 297 758	50 243 322	47 724 849	48 580 722	47 701 986	49 369 518	52 026 813	52 507 052	52 346 775	50 281 765

Figure A.12: Average Monthly Energy Data

Variable (1) Tonnage													
Tonnes Hoisted	January	February	March	April	May	June	July	August	September	October	November	December	Average Year
2002	163 999	187 736	185 464	203 166	185 417	201 875	201 034	202 962	218 086	227 609	218 304	211 338	200 583
2003	212 162	181 380	188 052	202 604	216 479	202 935	214 126	211 736	211 995	198 632	184 348	167 464	199 326
2004	146 195	128 059	156 560	150 234	162 166	150 333	179 651	167 397	173 708	167 731	169 243	159 411	159 224
2005	157 935	171 402	166 945	147 534	170 505	172 020	176 371	150 166	170 021	182 287	161 250	161 798	165 686
2006	164 406	162 781	159 294	173 956	172 656	199 682	187 136	174 447	195 164	191 138	178 133	162 640	176 786
2007	156 994	171 883	216 466	199 373	187 530	202 403	195 822	201 268	210 614	183 466	177 322	170 754	189 491
2008	130 177	180 813	191 056	185 364	185 997	195 148	184 514	199 709	189 939	195 581	194 204	193 241	185 479
2009	147 079	179 684	196 691	182 920	223 652	226 044	225 733	188 400	223 506	192 855	188 065	193 545	197 348
2010	165 376	221 066	219 313	189 162	184 707	210 889	159 933	163 878	191 345	191 860	206 803	174 207	189 878
2011	140 566	179 227	185 647	161 629	196 589	170 226	181 613	115 212	170 471	165 011	192 846	164 580	168 635
2012	146 203	122 022	146 661	143 958	174 788	177 411	175 322	161 361	179 760	761	110 945	123 481	138 556
Average Month	157 372	171 459	182 923	176 355	187 317	191 724	189 205	176 049	194 055	172 448	180 133	171 133	179 181

Figure A.13: Tonnage Variable Info

Variable (2) Average Mining Depth													
Average Mining Depth (km)	January	February	March	April	May	June	July	August	September	October	November	December	Average Year
2002	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
2003	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86
2004	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2005	3.11	3.11	3.11	3.11	3.11	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12
2006	3.12	3.12	3.12	3.12	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13
2007	3.13	3.13	3.13	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14
2008	3.14	3.14	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
2009	3.15	3.15	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16
2010	3.16	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.18	3.17
2011	3.18	3.18	3.19	3.19	3.20	3.20	3.21	3.21	3.22	3.22	3.23	3.23	3.20
2012	3.23	3.24	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25

Figure A.14: Average Mining Depth Variable Info

Variable (3) Virgin Rock Temperature													
Average Virgin Rock Temperature	January	February	March	April	May	June	July	August	September	October	November	December	Average Year
2002	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	47
2003	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47
2004	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49
2005	50.8	50.9	50.9	50.9	50.9	50.9	50.9	50.9	51.0	51.0	51.0	51.0	51
2006	51.0	51.0	51.0	51.0	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1	51
2007	51.1	51.2	51.2	51.2	51.2	51.2	51.2	51.2	51.3	51.3	51.3	51.3	51
2008	51.3	51.3	51.3	51.3	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.5	51
2009	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.6	51.6	51.6	51.6	51.6	52
2010	51.6	51.6	51.6	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.8	52
2011	51.8	51.8	51.9	52.0	52.0	52.1	52.2	52.3	52.3	52.4	52.5	52.5	52
2012	52.5	52.7	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	53

Figure A.15: Virgin Rock Temperature Variable Info

Variable (4) Mean Ambient Temperature													
Mean Ambient Temperature	January	February	March	April	May	June	July	August	September	October	November	December	Average Year
2002	21.70	20.10	20.80	18.90	13.40	10.00	9.70	15.00	17.60	20.70	20.40	20.30	17.38
2003	22.60	22.60	21.10	20.00	13.80	10.50	11.70	13.40	19.90	21.90	21.30	23.90	18.56
2004	23.00	21.70	19.30	16.80	13.10	10.00	8.30	13.80	15.90	20.30	23.60	22.40	17.35
2005	22.80	22.10	19.40	14.00	11.90	10.60	8.50	13.40	17.90	19.60	22.40	20.80	16.95
2006	20.40	21.90	19.60	17.10	11.60	10.40	12.90	12.60	17.50	20.70	21.40	22.40	17.38
2007	23.10	22.80	20.60	16.90	11.60	9.30	9.00	13.00	19.60	18.00	20.00	21.30	17.10
2008	21.20	21.40	18.40	15.20	13.60	9.80	9.70	13.80	16.30	20.70	21.20	22.30	16.97
2009	21.30	20.10	18.60	16.10	12.60	9.70	9.50	13.10	19.80	20.00	20.80	22.90	17.04
2010	21.30	22.50	20.90	17.60	14.20	9.30	10.60	13.30	18.40	20.90	22.90	21.80	17.81
2011	22.70	22.00	22.00	15.00	11.60	7.50	6.40	10.50	16.50	19.00	22.30	22.70	16.52
2012	24.00	23.20	21.50	16.80	16.50	10.20	10.90	14.60	17.10	21.40	22.70	22.10	18.42

Figure A.16: Average Ambient Temperature Variable Info

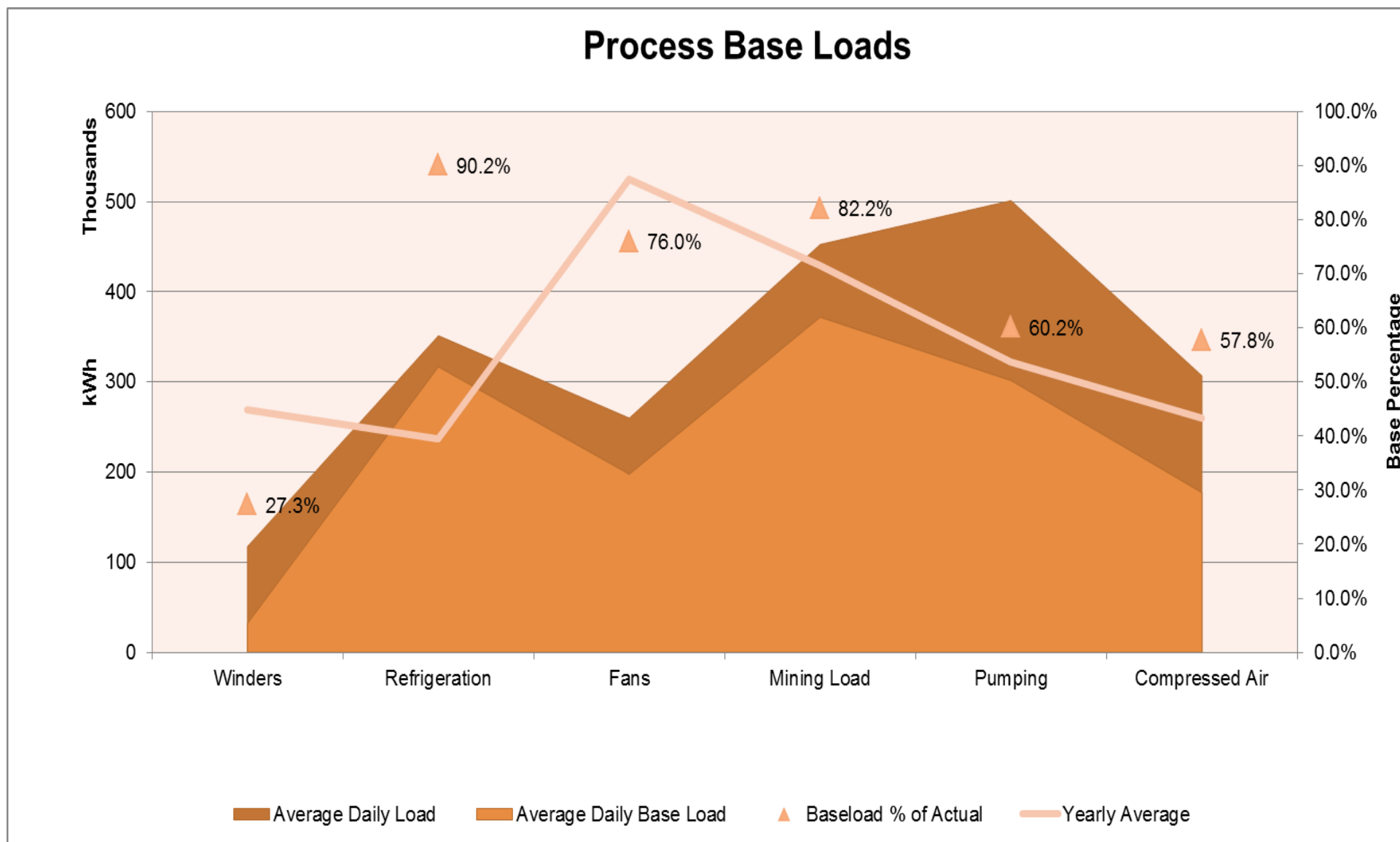


Figure A.17: Process Base Loads

Appendix B – Variable Analysis

1. Total kWh's versus tonnes

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.120010788							
R Square	0.014402589							
Adjusted R Square	0.006580388							
Standard Error	5758851.406							
Observations	128							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	6.10637E+13	6.10637E+13	1.841244952	0.177231041			
Residual	126	4.17871E+15	3.31644E+13					
Total	127	4.23977E+15						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	56597714.36	4058698.718	13.94479322	2.61229E-27	48565668.92	64629759.81	48565668.92	64629759.81
163999	-30.07712949	22.16565661	-1.356924815	0.177231041	-73.94231231	13.78805332	-73.94231231	13.78805332

Figure B.1: Statistical Results Total kWh

2. Total Variable kWh's versus tonnes

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.137977107							
R Square	0.019037682							
Adjusted R Square	0.000871713							
Standard Error	1046988.311							
Observations	56							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1.14879E+12	1.14879E+12	1.047986051	0.310535652			
Residual	54	5.9194E+13	1.09618E+12					
Total	55	6.03428E+13						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	17910537.11	1076137.045	16.6433608	6.45849E-23	15753012.24	20068061.98	15753012.24	20068061.98
130177	-6.000856946	5.861861092	-1.023711898	0.310535652	-17.75318084	5.751466948	-17.75318084	5.751466948

Figure B.2: Statistical Results Variable kWh

3. Total Fans kWh's versus tonnes

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.094581707							
R Square	0.008945699							
Adjusted R Square	0.001322205							
Standard Error	686139.8962							
Observations	132							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	5.52441E+11	5.52441E+11	1.173438128	0.280700989			
Residual	130	6.12024E+13	4.70788E+11					
Total	131	6.17549E+13						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	7661845.18	378650.4672	20.23461172	5.40767E-42	6912730.515	8410959.845	6912730.515	8410959.845
X Variable 1	-2.260510408	2.086778787	-1.083253492	0.280700989	-6.388952672	1.867931855	-6.388952672	1.867931855

Figure B.3: Statistical Results Fans kWh

4. Total Refrigeration kWh's versus tonnes

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.13762269							
R Square	0.018940005							
Adjusted R Square	0.011393389							
Standard Error	2295366.873							
Observations	132							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1.32231E+13	1.32231E+13	2.509735012	0.115574644			
Residual	130	6.84932E+14	5.26871E+12					
Total	131	6.98155E+14						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	13664659.04	1266712.144	10.78750141	9.04675E-20	11158620.56	16170697.53	11158620.56	16170697.53
X Variable 1	-11.05935465	6.980971266	-1.58421432	0.115574644	-24.87037141	2.751662116	-24.87037141	2.751662116

Figure B.4: Statistical Results Refrigeration kWh

5. Total Refrigeration kWh's versus tonnes

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.289026481							
R Square	0.083536307							
Adjusted R Square	0.076486586							
Standard Error	1931125.344							
Observations	132							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	4.419E+13	4.419E+13	11.84959097	0.000776302			
Residual	130	4.84802E+14	3.72925E+12					
Total	131	5.28992E+14						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	11190023.57	1065703.245	10.50013089	4.70272E-19	9081657.149	13298389.98	9081657.149	13298389.98
X Variable 1	-20.21742703	5.873192081	-3.442323484	0.000776302	-31.83683516	-8.598018898	-31.83683516	-8.598018898

Figure B.5: Statistical Results Pumping kWh

6. Total Compressed Air kWh's versus tonnes

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.150346161							
R Square	0.022603968							
Adjusted R Square	0.015085537							
Standard Error	1179574.168							
Observations	132							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	4.18319E+12	4.18319E+12	3.006474097	0.085303182			
Residual	130	1.80881E+14	1.3914E+12					
Total	131	1.85065E+14						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	8241332.858	650955.1655	12.6603694	1.96424E-24	6953495.914	9529169.803	6953495.914	9529169.803
X Variable 1	6.220391614	3.587475914	1.733918711	0.085303182	-0.87700044	13.31778367	-0.87700044	13.31778367

Figure B.6: Statistical Results Compressed Air kWh

7. Total Mining kWh's versus tonnes

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.250256595							
R Square	0.062628364							
Adjusted R Square	0.055417813							
Standard Error	2283109.157							
Observations	132							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	4.52747E+13	4.52747E+13	8.685655667	0.003802695			
Residual	130	6.77636E+14	5.21259E+12					
Total	131	7.22911E+14						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	12361805.73	1259947.649	9.811364577	2.40895E-17	9869149.991	14854461.47	9869149.991	14854461.47
X Variable 1	-20.46405625	6.943691491	-2.947143645	0.003802695	-34.20131944	-6.726793066	-34.20131944	-6.726793066

Figure B.7: Statistical Results Mining kWh

8. Total Winders kWh's versus tonnes

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.212169048							
R Square	0.045015705							
Adjusted R Square	0.037669672							
Standard Error	1271804.208							
Observations	132							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	9.91178E+12	9.91178E+12	6.127893074	0.014592993			
Residual	130	2.10273E+14	1.61749E+12					
Total	131	2.20185E+14						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	2926948.985	701852.8733	4.170317023	5.52011E-05	1538417.013	4315480.957	1538417.013	4315480.957
X Variable 1	9.575017753	3.867978029	2.475458154	0.014592993	1.922685811	17.22734969	1.922685811	17.22734969

Figure B.8: Statistical Results Winder kWh

9. Total Surface kWh's versus tonnes

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.213870069							
R Square	0.045740406							
Adjusted R Square	0.038399948							
Standard Error	206663.9236							
Observations	132							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	2.66138E+11	2.66138E+11	6.231273819	0.013802219			
Residual	130	5.5523E+12	42709977314					
Total	131	5.81843E+12						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	1362061.173	114048.7409	11.94279886	1.19083E-22	1136429.379	1587692.967	1136429.379	1587692.967
X Variable 1	-1.56897791	0.628533473	-2.496251954	0.013802219	-2.812456217	-0.325499603	-2.812456217	-0.325499603

Figure B.9: Statistical Results Surface kWh

10. Total kWh versus depth

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.647799844							
R Square	0.419644638							
Adjusted R Square	0.415180366							
Standard Error	4450278.212							
Observations	132							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1.86168E+15	1.86168E+15	94.00068754	4.65976E-17			
Residual	130	2.57465E+15	1.9805E+13					
Total	131	4.43633E+15						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-34300624.94	8831700.473	-3.883807546	0.000162903	-51773088.11	-16828161.78	-51773088.11	-16828161.78
X Variable 1	27701260.74	2857156.439	9.695395172	4.65976E-17	22048718.43	33353803.05	22048718.43	33353803.05

Figure B.10: Statistical Results Total kWh versus depth

11. Total Variable kWh versus depth

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.412183674							
R Square	0.169895381							
Adjusted R Square	0.155583233							
Standard Error	1063406.044							
Observations	60							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	1.34238E+13	1.34238E+13	11.8707111	0.001066415			
Residual	58	6.55883E+13	1.13083E+12					
Total	59	7.90121E+13						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-24021488.65	11841117.8	-2.028650424	0.047093513	-47724061.18	-318916.1142	-47724061.18	-318916.1142
X Variable 1	12804575.79	3716437.445	3.445389833	0.001066415	5365317.977	20243833.6	5365317.977	20243833.6

Figure B.11: Statistical Results Total Variable kWh versus depth

12. Total kWh versus ambient temperature

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.17008363							
R Square	0.028928441							
Adjusted R Square	0.02145866							
Standard Error	5756596.36							
Observations	132							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	1.28336E+14	1.28336E+14	3.8727294	0.051205101			
Residual	130	4.30799E+15	3.31384E+13					
Total	131	4.43633E+15						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	47627942.8	1904490.243	25.00823671	1.61745E-51	43860136.62	51395748.98	43860136.62	51395748.98
X Variable 1	207735.8869	105560.8679	1.967925151	0.051205101	-1103.665745	416575.4396	-1103.665745	416575.4396

Figure B.12: Statistical Results Total kWh versus ambient temperature

13. Total kWh versus ambient temperature

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.17008363							
R Square	0.028928441							
Adjusted R Square	0.02145866							
Standard Error	5756596.36							
Observations	132							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1.28336E+14	1.28336E+14	3.8727294	0.051205101			
Residual	130	4.30799E+15	3.31384E+13					
Total	131	4.43633E+15						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	47627942.8	1904490.243	25.00823671	1.61745E-51	43860136.62	51395748.98	43860136.62	51395748.98
X Variable 1	207735.8869	105560.8679	1.967925151	0.051205101	-1103.665745	416575.4396	-1103.665745	416575.4396

Figure B.13: Statistical Results Total kWh versus ambient temperature

The statistical interpretation of the above figures is illustrated in the following graphs for the below table analysis

Analysis Criteria (Energy – kWh)	R ²	Linearity	Independence	Normality	Equal Variance
1. Total vs TH	0.014	1	1	1	1
2. Variable Total vs TH	0.019	1	1	1	1
3. Fans vs. TH	0.008	1	1	1	1
4. Variable Fans vs TH	0.009	1	1	1	1
5. Total Refrigeration vs. TH	0.018	1	1	1	1
6. Variable Refrigeration vs TH	0.003	1	1	1	1
7. Total Pumping vs TH	0.084	1	1	1	1
8. Variable Pumping vs TH	0.11	1	1	1	1
9. Total Compressed Air vs TH	0.022	1	1	1	1
10. Variable Compressed Air vs TH	0.252	1	1	1	1
11. Total Mining vs TH	0.062	1	1	1	1
12. Variable Mining vs TH	0.351	1	1	1	1
13. Total Winders	0.045	1	1	1	1
14. Variable Winders vs TH	0.22	1	1	1	1

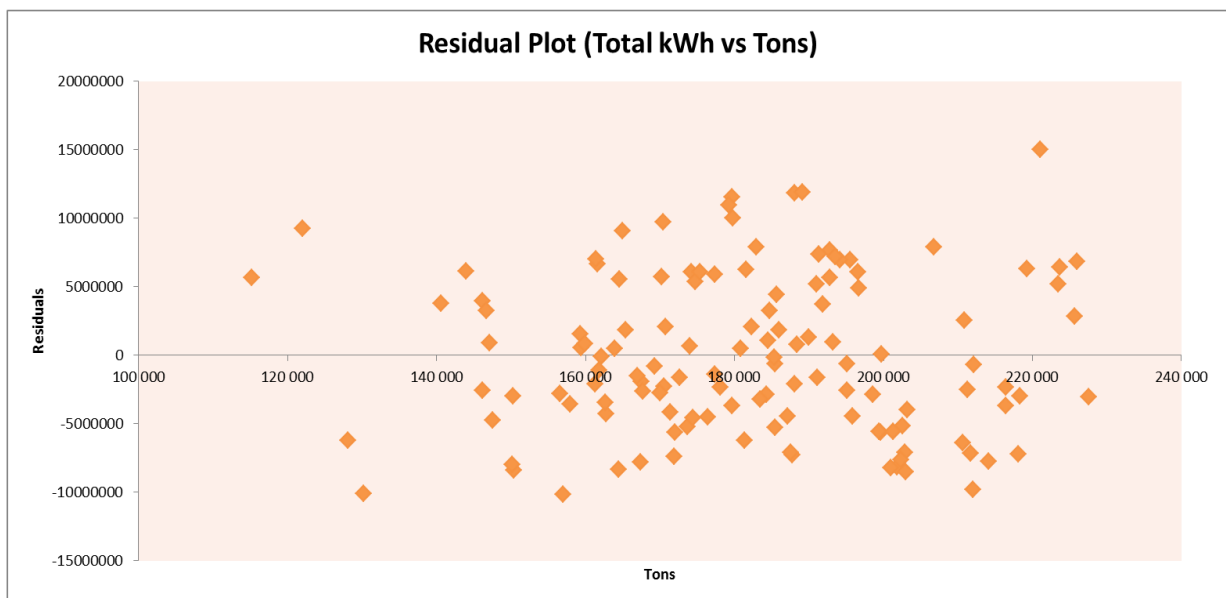
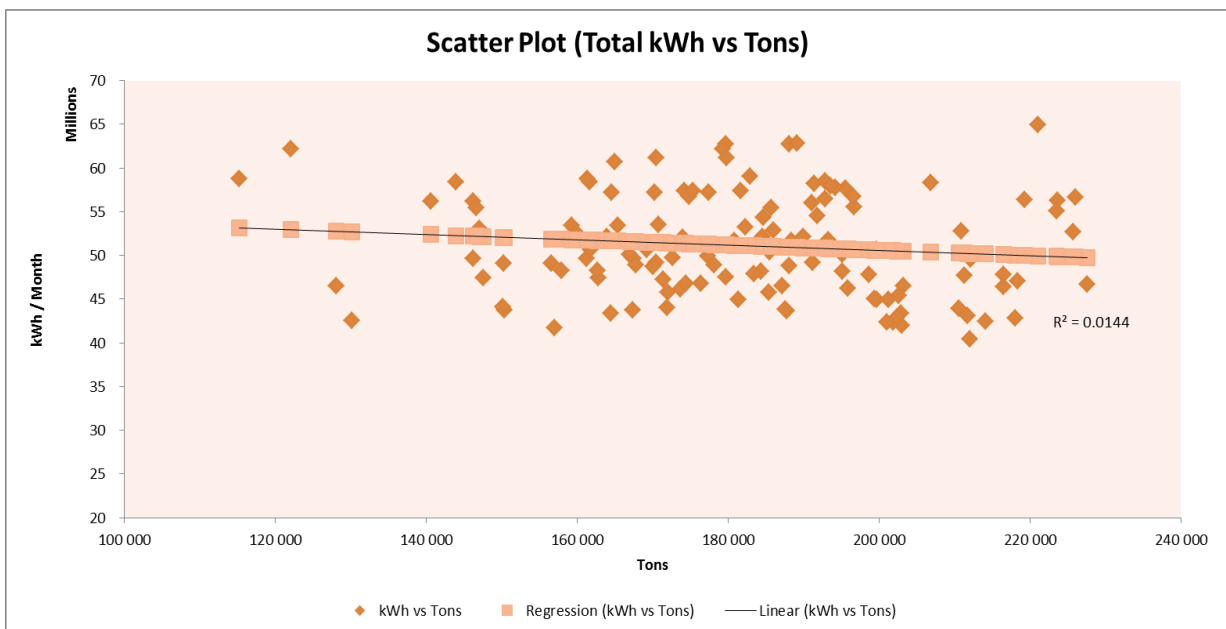
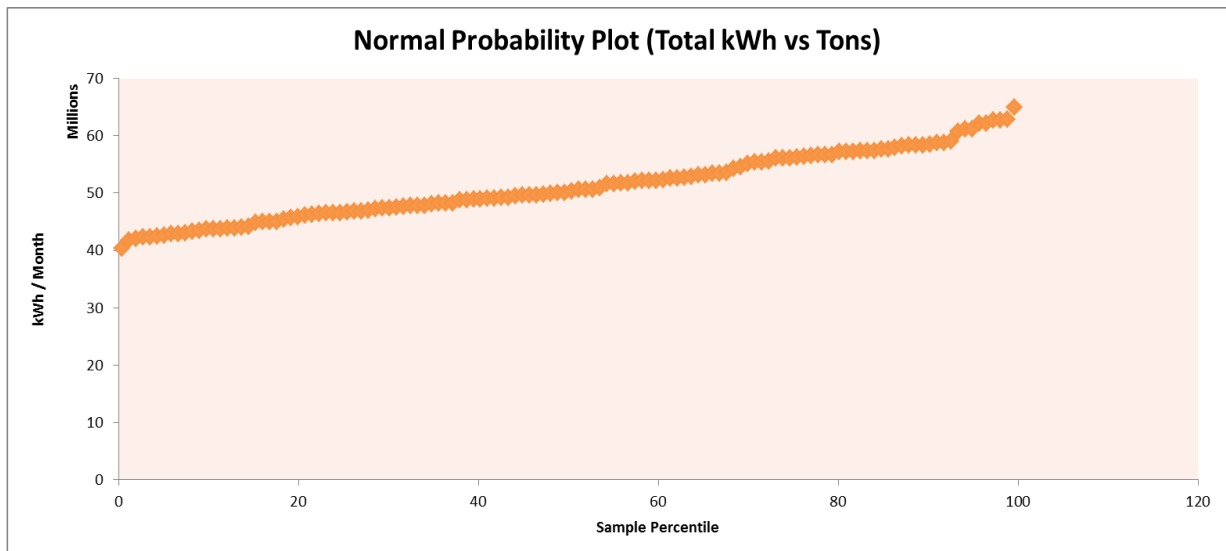


Figure B.14: Normal probability, scatter and residual plot of total kWh versus tons

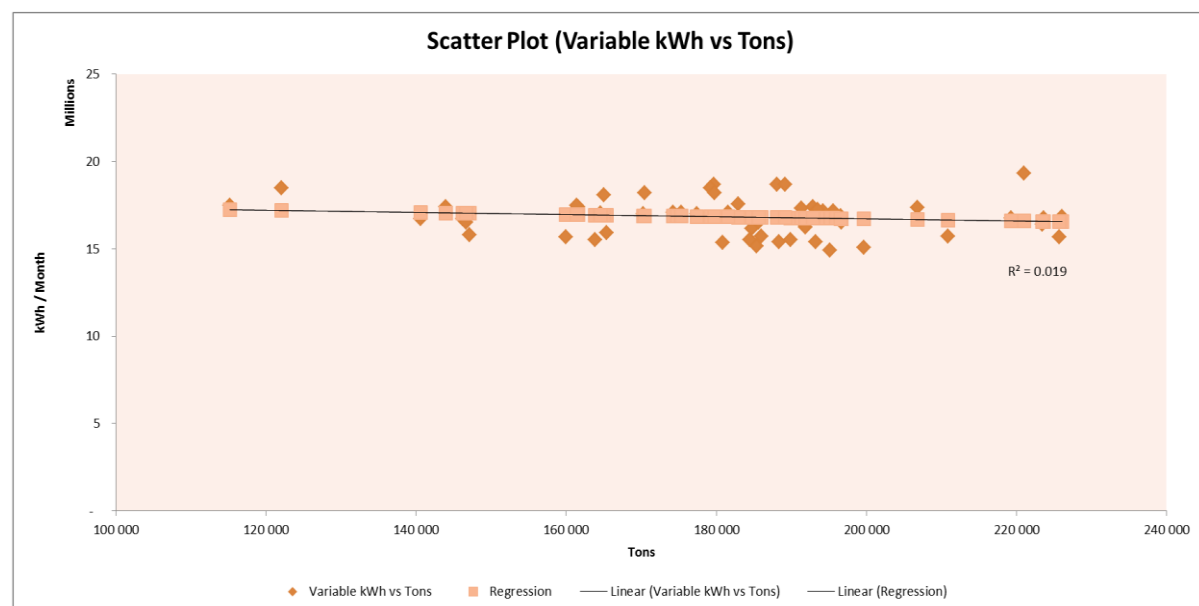
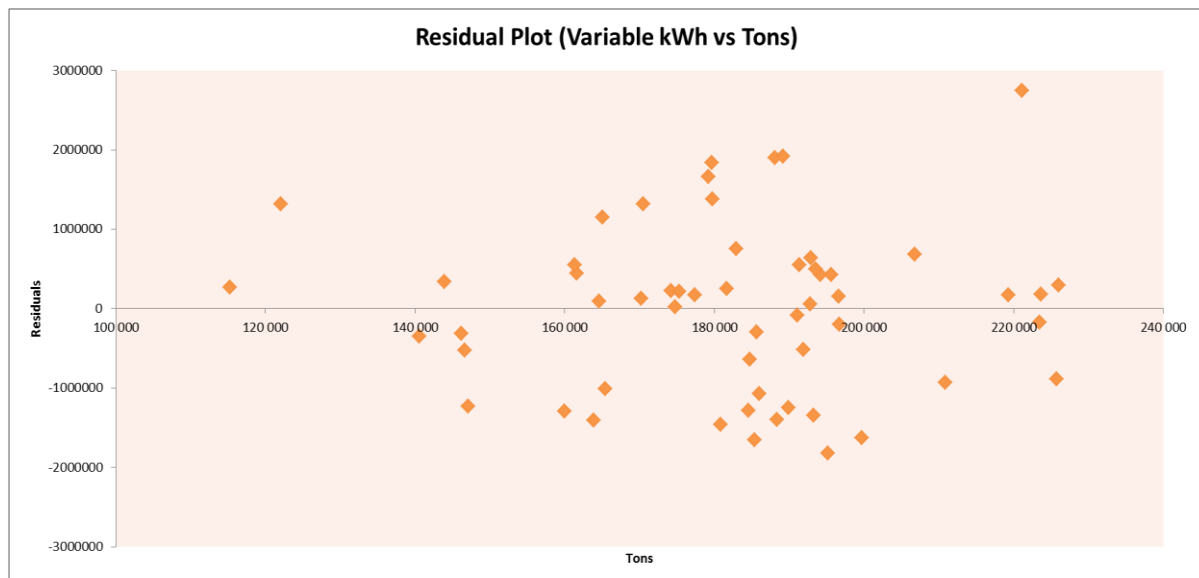
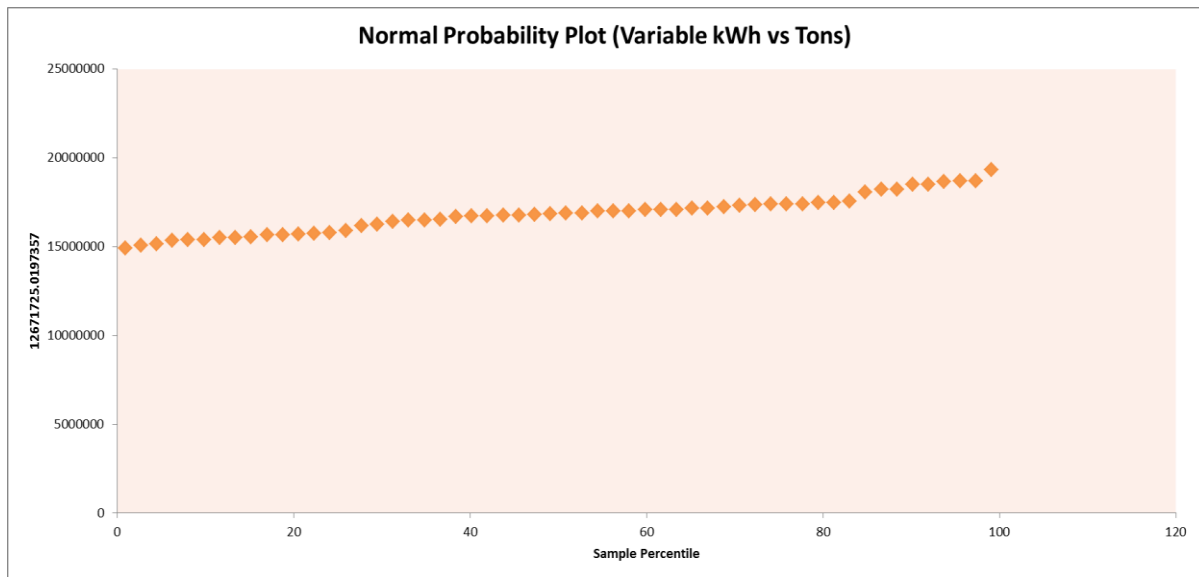


Figure B.15: Normal probability, scatter and residual plot of total variable kWh versus tons

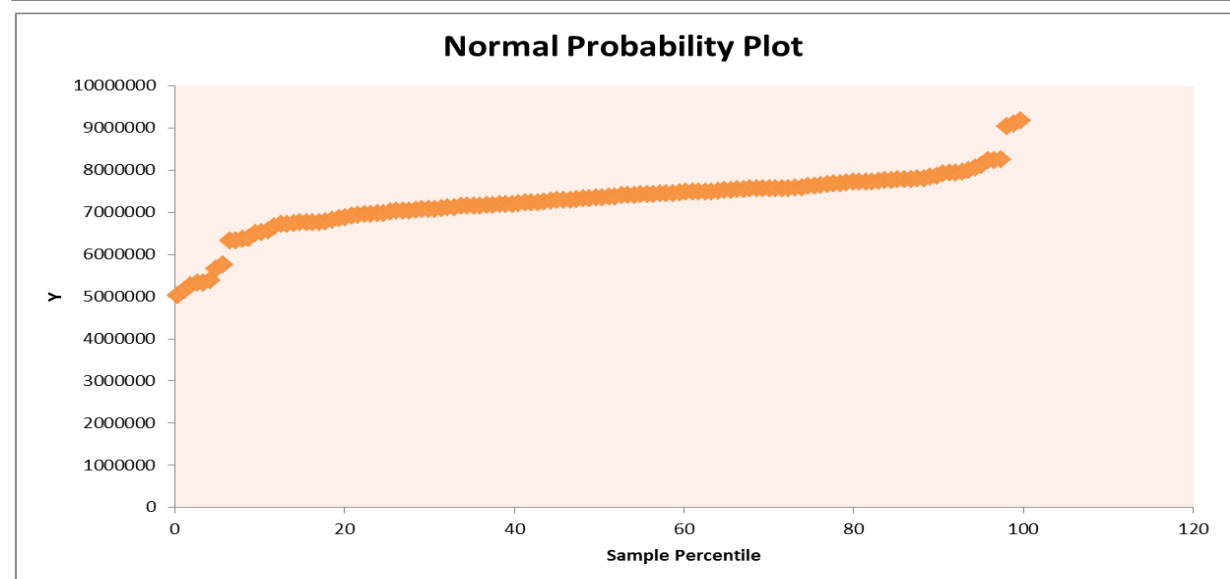
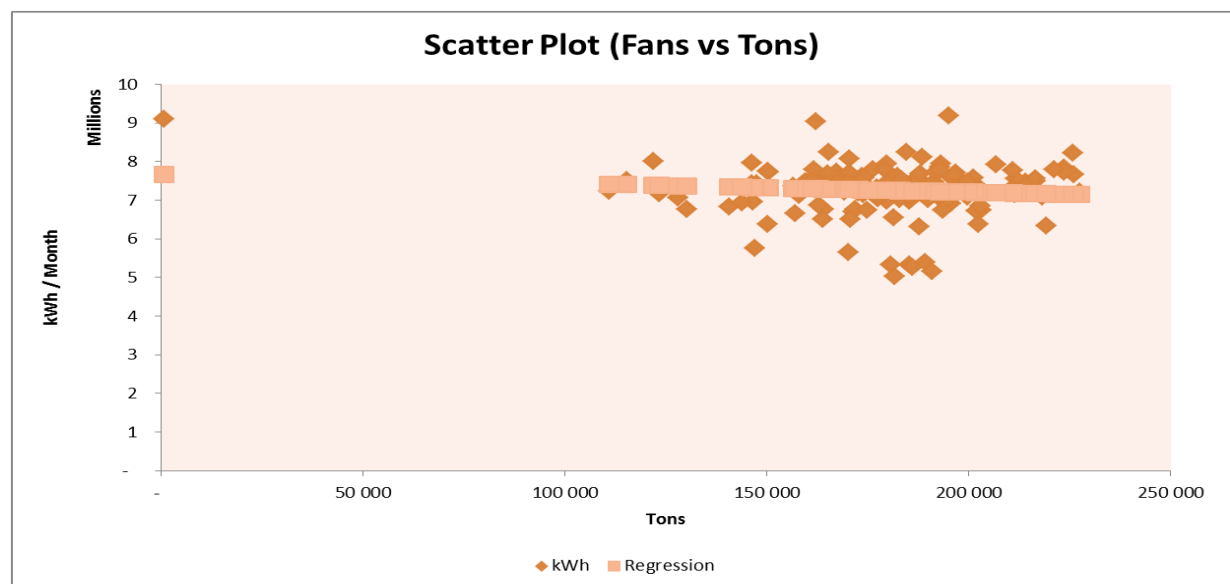
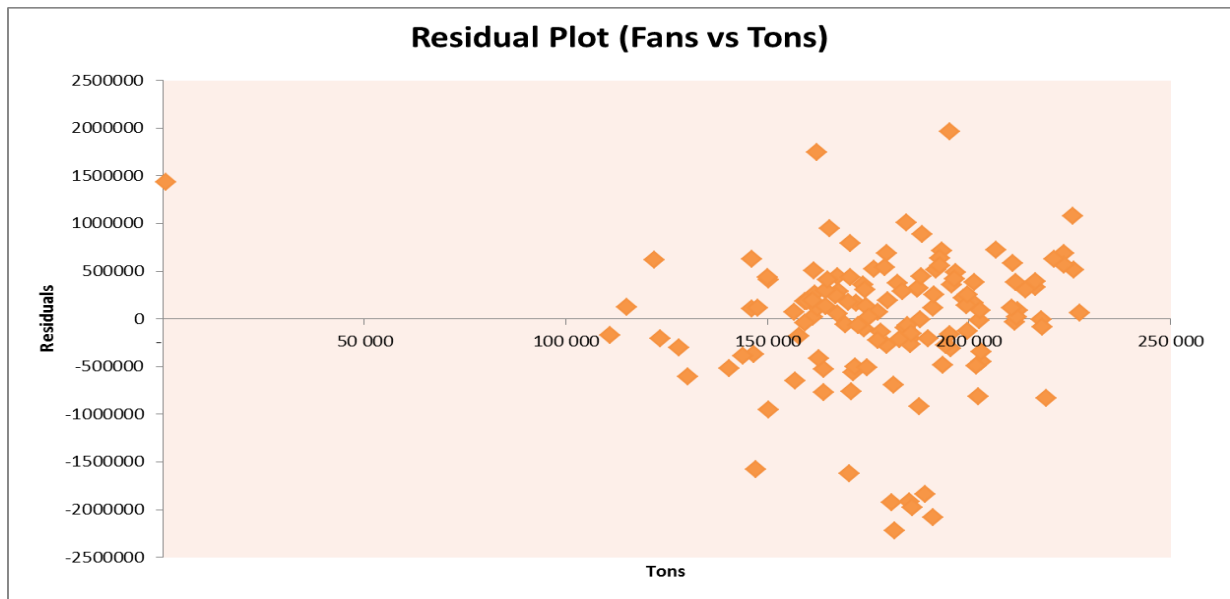


Figure B.16: Normal probability, scatter and residual plot of fans kWh versus tons

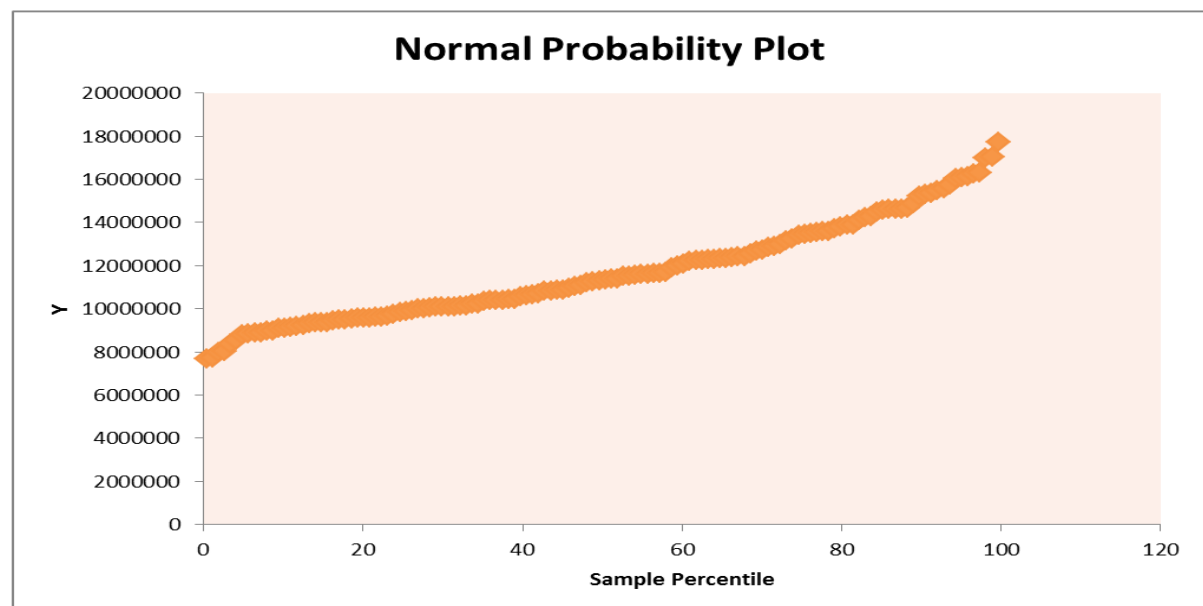
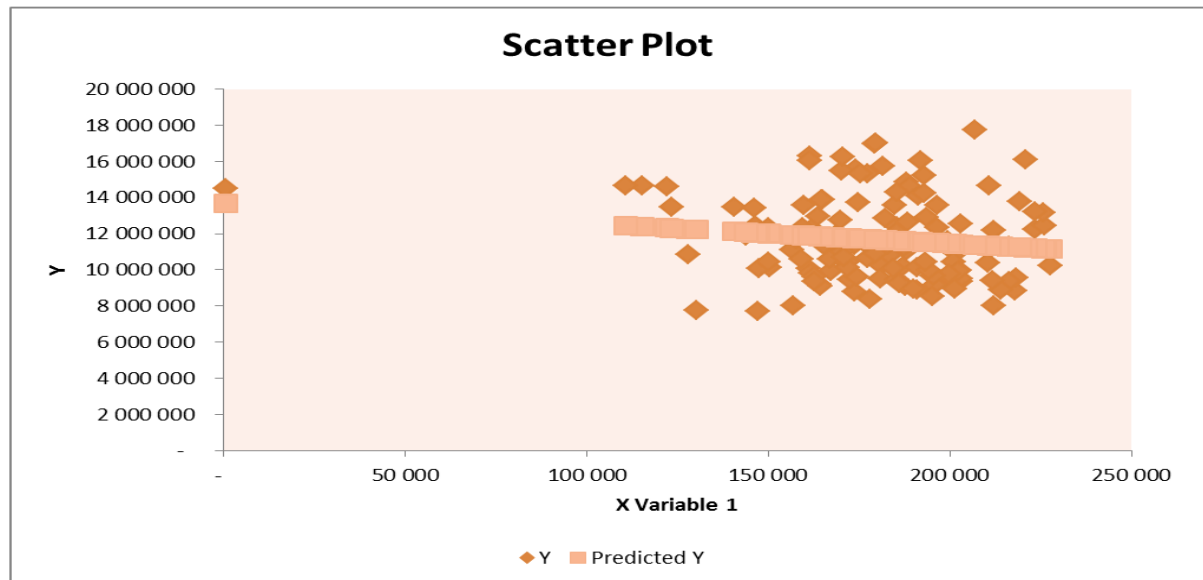
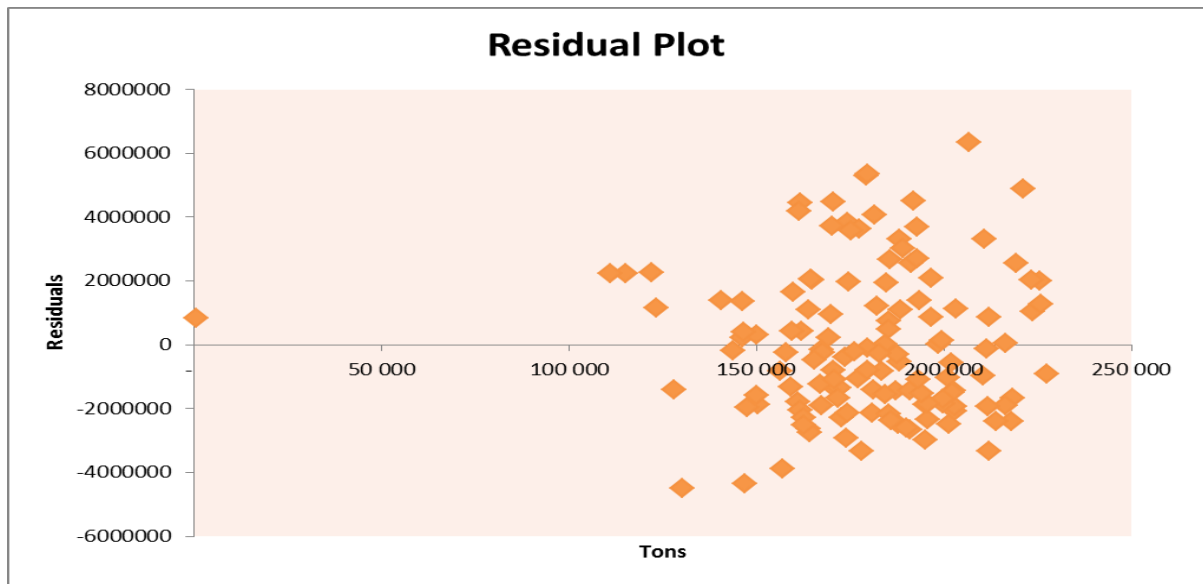


Figure B.17: Normal probability, scatter and residual plot of refrigeration kWh versus tons

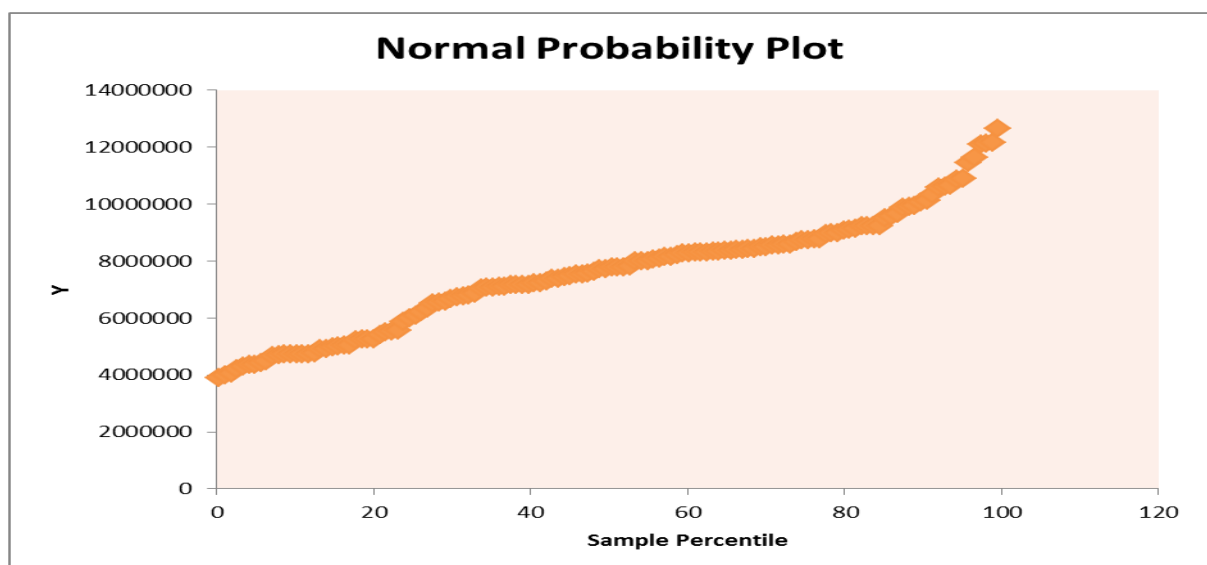
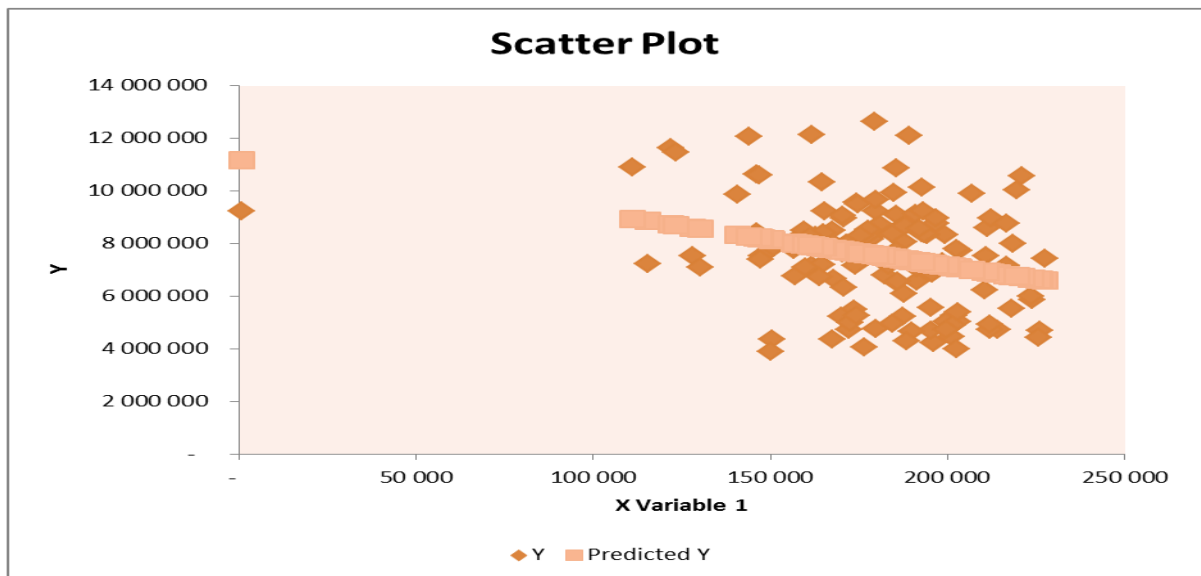


Figure B.18: Normal probability, scatter and residual plot of pumping kWh versus tons

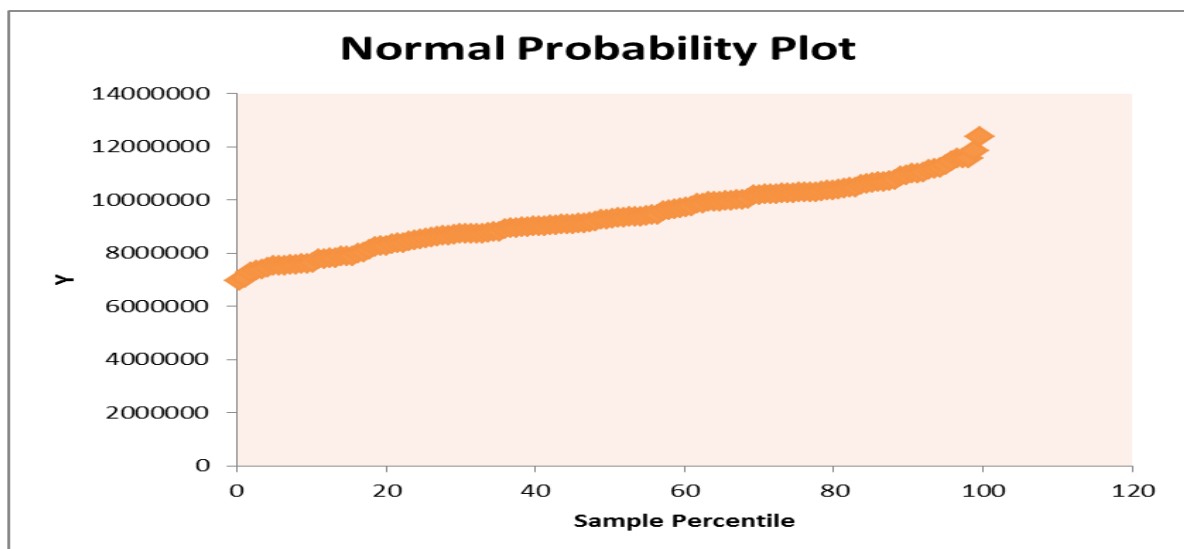
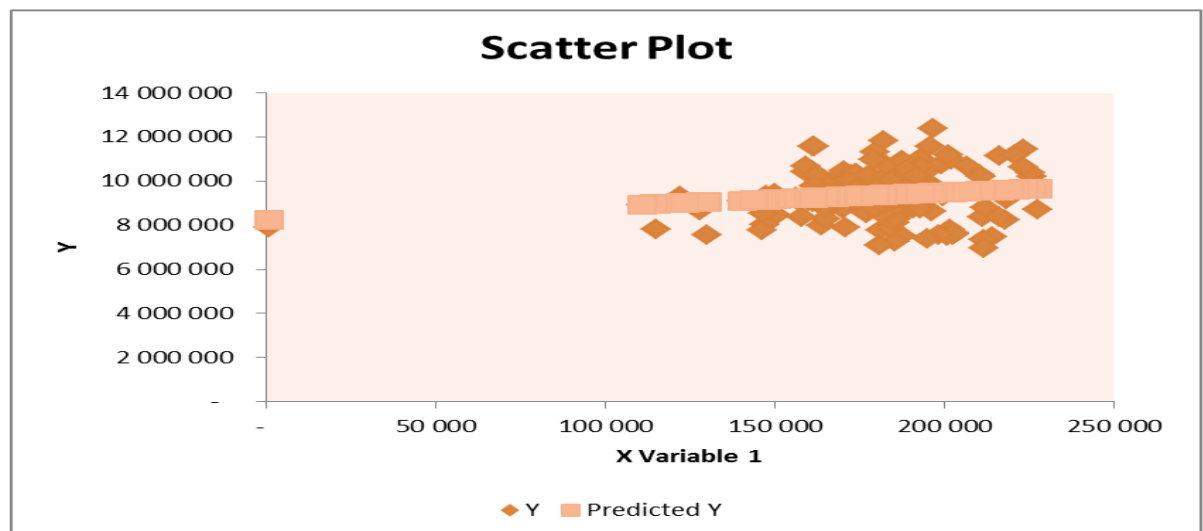
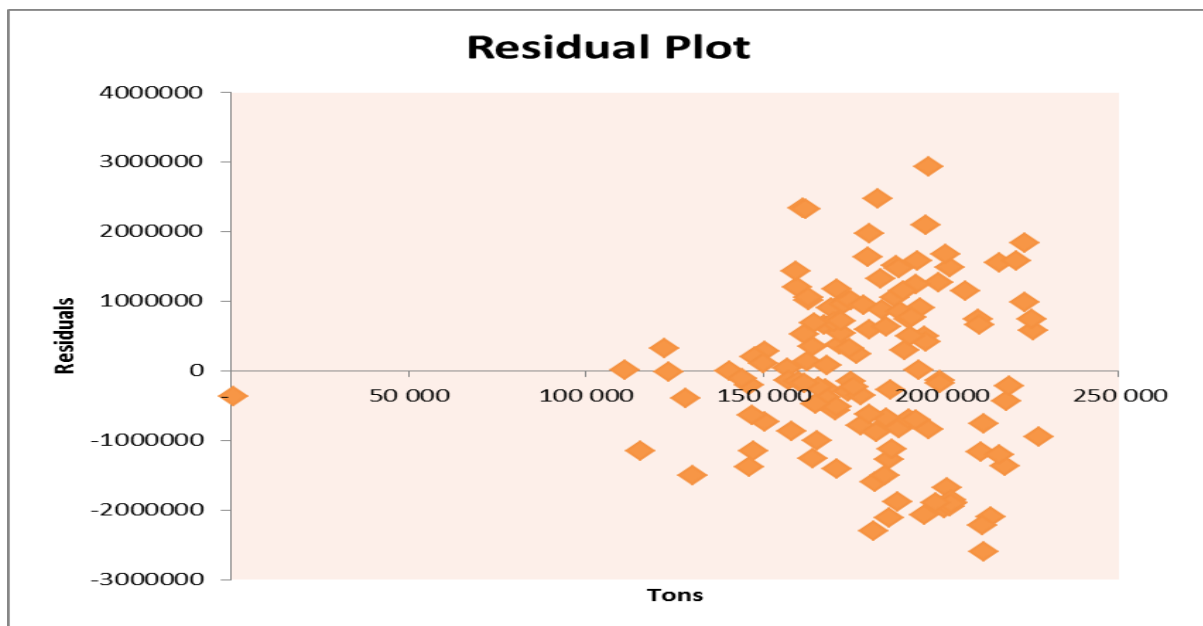


Figure B.19: Normal probability, scatter and residual plot of compressors kWh versus tons

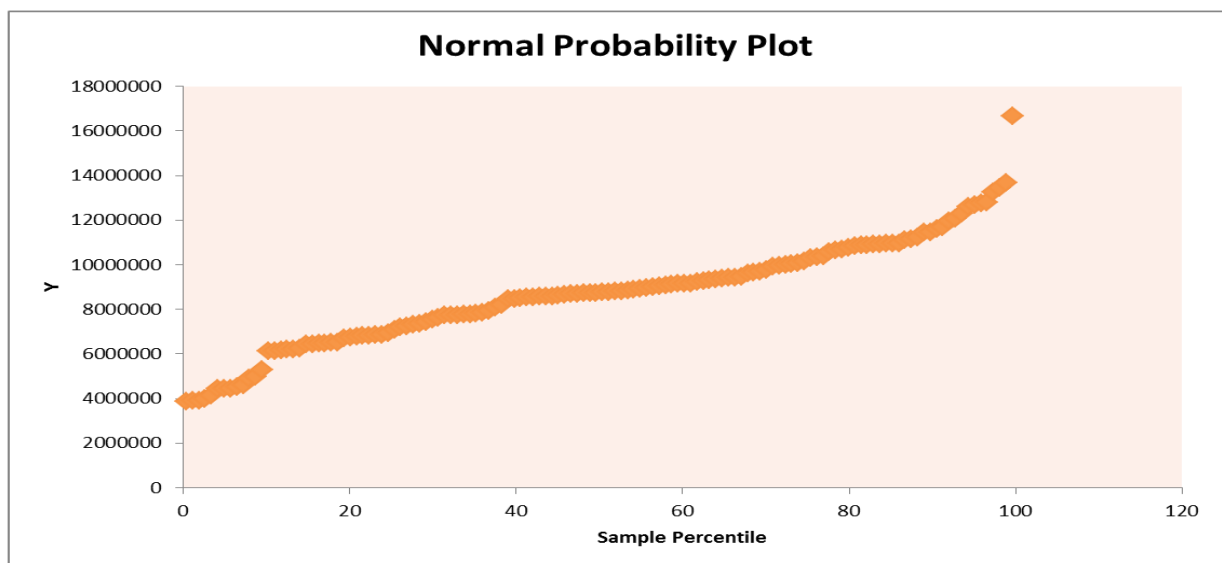
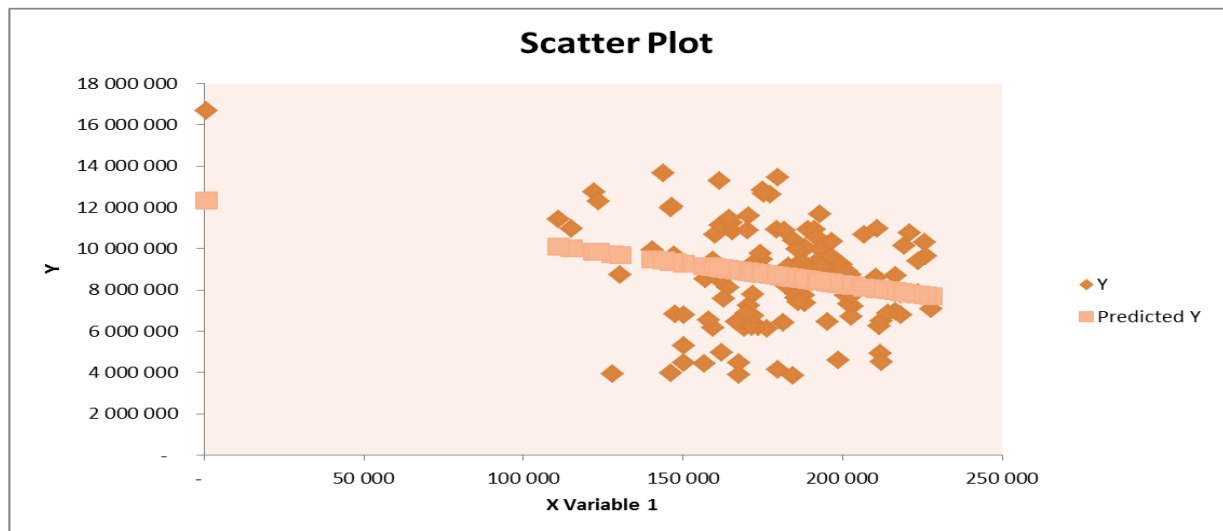
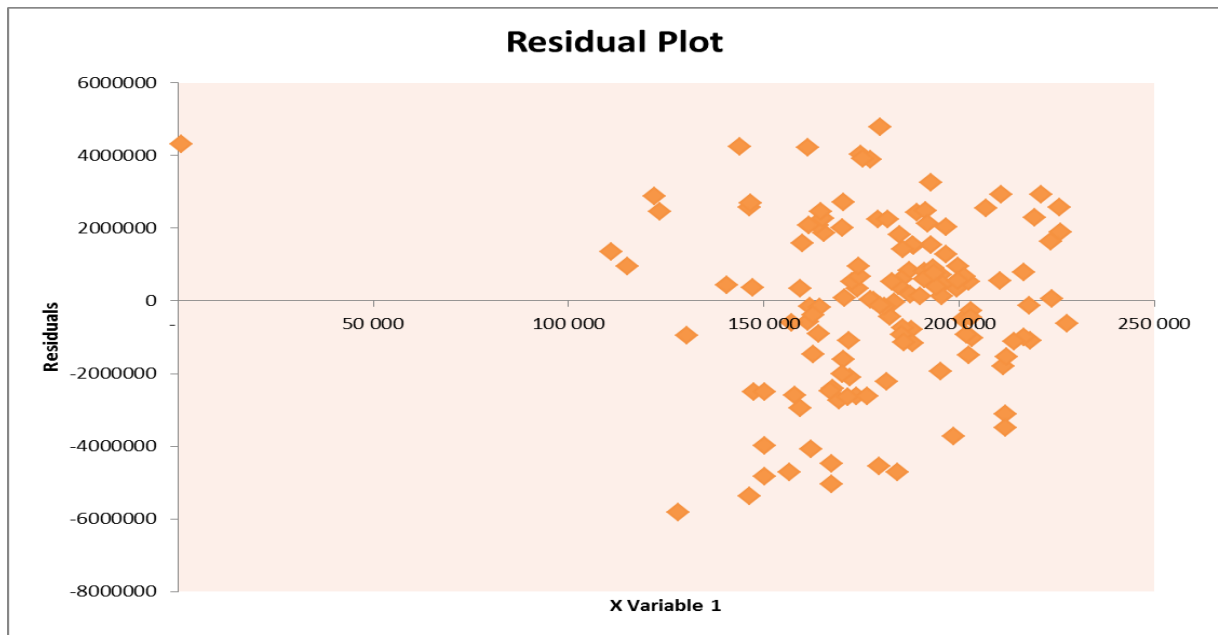


Figure B.20: Normal probability, scatter and residual plot of mining kWh versus tons

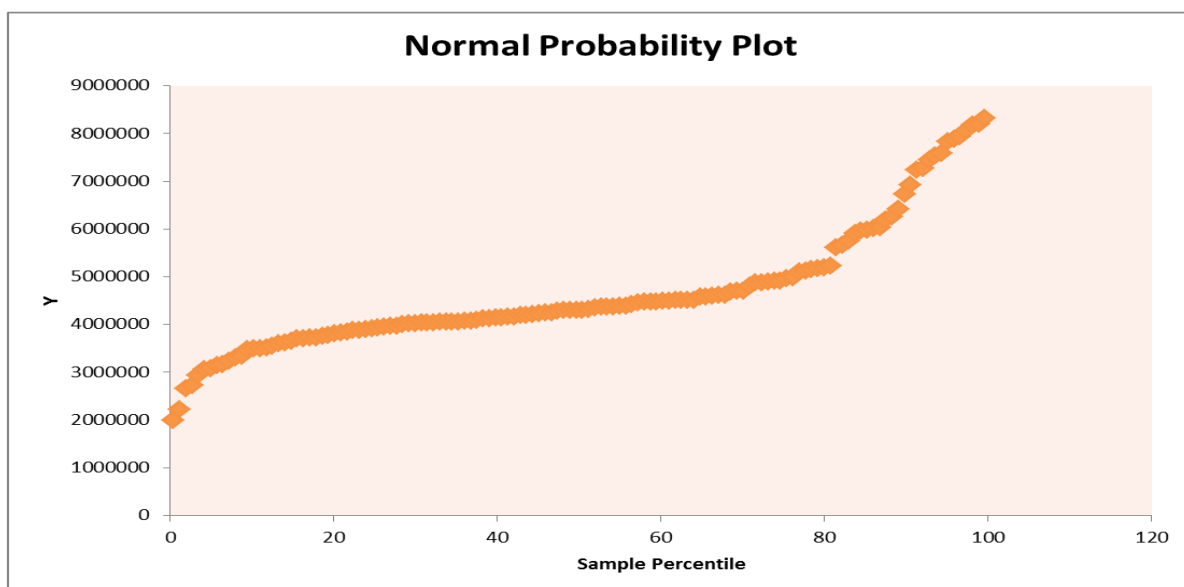
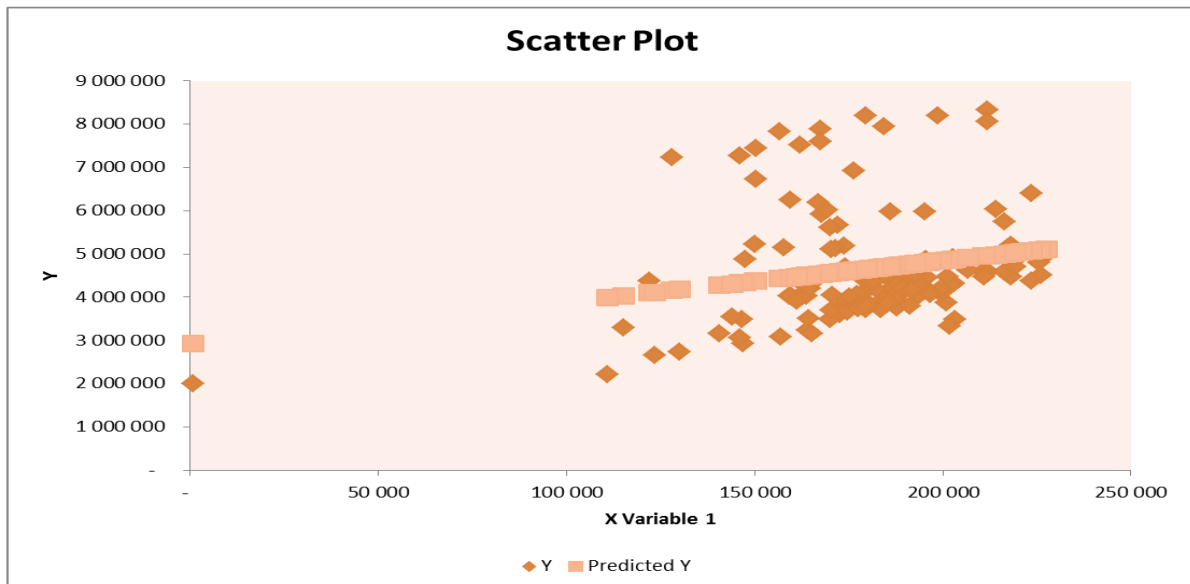
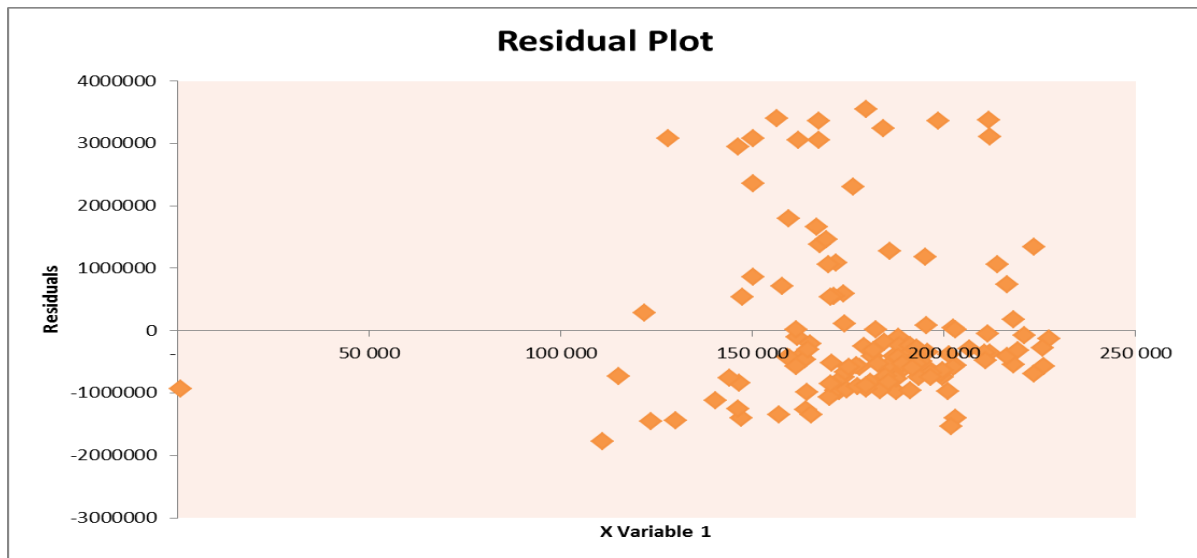


Figure B.21: Normal probability, scatter and residual plot of mining kWh versus tons

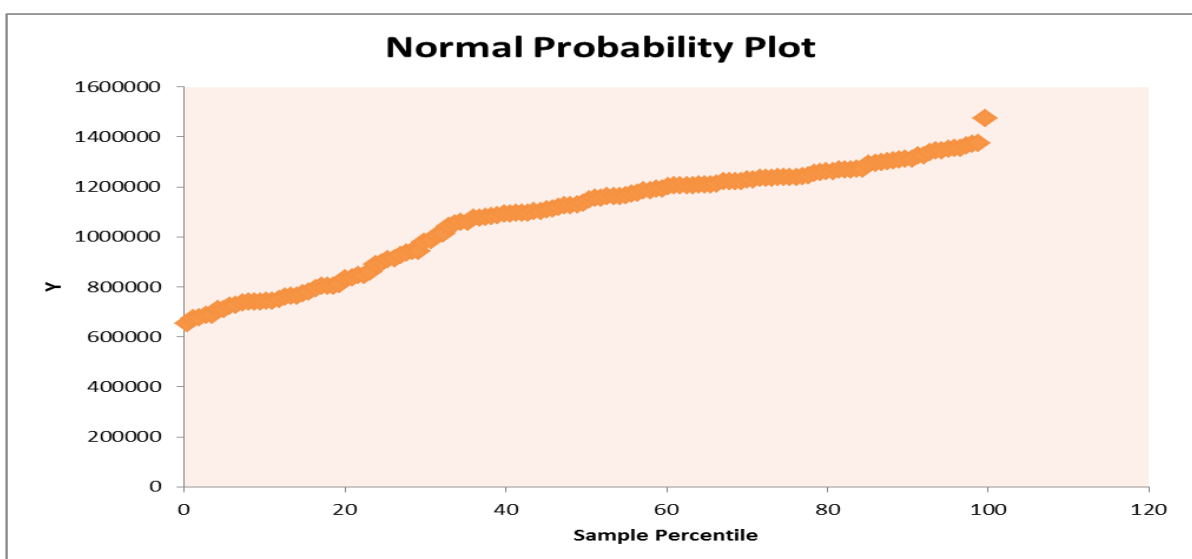
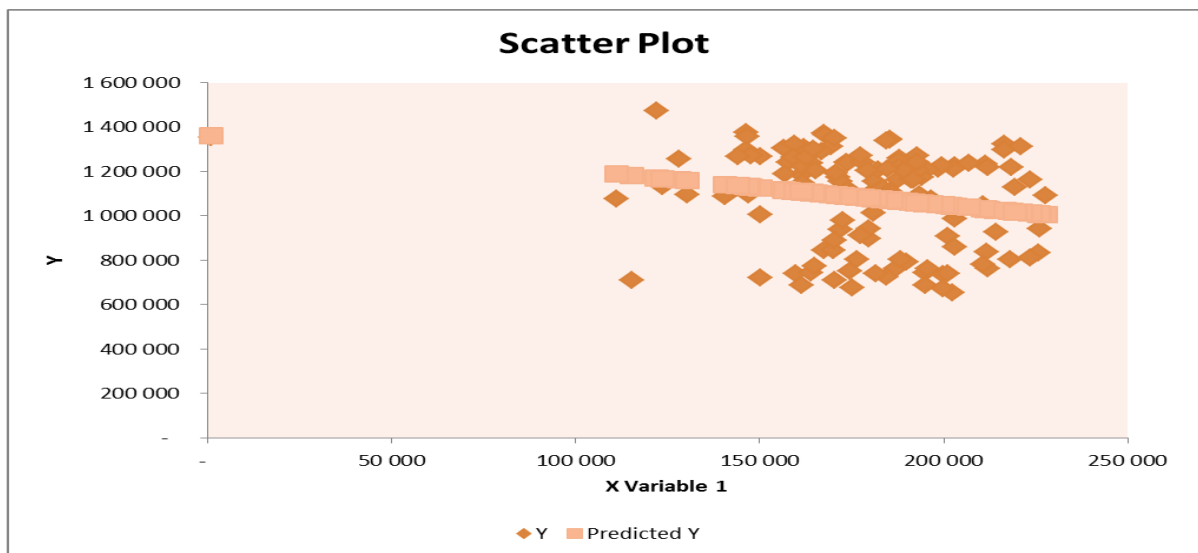
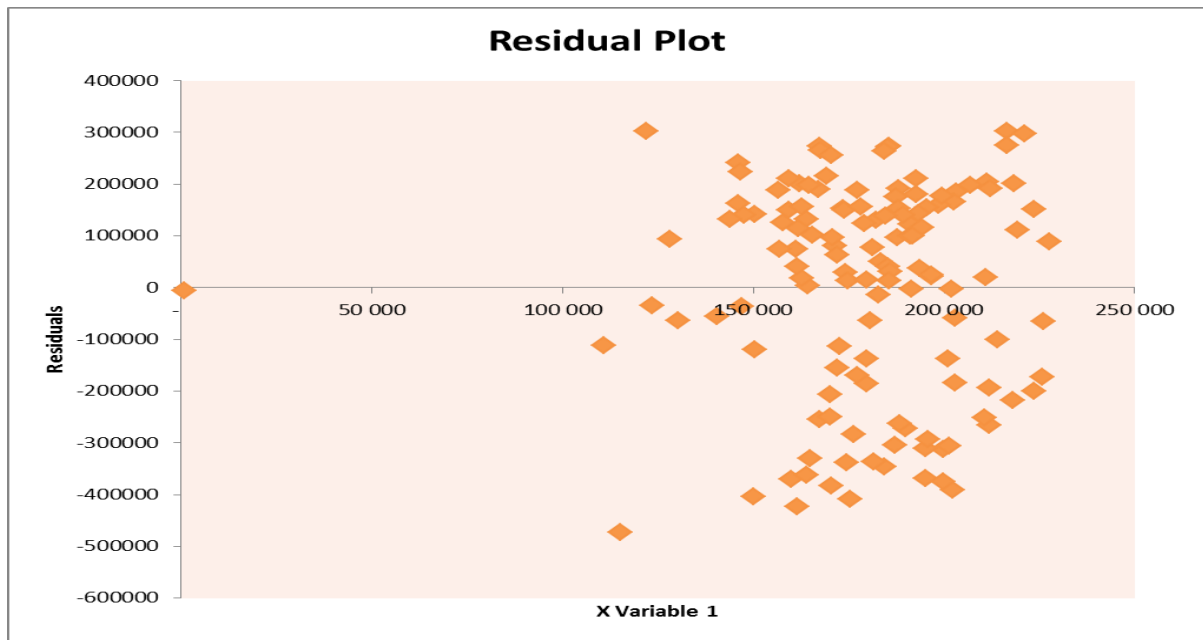


Figure B.22: Normal probability, scatter and residual plot of winders kWh versus tons

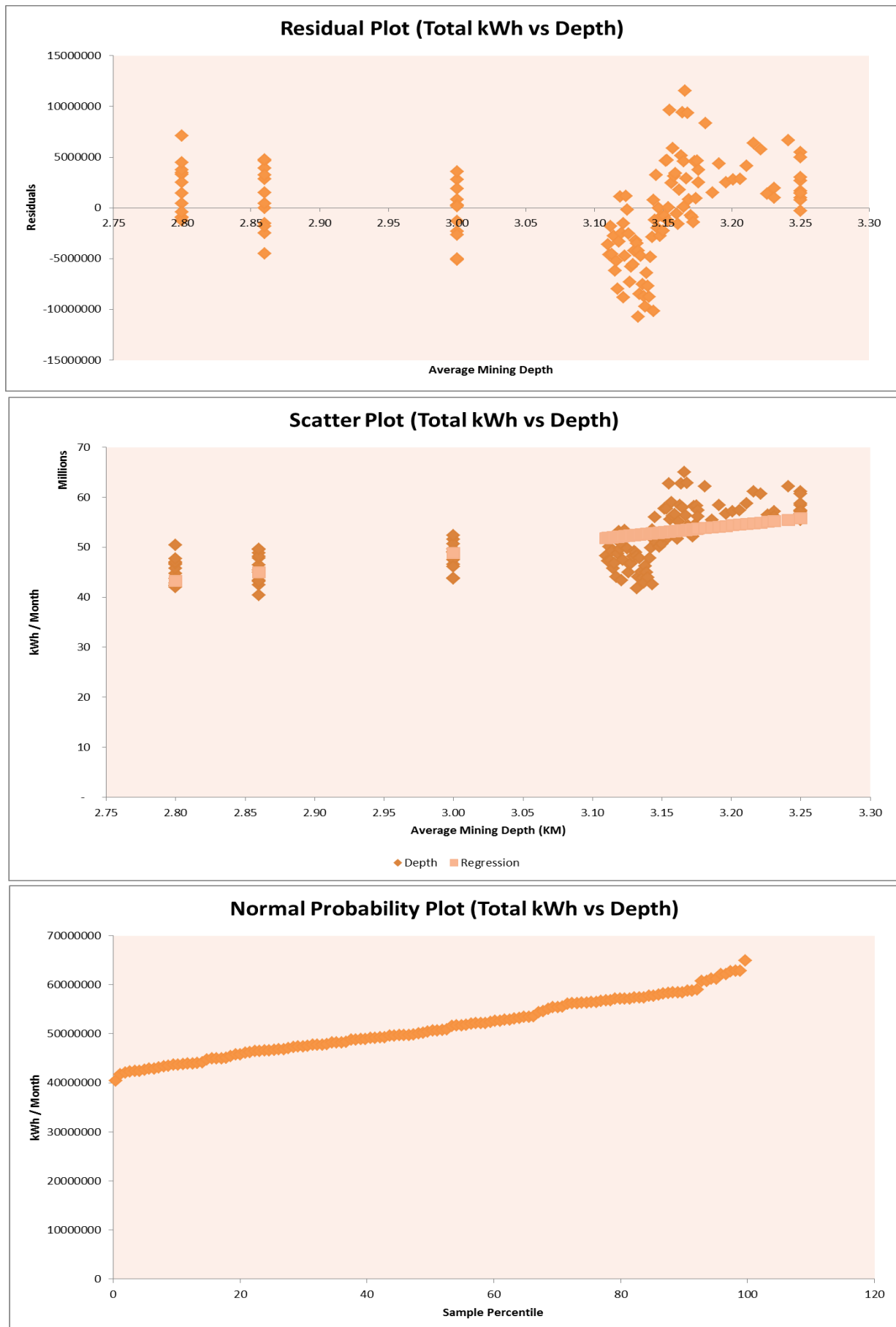


Figure B.23: Normal probability, scatter and residual plot of total kWh versus depth

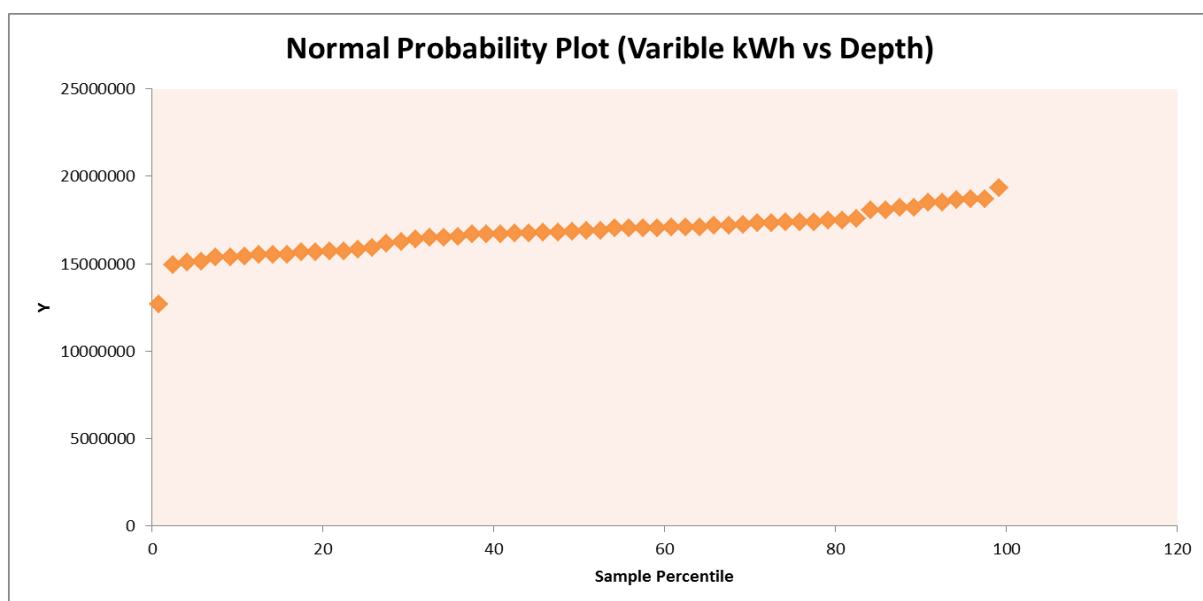
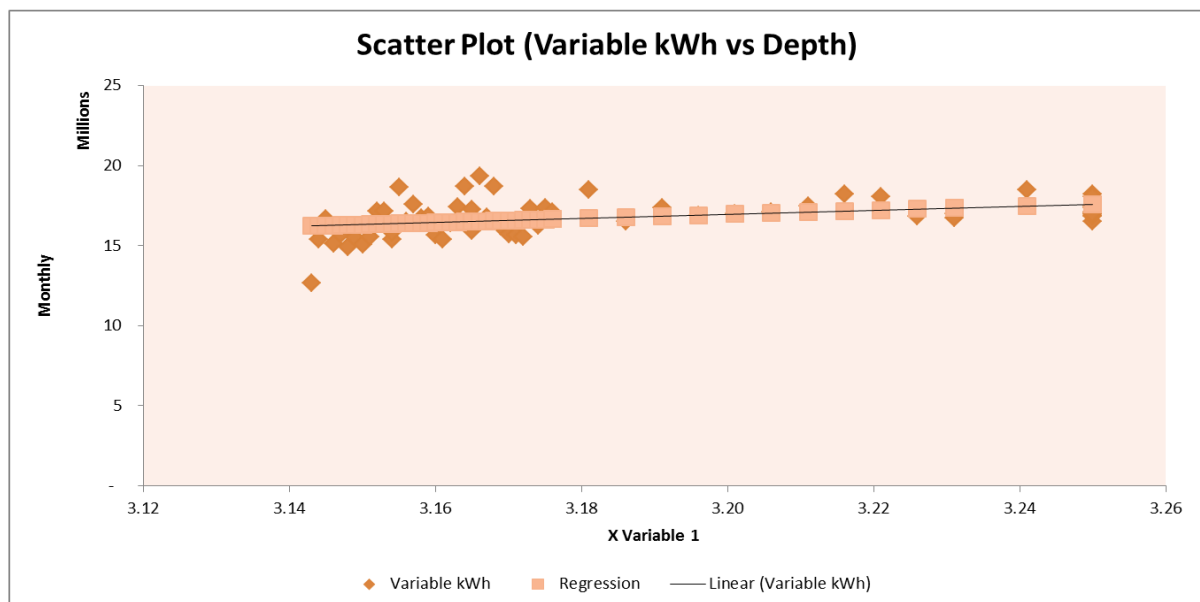
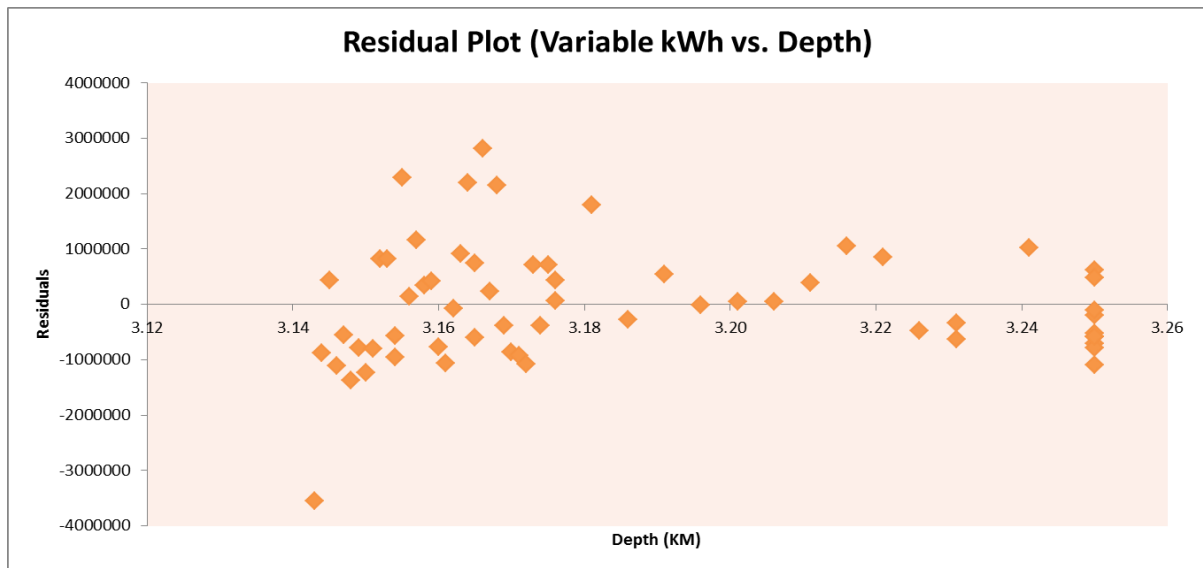


Figure B.24: Normal probability, scatter and residual plot of total variable kWh versus depth

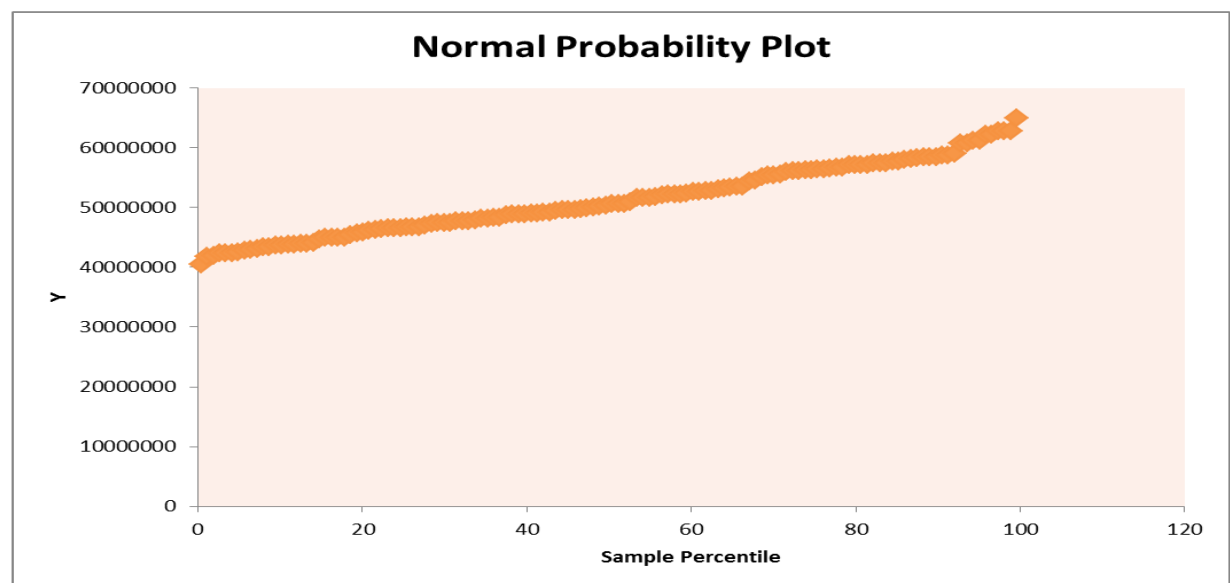
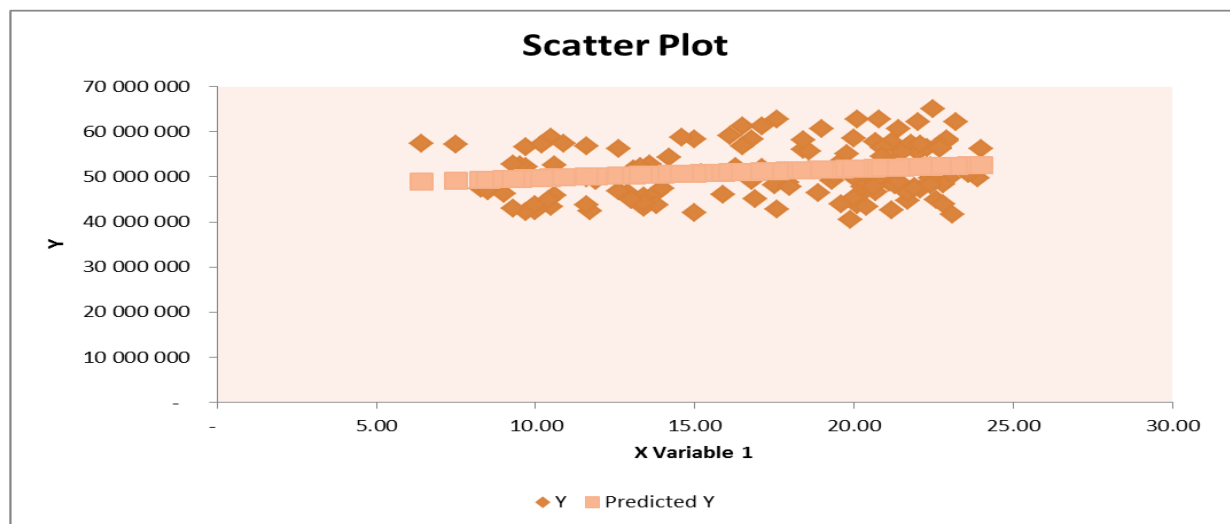
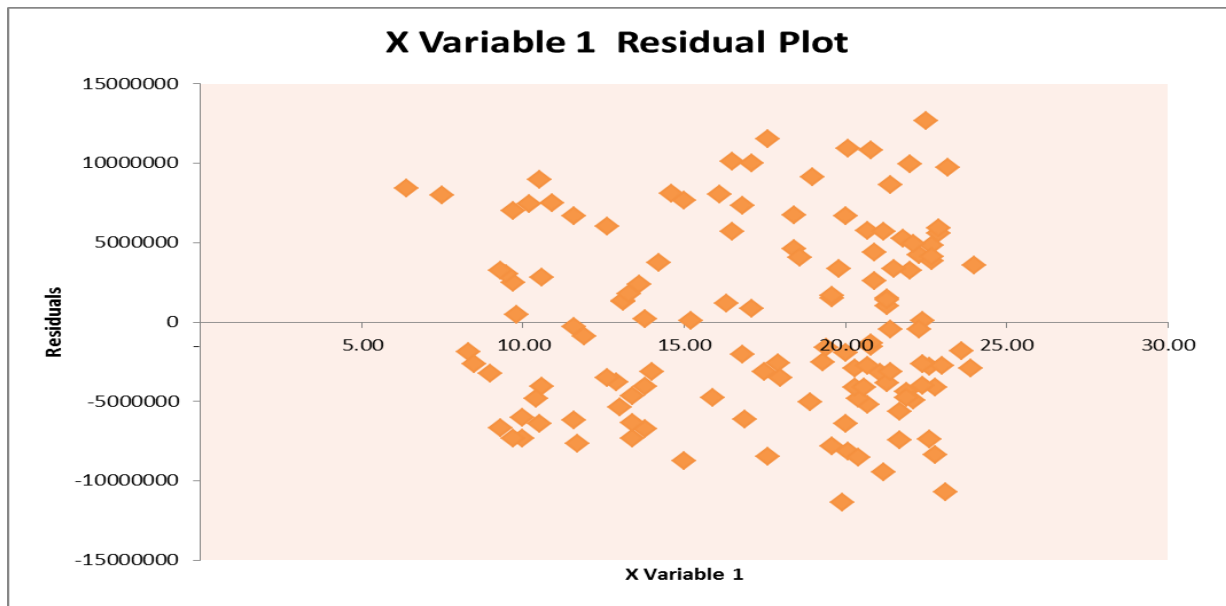


Figure B.25: Normal probability, scatter and residual plot of total variable kWh versus ambient temperature

Appendix C – Regression Forecast

1. Statistical Consultation Services – North West University in collaboration with Prof Faans Steyn (Steyn, 2013b)

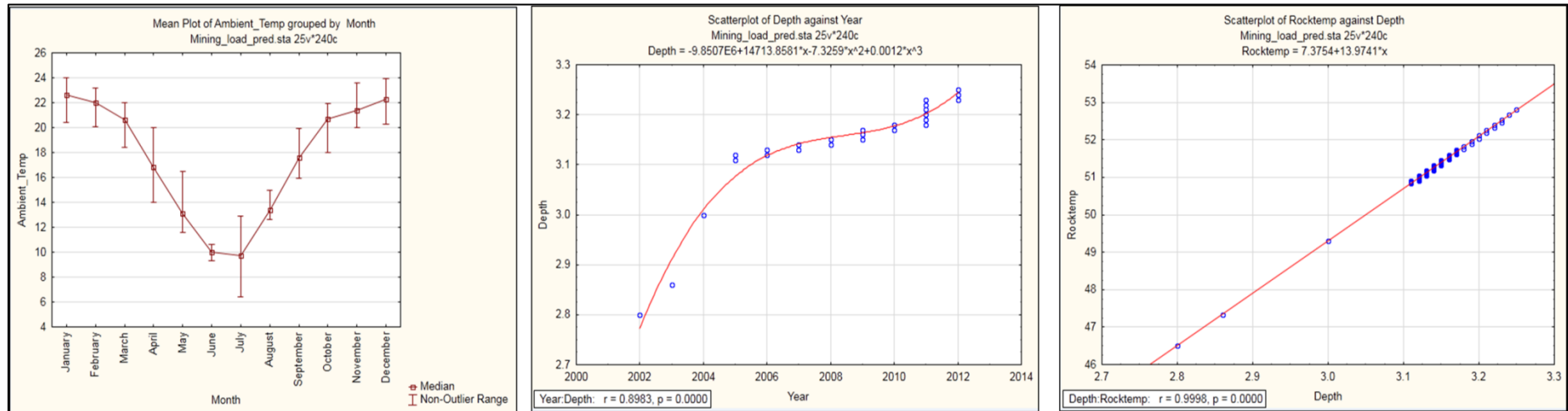


Figure C.1: Variable and dependable analysis

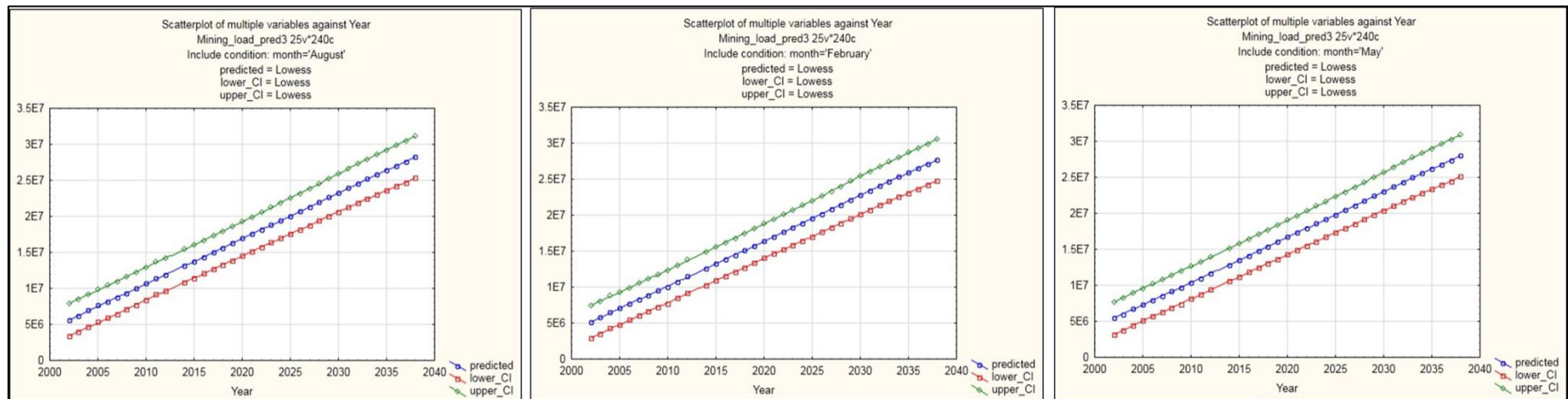


Figure C.2: Mining (kWh) regression forecast over years

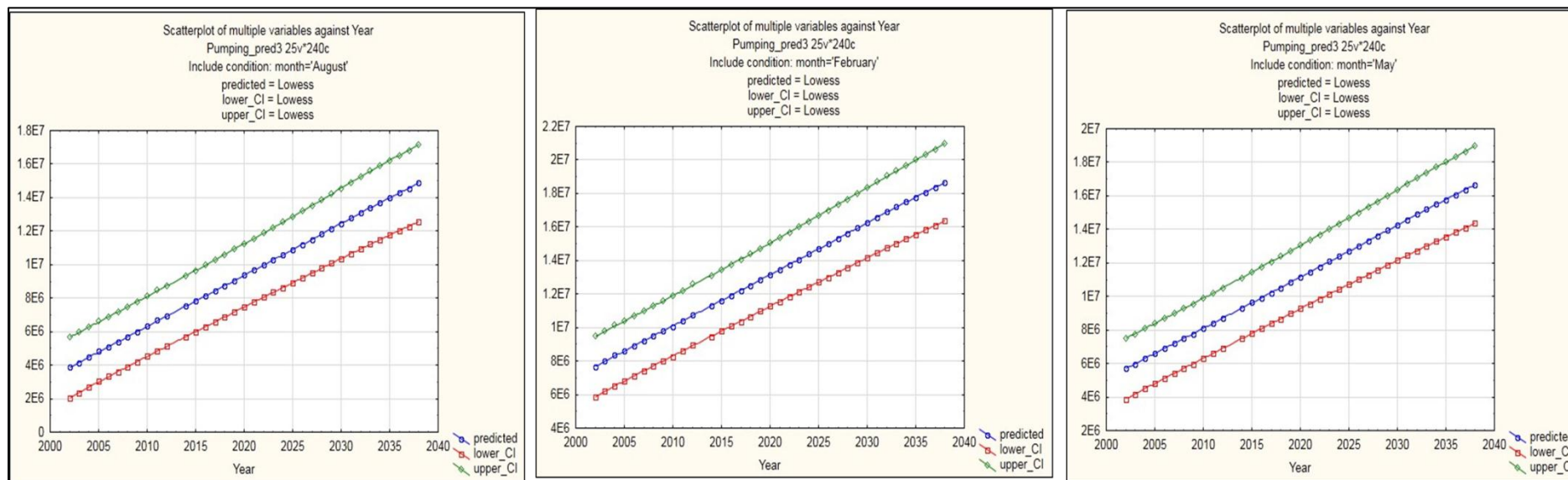


Figure C.3: Pumping (kWh) regression forecast over years

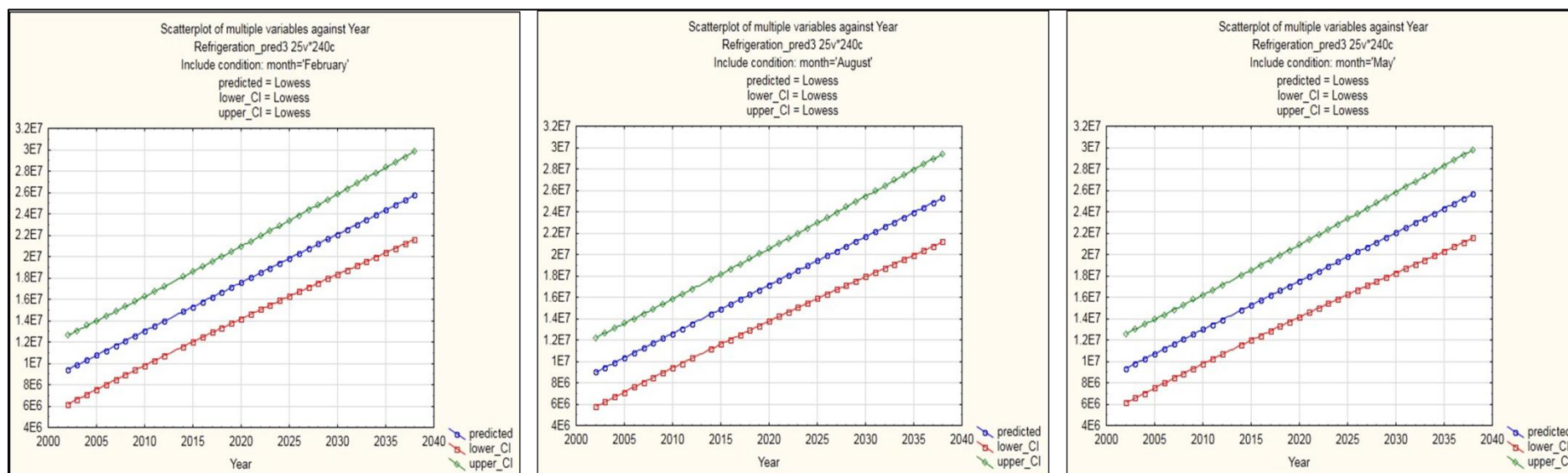


Figure C.4: Refrigeration (kWh) regression forecast over years

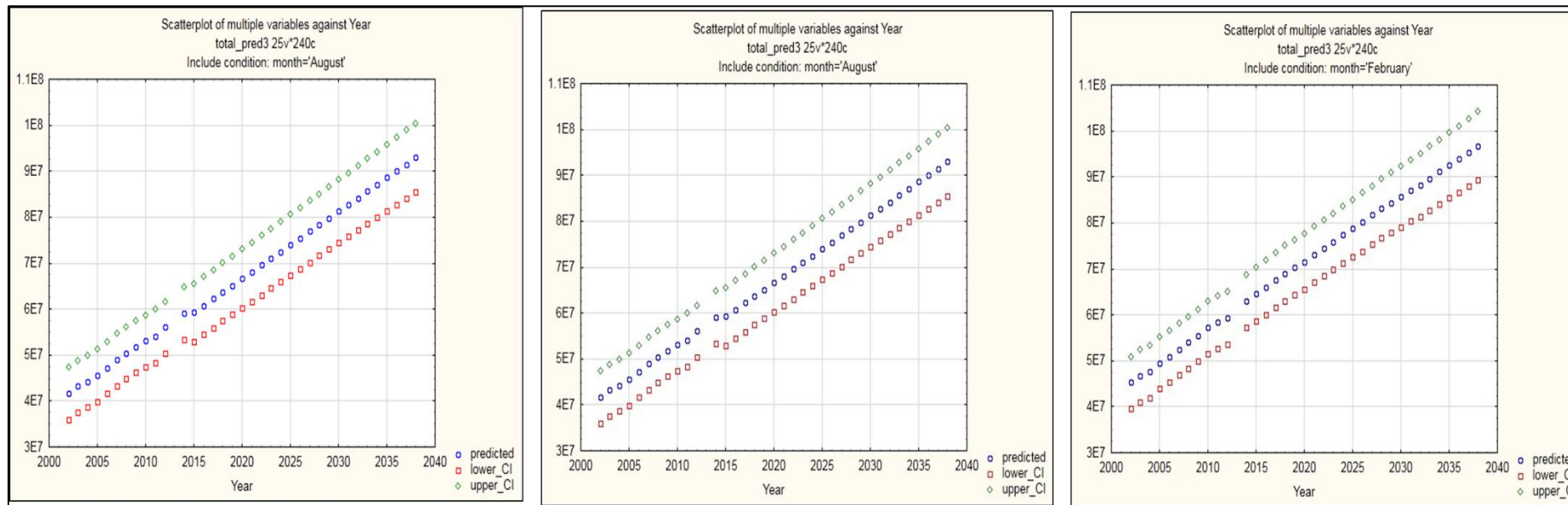
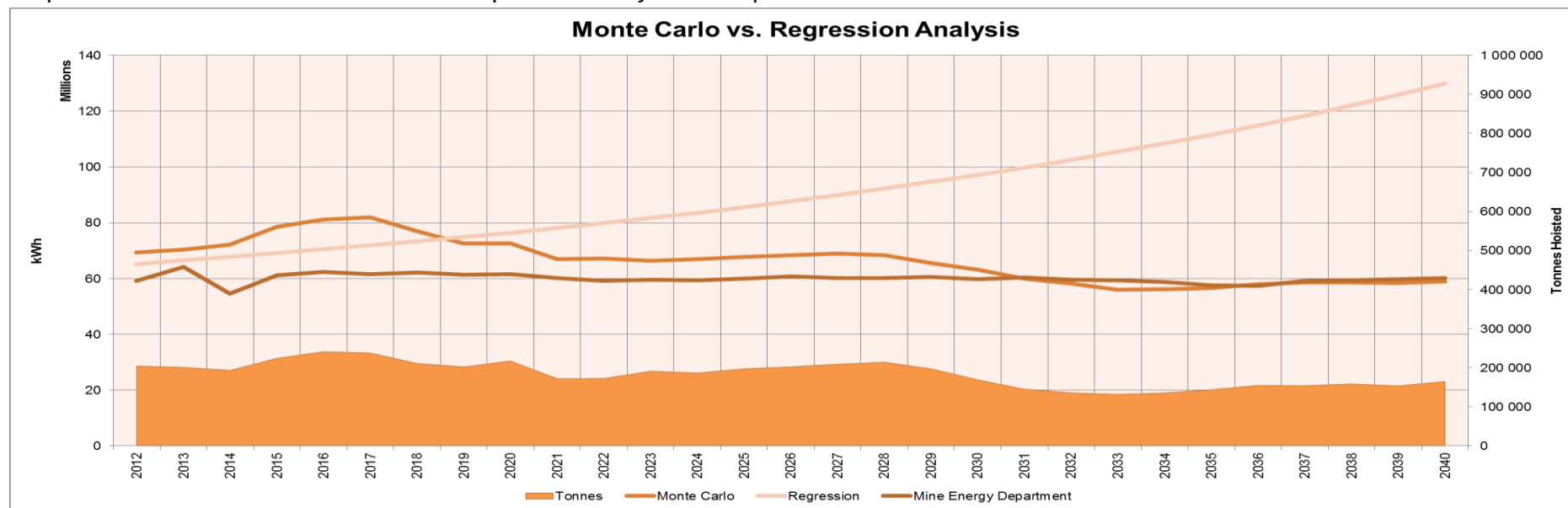


Figure C.5: Total kWh regression forecast over years

2. Model Comparison for NPV calculation

Step 1: Use forecasted model data and compare over 28 year LOM profile



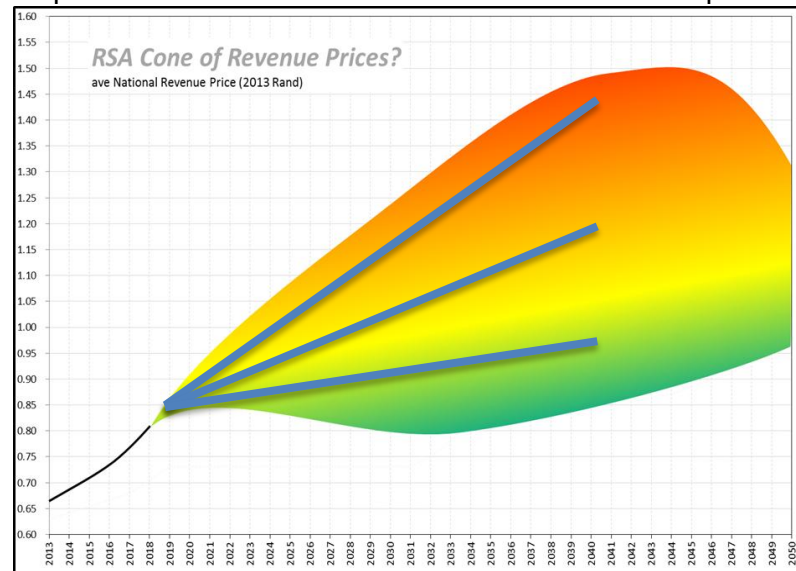
Step 2: Calculate historical monthly energy consumption percentages

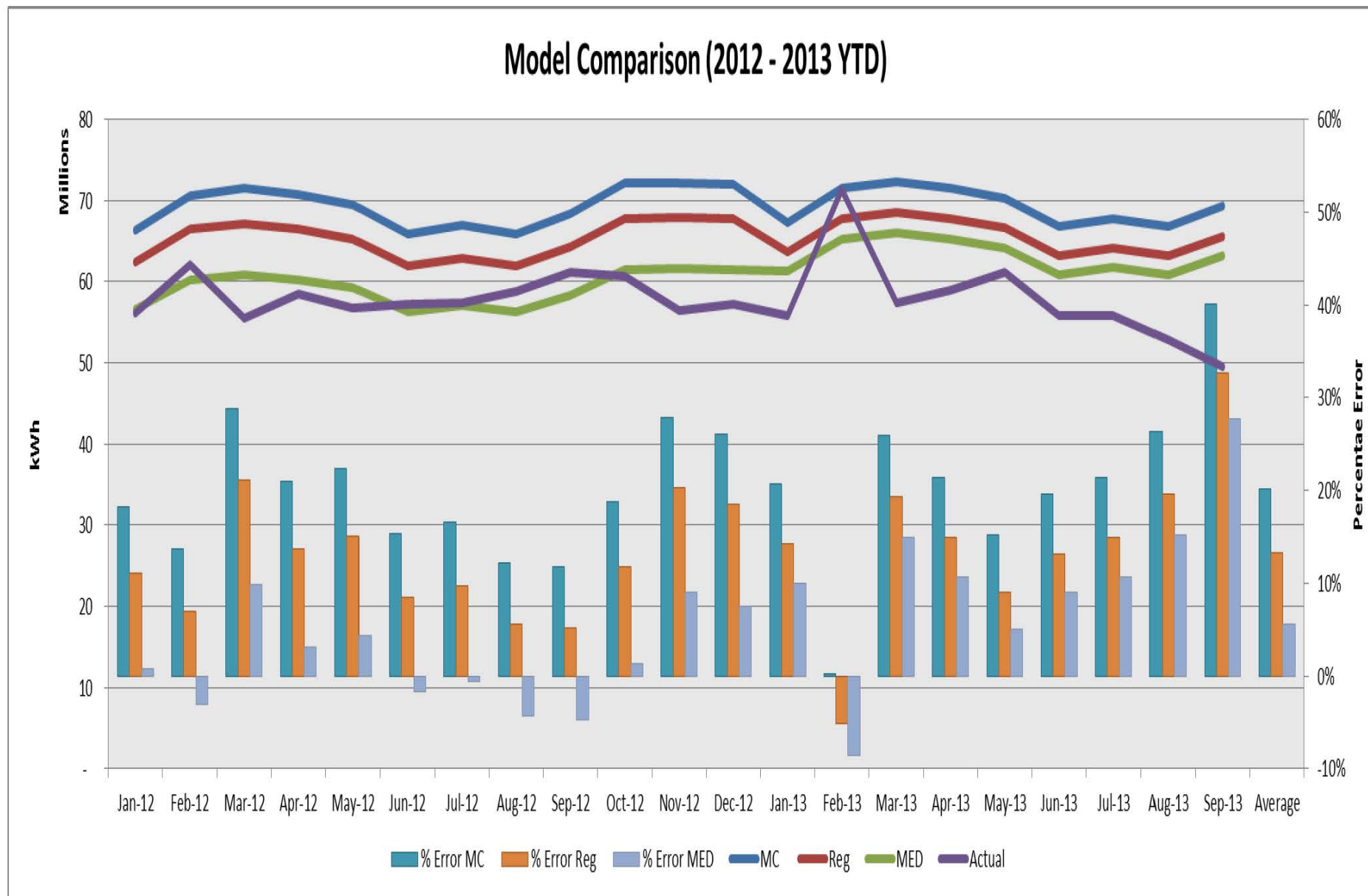
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Average
Jan	8.25%	9.01%	8.57%	8.31%	7.49%	7.56%	6.80%	7.79%	7.89%	8.05%	8.05%	7.98%
Feb	8.06%	8.17%	8.03%	8.14%	8.20%	7.98%	8.24%	9.20%	9.58%	8.91%	8.91%	8.49%
Mar	9.30%	8.88%	8.48%	8.62%	9.22%	8.66%	8.95%	8.15%	8.31%	7.95%	7.95%	8.59%
Apr	8.59%	8.25%	8.48%	8.16%	8.99%	8.16%	8.13%	8.65%	9.26%	8.37%	8.37%	8.49%
May	8.44%	8.44%	8.91%	8.47%	8.60%	7.95%	8.44%	8.25%	8.01%	8.13%	8.13%	8.34%
Jun	7.81%	7.89%	7.55%	7.88%	7.77%	7.78%	8.00%	8.30%	7.79%	8.19%	8.19%	7.92%
Jul	7.81%	7.71%	8.20%	8.05%	8.04%	8.38%	8.33%	7.72%	7.76%	8.22%	8.22%	8.04%
Aug	7.75%	7.84%	7.56%	7.59%	8.08%	8.15%	8.09%	7.58%	7.69%	8.42%	8.42%	7.92%
Sep	7.90%	7.35%	7.97%	8.39%	8.32%	7.96%	8.33%	8.08%	8.58%	8.77%	8.77%	8.22%
Oct	8.62%	8.69%	8.45%	9.16%	8.50%	8.68%	9.21%	8.57%	8.05%	8.70%	8.70%	8.67%
Nov	8.68%	8.76%	8.76%	8.55%	8.45%	9.04%	9.22%	9.21%	8.60%	8.09%	8.09%	8.68%
Dec	8.80%	9.03%	9.04%	8.71%	8.34%	9.70%	8.27%	8.50%	8.47%	8.19%	8.19%	8.66%
												100.00%

Step 3: Compare model predictions with current available actuals, this will also allow for a comparison on the model accuracy in red below.

		Energy Profiles						
		MC	Reg	MED	Actual	% Error MC	% Error Reg	% Error MED
1	Jan-12	66 395 975	62 429 194	56 614 771	56 171 833	18%	11%	1%
2	Feb-12	70 676 973	66 454 427	60 265 109	62 150 555	14%	7%	-3%
3	Mar-12	71 464 072	67 194 501	60 936 255	55 448 895	29%	21%	10%
4	Apr-12	70 678 354	66 455 725	60 266 286	58 422 850	21%	14%	3%
5	May-12	69 439 541	65 290 925	59 209 971	56 733 669	22%	15%	4%
6	Jun-12	65 950 242	62 010 091	56 234 702	57 170 514	15%	8%	-2%
7	Jul-12	66 918 894	62 920 872	57 060 656	57 377 110	17%	10%	-1%
8	Aug-12	65 958 392	62 017 754	56 241 651	58 766 478	12%	6%	-4%
9	Sep-12	68 409 838	64 322 741	58 331 960	61 186 843	12%	5%	-5%
10	Oct-12	72 122 664	67 813 747	61 497 826	60 707 649	19%	12%	1%
11	Nov-12	72 212 898	67 898 589	61 574 767	56 473 159	28%	20%	9%
12	Dec-12	72 069 596	67 763 849	61 452 576	57 175 696	26%	19%	7%
13	Jan-13	67 267 401	63 677 778	61 327 660	55 753 124	21%	14%	10%
14	Feb-13	71 604 585	67 783 515	65 281 869	71 429 153	0%	-5%	-9%
15	Mar-13	72 402 015	68 538 391	66 008 885	57 466 377	26%	19%	15%
16	Apr-13	71 605 984	67 784 840	65 283 144	58 975 228	21%	15%	11%
17	May-13	70 350 913	66 596 743	64 138 896	61 099 546	15%	9%	5%
18	Jun-13	66 815 817	63 250 293	60 915 951	55 892 838	20%	13%	9%
19	Jul-13	67 797 183	64 179 290	61 810 662	55 829 973	21%	15%	11%
20	Aug-13	66 824 074	63 258 109	60 923 479	52 888 011	26%	20%	15%
21	Sep-13	69 307 695	65 609 196	63 187 795	49 470 997	40%	33%	28%
	Average					20%	13%	6%

Step 4: Calculate the unit rate outlook and actual comparison





Years	22	Increase (c/kWh)
EIUG High 2040	1.45	0.028
EIUG Average 2040	1.22	0.018
EIUG Low 2040	0.95	0.005

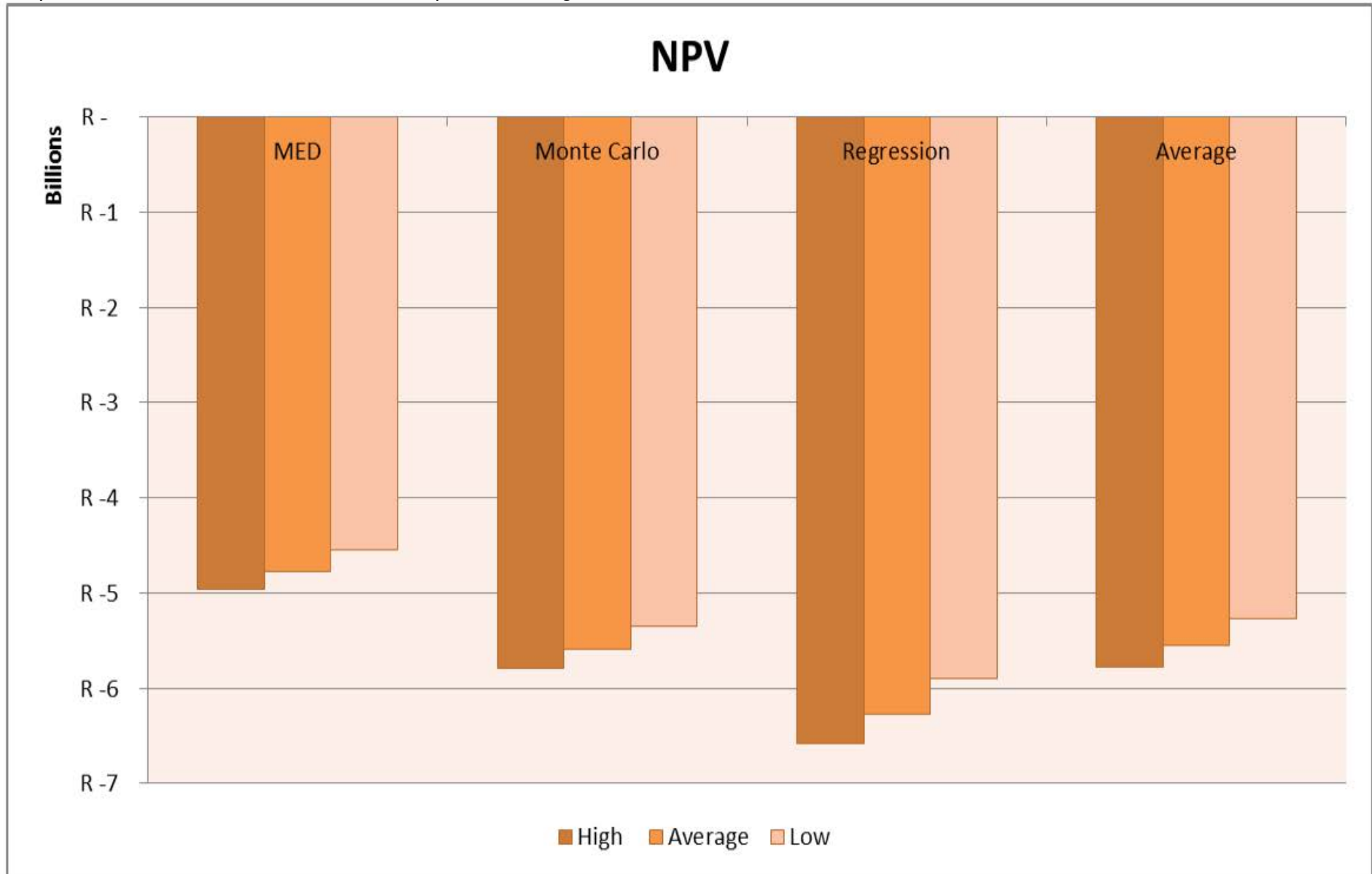
- For clarity in the figure the outlook was done up until 2030 and not 2040 as in the report

c/kWh	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EIUG High	0.58	0.66	0.71	0.74	0.77	0.80	0.83	0.862	0.890	0.918	0.946	0.974	1.002	1.030	1.058	1.086	1.114	1.142	1.170
EIUG Average	0.58	0.66	0.71	0.74	0.77	0.80	0.83	0.851	0.869	0.887	0.904	0.922	0.939	0.957	0.974	0.992	1.009	1.027	1.044
EIUG Low	0.58	0.66	0.71	0.74	0.77	0.80	0.83	0.839	0.844	0.850	0.855	0.860	0.866	0.871	0.876	0.881	0.887	0.892	0.897

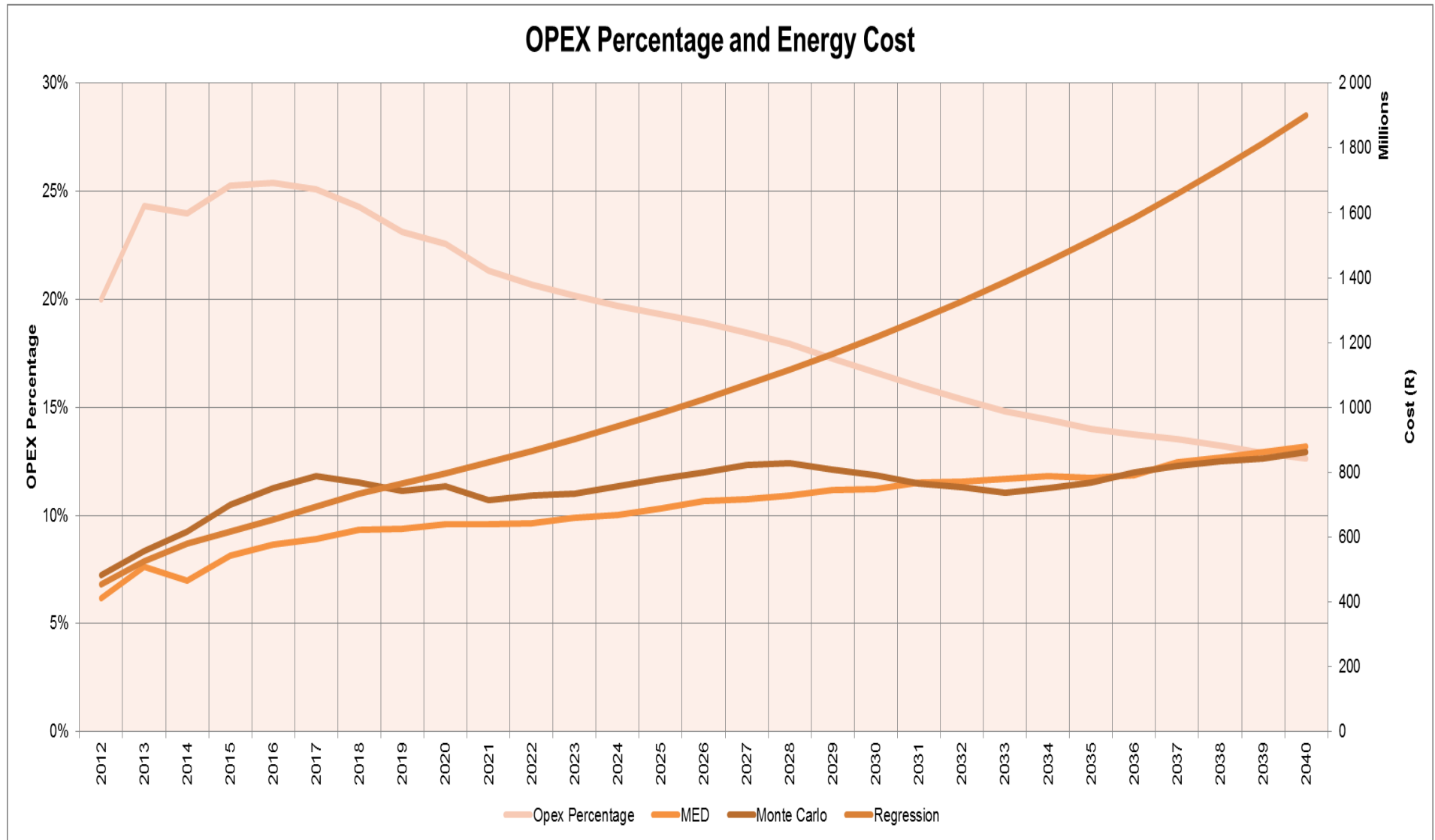
Step 5: Calculate each models associated cost from the kWh outlook on the different rates.

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
High																			
MED	R 411 618 187	R 507 384 425	R 466 529 496	R 544 158 291	R 576 752 314	R 593 153 221	R 622 252 350	R 634 235 536	R 656 452 608	R 663 590 864	R 672 691 880	R 696 211 551	R 713 966 242	R 739 982 729	R 771 716 374	R 785 154 485	R 803 864 490	R 829 007 020	R 839 662 016
Monte Carlo	R 482 732 515	R 556 525 908	R 617 847 121	R 699 336 706	R 750 368 103	R 787 745 726	R 769 259 182	R 751 344 123	R 775 140 736	R 738 536 230	R 761 410 261	R 776 470 228	R 806 141 592	R 838 265 895	R 868 184 652	R 899 813 598	R 914 309 821	R 899 447 648	R 887 205 336
Regression	R 453 892 001	R 526 827 750	R 580 353 450	R 615 638 939	R 653 069 787	R 692 776 430	R 734 897 237	R 774 770 314	R 815 944 355	R 860 157 101	R 906 370 041	R 954 701 133	R 1 005 275 425	R 1 058 225 536	R 1 113 692 178	R 1 171 824 709	R 1 232 781 730	R 1 296 731 719	R 1 363 853 724
Average																			
MED	R 411 618 187	R 507 384 425	R 466 529 496	R 544 158 291	R 576 752 314	R 593 153 221	R 622 252 350	R 626 542 310	R 641 028 363	R 640 916 500	R 642 952 146	R 658 843 501	R 669 266 429	R 687 402 383	R 710 706 546	R 717 124 175	R 728 419 683	R 745 521 015	R 749 623 960
Monte Carlo	R 482 732 515	R 556 525 908	R 617 847 121	R 699 336 706	R 750 368 103	R 787 745 726	R 769 259 182	R 742 230 380	R 756 927 753	R 713 301 042	R 727 748 284	R 734 794 421	R 755 670 888	R 778 701 923	R 799 548 301	R 821 848 561	R 828 499 428	R 808 867 847	R 792 069 149
Regression	R 453 892 001	R 526 827 750	R 580 353 450	R 615 638 939	R 653 069 787	R 692 776 430	R 734 897 237	R 765 372 412	R 796 772 636	R 830 766 227	R 866 299 386	R 903 459 065	R 942 337 402	R 983 032 072	R 1 025 646 660	R 1 070 291 062	R 1 117 081 906	R 1 166 143 017	R 1 217 605 906
Low																			
MED	R 411 618 187	R 507 384 425	R 466 529 496	R 544 158 291	R 576 752 314	R 593 153 221	R 622 252 350	R 617 511 131	R 622 921 642	R 614 298 767	R 608 040 284	R 614 976 660	R 616 792 735	R 625 677 629	R 639 086 314	R 637 262 506	R 639 854 040	R 647 515 705	R 643 927 113
Monte Carlo	R 482 732 515	R 556 525 908	R 617 847 121	R 699 336 706	R 750 368 103	R 787 745 726	R 769 259 182	R 731 531 637	R 735 547 295	R 683 677 127	R 688 232 049	R 685 870 647	R 696 422 671	R 708 778 999	R 718 975 194	R 730 324 388	R 727 765 488	R 702 535 038	R 680 387 537
Regression	R 453 892 001	R 526 827 750	R 580 353 450	R 615 638 939	R 653 069 787	R 692 776 430	R 734 897 237	R 754 340 093	R 774 266 704	R 796 263 896	R 819 259 922	R 843 305 333	R 868 453 635	R 894 761 483	R 922 288 879	R 951 099 389	R 981 260 374	R 1 012 843 237	R 1 045 923 686

Step 6: Calculate each models NPV and compare to average



Step 7: Determine the expected effect on OPEX



Appendix D - (Abbreviated Financials)

1. Abbreviated Financials (Balance and Income Statements)

Appendix A - Abbreviated Financial Statements										
ANGLOGOLD ASHANTI LIMITED (ANG)										
Statement of financial position for the year ending February										
Standardised ZAR (000)	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Ordinary Shareholders Interest	52 952 000	34 277 000	28 487 000	30 300 000	22 714 000	27 138 000	24 475 000	25 275 000	13 174 000	13 115 000
Minority Interest	1 106 000	815 000	966 000	790 000	429 000	436 000	374 000	327 000	354 000	347 000
Preference Share Capital	0	0	0	0	0	0	0	0	0	0
Total Owners Interest = Net Asset Value	54 058 000	35 092 000	29 453 000	31 090 000	23 143 000	27 574 000	24 849 000	25 602 000	13 528 000	13 462 000
Total Fixed Assets	52 472 000	40 610 000	43 802 000	41 081 000	45 783 000	42 382 000	37 464 000	33 239 000	18 466 000	19 605 000
Total Accumulated Depreciation	0	0	0	0	0	0	0	0	0	0
Total Long Term Investments	8 176 000	7 015 000	7 062 000	11 553 000	1 989 000	2 070 000	1 336 000	1 878 000	1 719 000	1 602 000
Total Long Term Liabilities	22 182 000	19 425 000	7 515 000	10 605 000	13 163 000	13 538 000	13 372 000	9 978 000	7 577 000	9 247 000
Net Investment in Long Term Assets	38 466 000	28 200 000	43 349 000	42 029 000	34 609 000	30 914 000	25 428 000	25 139 000	12 608 000	11 960 000
Inventory	11 847 000	8 116 000	7 610 000	8 373 000	6 820 000	5 430 000	3 618 000	2 487 000	2 050 000	1 848 000
Debtors	1 876 000	1 035 000	908 000	419 000	1 012 000	1 294 000	1 589 000	1 747 000	1 461 000	2 190 000
Short Term Loans Advances	5 231 000	840 000	8 575 000	9 140 000	4 457 000	5 375 000	4 631 000	3 568 000	4 485 000	2 643 000
Cash And Bank	4 013 000	3 036 000	2 535 000	2 141 000	2 735 000	2 724 000	1 072 000	962 000	1 456 000	2 900 000
Other Current Assets	643 000	393 000	384 000	1 009 000	546 000	0	100 000	0	0	0
Total Current Assets	23 610 000	13 420 000	20 012 000	21 082 000	15 570 000	14 823 000	11 010 000	8 764 000	9 452 000	9 581 000
Short Term Borrowings	256 000	886 000	28 263 000	26 472 000	21 035 000	12 565 000	8 004 000	4 807 000	5 282 000	3 307 000
Creditors	6 034 000	4 630 000	4 332 000	4 946 000	4 549 000	3 701 000	2 711 000	2 650 000	2 339 000	2 145 000
Bank Overdraft	0	0	0	0	37 000	0	0	0	0	0
Provision For Taxation	963 000	706 000	1 059 000	425 000	1 269 000	1 234 000	710 000	368 000	164 000	1 124 000
Dividends Payable	765 000	306 000	254 000	178 000	146 000	663 000	164 000	476 000	747 000	1 503 000
Total Current Liabilities	8 018 000	6 528 000	33 908 000	32 021 000	27 036 000	18 163 000	11 589 000	8 301 000	8 532 000	8 079 000
	0	0	0	0	0	0	0	0	0	0

ANGLOGOLD ASHANTI LIMITED (ANG)										
Statement of income and expenses for the year ending February										
Standardised ZAR (000)	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Turnover	50 023 000	39 824 000	31 517 000	28 686 000	24 055 000	20 886 000	17 233 000	15 348 000	15 264 000	18 372 000
Cost Of Sales	27 832 000	29 337 000	21 217 000	18 015 000	16 067 000	14 913 000	13 633 000	10 996 000	10 407 000	9 682 174
Trading Profit	22 191 000	10 487 000	10 300 000	10 671 000	7 988 000	5 973 000	3 600 000	4 352 000	4 857 000	8 689 826
Investment Income	388 000	311 000	444 000	536 000	328 000	218 000	155 000	285 000	294 000	392 000
Profits Extraordinary Nature	2 683 000	-670 000	-5 852 000	-20 280 000	-4 694 000	120 000	185 000	451 000	663 000	857 000
Total Income	25 262 000	10 128 000	4 892 000	-9 073 000	3 622 000	6 311 000	3 940 000	5 088 000	5 814 000	9 938 826
Depreciation	5 582 000	5 022 000	4 615 000	4 620 000	4 143 000	4 059 000	3 203 000	2 423 000	1 739 000	2 566 000
Operating Expenses	7 399 000	6 338 000	5 704 000	5 592 000	5 579 000	4 636 000	3 844 000	5 416 000	2 902 000	6 724 826
Profit Before Interest And Tax (EBIT)	17 863 000	3 790 000	-812 000	-14 665 000	-1 957 000	1 675 000	96 000	-328 000	2 912 000	3 214 000
Total Interest Paid	1 417 000	1 203 000	1 146 000	926 000	880 000	822 000	629 000	512 000	362 000	464 000
Profit Before Taxation	16 446 000	2 587 000	-1 958 000	-15 591 000	-2 837 000	853 000	-533 000	-840 000	2 550 000	2 750 000
Taxation	5 291 000	2 709 000	544 000	-2 085 000	1 008 000	1 215 000	-518 000	-56 000	1 317 000	1 719 000
Profit After Taxation	11 155 000	-122 000	-2 502 000	-13 506 000	-3 845 000	-362 000	-15 000	-784 000	1 233 000	1 031 000
Minority Interest In Profit	342 000	381 000	417 000	324 000	222 000	202 000	146 000	124 000	135 000	157 000
Profit to Ord. & Pref. Shareholders	10 813 000	-503 000	-2 919 000	-13 830 000	-4 067 000	-564 000	-161 000	-916 000	771 000	874 000
Ordinary Dividend	1 454 000	543 000	469 000	353 000	397 000	1 241 000	614 000	925 000	1 583 000	3 008 000
Preference Dividend	0	0	0	0	0	0	0	0	0	0
Profit in Associated Companies	-532 000	-467 000	-785 000	1 177 000	164 000	6 000	17 000	-1 000	-3 000	-18 000
Retained Profits	9 891 000	-579 000	-2 603 000	-15 360 000	-4 628 000	-1 811 000	-792 000	-1 840 000	-809 000	-2 116 000

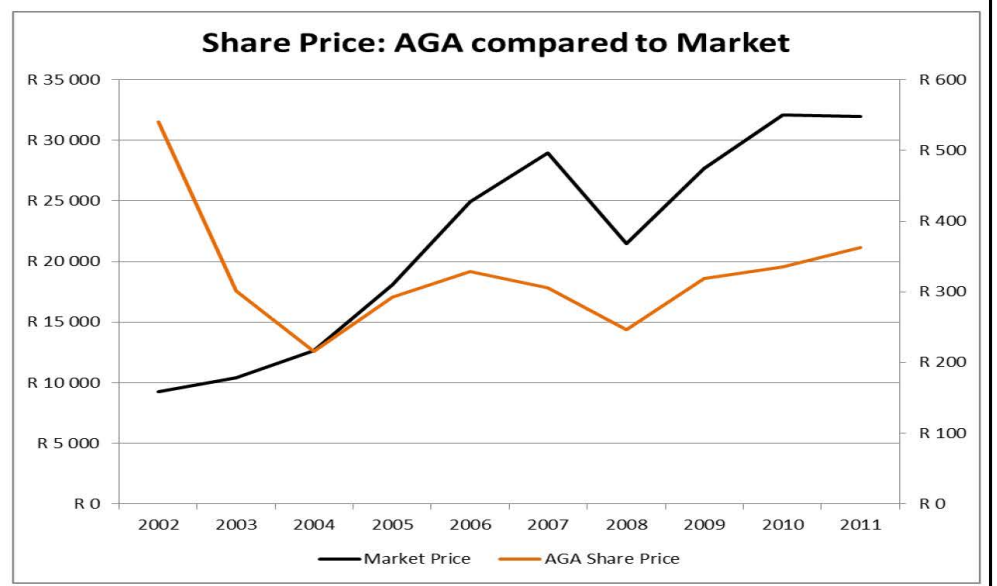
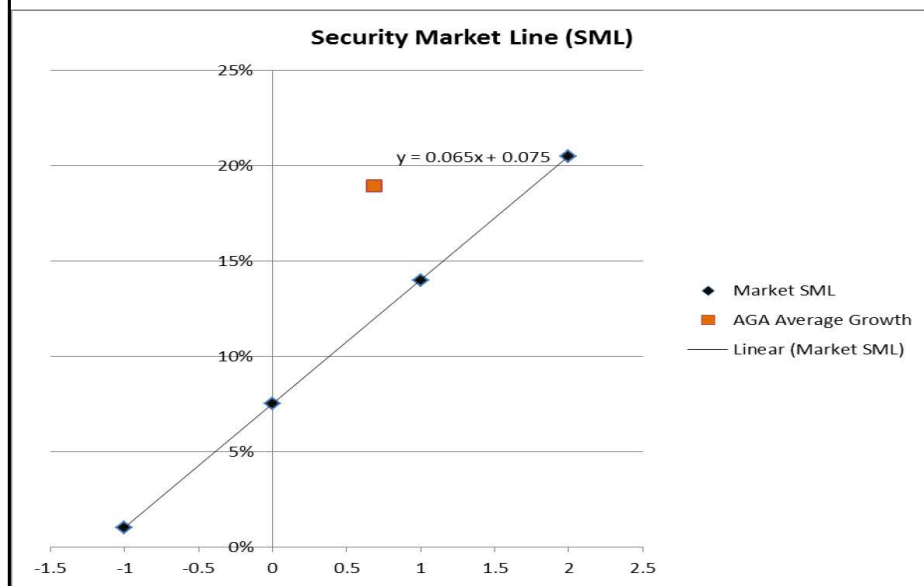
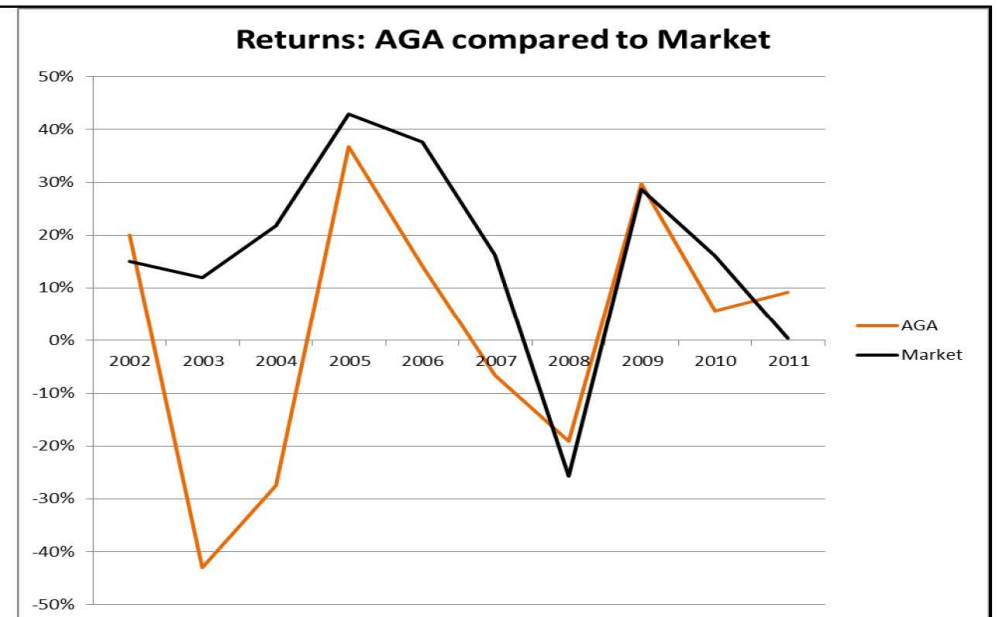
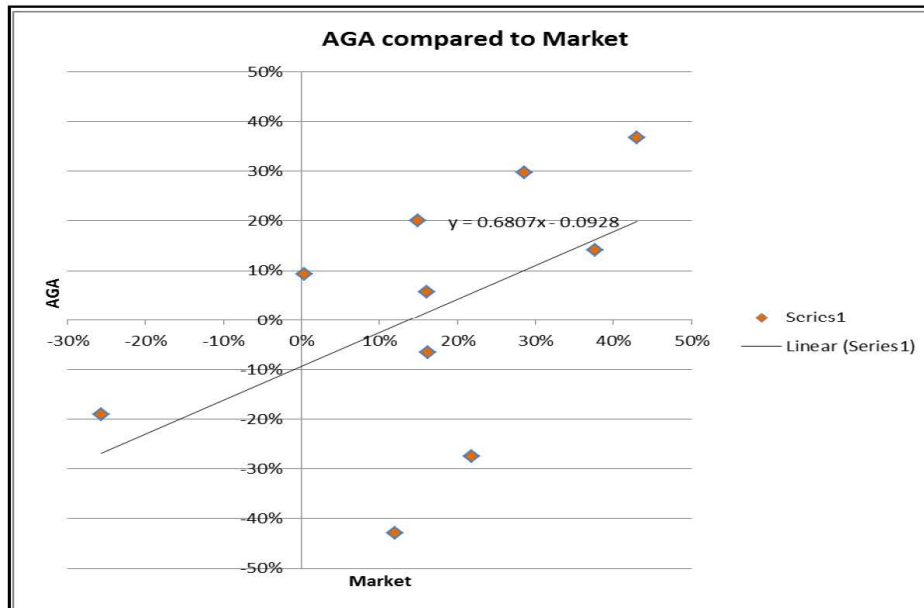
ANGLOGOLD ASHANTI LIMITED (ANG)										
Indicators for the year ending February										
	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Current Ratio	2.94	2.06	0.59	0.66	0.58	0.82	0.95	1.06	1.11	1.19
Quick Ratio	1.47	0.81	0.37	0.4	0.32	0.52	0.64	0.76	0.87	0.96
Dividend / Share (c)	380	145	130	100	143	450	232	350	710	1350
Dividend Cover	7.8	-0.07	-4.55	-42.51	-10.66	-0.46	-0.29	-0.99	0.49	0.3
Dividend per Share %	-10.24	-8.63	28.7	45.95	9.9	38.36	17.74	-8.15	-14.01	124.29
Dividend Yield %	1.05	0.42	0.4	0.4	0.47	1.36	0.79	1.62	2.35	2.5
Earnings / Share (c)	2773	259	-1880	-1379	-1470	-307	-273	280	1068	1767
Earnings Attributable										
Earnings per Share	-9243.44	-95.12	-81.47	251.26	962.15	2313.33	-98.11	-187.42	-12.12	-72.22
Earnings Yield %	7.65	0.77	-5.9	-5.6	-4.81	-0.93	-0.93	1.3	3.54	3.27
Growth - Internal Rate (After Tax)	351.04	-4.18	-1.29	-132.73	11	-2.98	-0.93	-0.42	-2.75	-4.03
Growth - Sustainable (After Tax)	51.48	-4.04	-5.03	-301.17	-20.55	-3.16	1.38	0.22	-2.49	-4.41
Growth in cash from operating activities	251.09	263.61	-113.21	-2126.01	-86.66	90.99	136.15	-73.43	-30.8	-31.44
Interest Cover	1382.29	-476.31	329.93	581.75	710.68	951.95	618.76	641.99	1037.57	1450.22
Leverage Factor	1.7	-0.5	-1.56	-4.26	-6.44	-3.57	-0.75	2.17	1.81	3.13
Retention Rate %	91.47	115.11	89.17	111.06	113.79	321.1	491.93	200.87	-104.93	-242.11
Share price at financial year end	36257	33530	31840	24642	30582	32909	29213	21540	30148	54064

ANGLOGOLD ASHANTI LIMITED (ANG)										
Financial measures for the year ending February										
	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
SA Normal Taxrate	28%	28%	28%	28%	29%	29%	29%	30%	30%	30%
NOPAD = EBIT(1-T)	12 861 360	2 728 800	-584 640	-10 558 800	-1 389 470	1 189 250	68 160	-229 600	2 038 400	2 249 800
OCF = NOPAD + Depreciation	18 443 360	7 750 800	4 030 360	-5 938 800	2 753 530	5 248 250	3 271 160	2 193 400	3 777 400	4 815 800
ΔNCA = ΔFA	11 862 000	-3 192 000	2 721 000	-4 702 000	3 401 000	4 918 000	4 225 000	14 773 000	-1 139 000	19 605 000
ΔCA	5 799 000	1 143 000	-505 000	829 000	1 665 000	3 069 000	1 183 000	229 000	-1 971 000	6 938 000
ΔCL	1 404 000	298 000	-614 000	397 000	848 000	990 000	61 000	311 000	194 000	2 145 000
NCA	52 472 000	40 610 000	43 802 000	41 081 000	45 783 000	42 382 000	37 464 000	33 239 000	18 466 000	19 605 000
ΔNIOC=ΔNCA-(ΔCA-ΔCL)	7 467 000	-4 037 000	2 612 000	-5 134 000	2 584 000	2 839 000	3 103 000	14 855 000	1 026 000	14 812 000
FCF=OCF-ΔNCA-(ΔCA-ΔCL)	10 976 360	11 787 800	1 418 360	-804 800	169 530	2 409 250	168 160	-12 661 600	2 751 400	-9 996 200
FCF=OCF-ΔNIOC	10 976 360	11 787 800	1 418 360	-804 800	169 530	2 409 250	168 160	-12 661 600	2 751 400	-9 996 200
Operating current assets (OCA)	18 379 000	12 580 000	11 437 000	11 942 000	11 113 000	9 448 000	6 379 000	5 196 000	4 967 000	6 938 000
Operating current liabilities (OCL)	6 034 000	4 630 000	4 332 000	4 946 000	4 549 000	3 701 000	2 711 000	2 650 000	2 339 000	2 145 000
NOWC=OCA-OCL	12 345 000	7 950 000	7 105 000	6 996 000	6 564 000	5 747 000	3 668 000	2 546 000	2 628 000	4 793 000
Gross Profit Margin	51%	25%	16%	-32%	15%	30%	23%	33%	38%	54%
Operating Profit Margin	36%	10%	-3%	-51%	-8%	8%	1%	-2%	19%	17%
Net Profit Margin	22%	-1%	-9%	-48%	-17%	-3%	-1%	-6%	5%	5%
Return on Equity (ROE)	20%	-1%	-10%	-46%	-18%	-2%	-1%	-4%	6%	7%
Du Pont	20%	-1%	-10%	-44%	-18%	-2%	-1%	-4%	6%	6%
	-5%									
Share Data - Historical										
Shares	382 965	381 889	366 036	357 450	277 944	276 707	264 938	264 463	223 136	222 622
Earnings per share (Dividends)	380	142	128	99	143	448	232	350	709	1351
Capital Gains (Share Growth)	2727	1690	7198	-5940	-2327	3696	7673	-8608	-23916	
Total Earnings per share	3107	1832	7326	-5841	-2184	4144	7905	-8258	-23207	
Return	9%	6%	30%	-19%	-7%	14%	37%	-27%	-43%	20%
Growth	19%	-2%	-9%	-51%	-20%	-7%	-3%	-7%	-6%	10%
Share Growth	8%	5%	29%	-19%	-7%	13%	36%	-29%	-44%	
Dividend Yield %	12%	8%	2%	-2%	-7%	11%	3%	-4%	-3%	
Capital Gains Yield %	88%	92%	98%	102%	107%	89%	97%	104%	103%	

2. Abbreviated Financials (Capital Asset Pricing Model and Security Market Line)

		Period	AGA	AGA Share Price	Market	Market	Market Price
		2002	20%	R 540.64	15%	15%	R 9 277.22
		2003	-43%	R 301.48	12%	12%	R 10 387.22
		2004	-27%	R 215.40	22%	22%	R 12 656.86
		2005	37%	R 292.13	43%	43%	R 18 096.54
		2006	14%	R 329.09	38%	38%	R 24 915.20
		2007	-7%	R 305.82	16%	16%	R 28 957.97
		2008	-19%	R 246.42	-26%	-26%	R 21 509.20
		2009	30%	R 318.40	29%	29%	R 27 666.45
		2010	6%	R 335.30	16%	16%	R 32 118.89
		2011	9%	R 362.57	0.4%	0.4%	R 31 985.67
		2012	15%	R 416.65	15%	15%	R 36 798.01
		2013	12%	R 466.65	15%	15%	R 42 334.38
		2014	12%	R 522.65	15%	15%	R 48 703.72
		2015	12%	R 585.37	15%	15%	R 56 031.34
Statistics			AGA		Market		
Variance			167.6639		199.77		
Average			15%		15%		
Standard Deviation			13%		14%		
Correlation			0.75		1.00		
Covariance			0.01		0.02		
Beta			0.69		1		

Propablity Distribution Economy	Return	Propablity AGA	AGA Average		Market Average	Propablity Market
Recession	P(X<=0)	12%	-24%		5%	14%
Average	P(0<=X<=15)	38%	10%		0%	36%
Above Average	P(X>15)	50%	37%		27%	50%
		100%				100%
Expected Rate of Return (r^)			18.94%			14.38%
Market Risk Free Return	Rf	8%				
Market Return	Rm	14.00%				
RP_m		6.50%				
Required Rate of Return (AGA)	Ri	11.96%				
Required Rate of Return (Market)	Ri	14.00%				
Security Market Line						
SML	X	Y				
Market	-1	1%				
	0	8%				
	1	14%				
	2	21%				
AGA Average Growth	0.69	18.94%				
AGA Above Average	0.69	15.00%				
AGA Recession	0.69	0.00%				
AGA Share Prices						
Period	Average Growth (12%)	Recession	Above Average	Expected (5%)		
	12%	-20%	25%	5%		
2012	R 406.08	R 290.06	R 453.21	R 380.70		
2013	R 454.81	R 232.04	R 566.52	R 399.73		
2014	R 509.38	R 185.64	R 708.14	R 419.72		
2015	R 570.51	R 148.51	R 885.18	R 440.71		
2016	R 638.97	R 118.81	R 1 106.48	R 462.74		
2017	R 715.65	R 95.05	R 1 383.09	R 485.88		



November 1, 2013



Mr Jean Greyling

12874469

Re: Letter of confirmation of language editing

The MBA dissertation “**Mine energy budget forecasting: The value of statistical models in predicting consumption profiles for management systems**” by **Jean Greyling** (12874469) was language, technically and typographically edited. The sources and referencing technique applied was checked to comply with the specific Harvard technique as per North-West University prescriptions.

A handwritten signature in black ink, appearing to read 'Antoinette Bisschoff', written in a cursive style.

Antoinette Bisschoff

Officially approved language editor of the NWU
Member of SAVI no 100181