						Co	mpleted Campus LCC	w/ Norn	nal Fuel escalation	on								
			E	xisting Design LC	C	I			esign LCC w/ Sce			Alternate Design LCC w/ Scenario 2						
Capital Cost		\$ 759,814					\$ 5,368,043		<u> </u>			\$ 5,368,043						
Ann. Elec. Cost		\$ 13,234,990					\$ 6,032,350					\$ 4,716,019						
Ann. NG Cost		\$ 8,091,039					\$ 10,308,201					\$ 10,792,638						
Real Discount rate		3%					3%					3%						
		O&M	N	latural Gas	Electricity		O&M	M Natural Gas		Electricity		O&M	Natural Gas		Е	lectricity		
Date	Year	Boiler	UPV	Cost	UPV	Cost	Boiler & CHP	UPV	Cost	UPV	Cost	Boiler & CHP	UPV	Cost	UPV	Cost		
2008	1	\$17,795	0.96	\$7,767,398	0.97	\$12,837,941	\$410,173	0.96	\$9,895,873	0.97	\$5,851,380	\$431,517	0.96	\$10,360,932	0.97	\$4,574,538		
2009	2	\$17,795	0.92	\$7,443,756	0.94	\$12,440,891	\$410,173	0.92	\$9,483,545	0.94	\$5,670,409	\$431,517	0.92	\$9,929,227	0.94	\$4,433,057		
2010	3	\$17,795	0.89	\$7,201,025	0.90	\$11,911,491	\$410,173	0.89	\$9,174,299	0.90	\$5,429,115	\$431,517	0.89	\$9,605,448	0.90	\$4,244,417		
2011	4	\$17,795	0.85	\$6,877,383	0.87	\$11,514,442	\$410,173	0.85	\$8,761,971	0.87	\$5,248,145	\$431,517	0.85	\$9,173,742	0.87	\$4,102,936		
2012	5	\$17,795	0.83	\$6,715,563	0.86	\$11,382,092	\$410,173	0.83	\$8,555,807	0.86	\$5,187,821	\$431,517	0.83	\$8,957,890	0.86	\$4,055,776		
2013	6	\$17,795	0.81	\$6,553,742	0.87	\$11,514,442	\$410,173	0.81	\$8,349,643	0.87	\$5,248,145	\$431,517	0.81	\$8,742,037	0.87	\$4,102,936		
2014	7	\$17,795	0.80	\$6,472,831	0.86	\$11,382,092	\$410,173	0.80	\$8,246,561	0.86	\$5,187,821	\$431,517	0.80	\$8,634,110	0.86	\$4,055,776		
2015	8	\$17,795	0.80	\$6,472,831	0.87	\$11,514,442	\$410,173	0.80	\$8,246,561	0.87	\$5,248,145	\$431,517	0.80	\$8,634,110	0.87	\$4,102,936		
2016	9	\$17,795	0.80	\$6,472,831	0.87	\$11,514,442	\$410,173	0.80	\$8,246,561	0.87	\$5,248,145	\$431,517	0.80	\$8,634,110	0.87	\$4,102,936		
2017	10	\$17,795	0.82	\$6,634,652	0.87	\$11,514,442	\$410,173	0.82	\$8,452,725	0.87	\$5,248,145	\$431,517	0.82	\$8,849,963	0.87	\$4,102,936		
2018	11	\$17,795	0.82	\$6,634,652	0.89	\$11,779,141	\$410,173	0.82	\$8,452,725	0.89	\$5,368,792	\$431,517	0.82	\$8,849,963	0.89	\$4,197,256		
2019	12	\$17,795	0.81	\$6,553,742	0.89	\$11,779,141	\$410,173	0.81	\$8,349,643	0.89	\$5,368,792	\$431,517	0.81	\$8,742,037	0.89	\$4,197,256		
2020	13	\$17,795	0.82	\$6,634,652	0.89	\$11,779,141	\$410,173	0.82	\$8,452,725	0.89	\$5,368,792	\$431,517	0.82	\$8,849,963	0.89	\$4,197,256		
2021	14	\$17,795	0.81	\$6,553,742	0.89	\$11,779,141	\$410,173	0.81	\$8,349,643	0.89	\$5,368,792	\$431,517	0.81	\$8,742,037	0.89	\$4,197,256		
2022	15	\$17,795	0.82	\$6,634,652	0.89	\$11,779,141	\$410,173	0.82	\$8,452,725	0.89	\$5,368,792	\$431,517	0.82	\$8,849,963	0.89	\$4,197,256		
2023	16	\$17,795	0.83	\$6,715,563	0.89	\$11,779,141	\$410,173	0.83	\$8,555,807	0.89	\$5,368,792	\$431,517	0.83	\$8,957,890	0.89	\$4,197,256		
2024	17	\$17,795	0.84	\$6,796,473	0.89	\$11,779,141	\$410,173	0.84	\$8,658,889	0.89	\$5,368,792	\$431,517	0.84	\$9,065,816	0.89	\$4,197,256		
2025	18	\$17,795	0.84	\$6,796,473	0.90	\$11,911,491	\$410,173	0.84	\$8,658,889	0.90	\$5,429,115	\$431,517	0.84	\$9,065,816	0.90	\$4,244,417		
2026	19	\$17,795	0.84	\$6,796,473	0.89	\$11,779,141	\$410,173	0.84	\$8,658,889	0.89	\$5,368,792	\$431,517	0.84	\$9,065,816	0.89	\$4,197,256		
2027	20	\$17,795	0.84	\$6,796,473	0.89	\$11,779,141	\$410,173	0.84	\$8,658,889	0.89	\$5,368,792	\$431,517	0.84	\$9,065,816	0.89	\$4,197,256		
Column NPV		\$264,751		\$101,236,968		\$175,363,473	\$6,102,342		\$128,978,610		\$79,928,572	\$6,419,889		\$135,040,000		\$62,487,193		
Total NPV						\$277,625,007					\$220,377,567					\$209,315,124		
Total Saving (20 yr)							\$ 57,247,440					\$ 68,309,883						
Saving / yr							\$ 2,862,372					\$ 3,415,494						
							yr.	mo.				yr.	mo.					
Payback Period (yr)							1	7				1	4			1		

City Hospital Building System Integration

Appendix xv

						Complete	d Campus LCC w/ 75%	increase	in Electricity Co	st by 201	11					
			Е	xisting Design LC	CC		Al	Design LCC w/ Sce		Alternate Design LCC w/ Scenario 2						
Capital Cost		\$ 759,814					\$ 5,368,043					\$ 5,368,043				
Ann. Elec. Cost		\$ 13,234,990					\$ 6,032,350					\$ 4,716,019				
Ann. NG Cost		\$ 8,091,039					\$ 10,308,201					\$ 10,792,638				
Real Discount rate		3%					3%					3%				
		O&M Natural Gas		Electricity		O&M Natur		atural Gas	Electricity		O&M		tural Gas	Е	lectricity	
Date	Year	Boiler	Esc.	Cost	Esc.	Cost	Boiler & CHP	Esc.	Cost	Esc.	Cost	Boiler & CHP	Esc.	Cost	Esc.	Cost
2008	1	\$17,795	0.96	\$7,767,398	0.97	\$12,837,941	\$410,173	0.96	\$10,360,932	0.97	\$5,851,380	\$431,517	0.96	\$10,360,932	0.97	\$4,574,538
2009	2	\$17,795	0.92	\$7,443,756	0.94	\$12,440,891	\$410,173	0.92	\$9,929,227	0.94	\$5,670,409	\$431,517	0.92	\$9,929,227	0.94	\$4,433,057
2010	3	\$17,795	0.89	\$7,201,025	0.90	\$11,911,491	\$410,173	0.89	\$9,605,448	0.90	\$5,429,115	\$431,517	0.89	\$9,605,448	0.90	\$4,244,417
2011	4	\$17,795	0.85	\$6,877,383	1.52	\$20,150,273	\$410,173	0.85	\$9,173,742	1.52	\$9,184,253	\$431,517	0.85	\$9,173,742	1.52	\$7,180,138
2012	5	\$17,795	0.83	\$6,715,563	1.51	\$19,918,660	\$410,173	0.83	\$8,957,890	1.51	\$9,078,687	\$431,517	0.83	\$8,957,890	1.51	\$7,097,608
2013	6	\$17,795	0.81	\$6,553,742	1.52	\$20,150,273	\$410,173	0.81	\$8,742,037	1.52	\$9,184,253	\$431,517	0.81	\$8,742,037	1.52	\$7,180,138
2014	7	\$17,795	0.80	\$6,472,831	1.51	\$19,918,660	\$410,173	0.80	\$8,634,110	1.51	\$9,078,687	\$431,517	0.80	\$8,634,110	1.51	\$7,097,608
2015	8	\$17,795	0.80	\$6,472,831	1.52	\$20,150,273	\$410,173	0.80	\$8,634,110	1.52	\$9,184,253	\$431,517	0.80	\$8,634,110	1.52	\$7,180,138
2016	9	\$17,795	0.80	\$6,472,831	1.52	\$20,150,273	\$410,173	0.80	\$8,634,110	1.52	\$9,184,253	\$431,517	0.80	\$8,634,110	1.52	\$7,180,138
2017	10	\$17,795	0.82	\$6,634,652	1.52	\$20,150,273	\$410,173	0.82	\$8,849,963	1.52	\$9,184,253	\$431,517	0.82	\$8,849,963	1.52	\$7,180,138
2018	11	\$17,795	0.82	\$6,634,652	1.56	\$20,613,497	\$410,173	0.82	\$8,849,963	1.56	\$9,395,385	\$431,517	0.82	\$8,849,963	1.56	\$7,345,199
2019	12	\$17,795	0.81	\$6,553,742	1.56	\$20,613,497	\$410,173	0.81	\$8,742,037	1.56	\$9,395,385	\$431,517	0.81	\$8,742,037	1.56	\$7,345,199
2020	13	\$17,795	0.82	\$6,634,652	1.56	\$20,613,497	\$410,173	0.82	\$8,849,963	1.56	\$9,395,385	\$431,517	0.82	\$8,849,963	1.56	\$7,345,199
2021	14	\$17,795	0.81	\$6,553,742	1.56	\$20,613,497	\$410,173	0.81	\$8,742,037	1.56	\$9,395,385	\$431,517	0.81	\$8,742,037	1.56	\$7,345,199
2022	15	\$17,795	0.82	\$6,634,652	1.56	\$20,613,497	\$410,173	0.82	\$8,849,963	1.56	\$9,395,385	\$431,517	0.82	\$8,849,963	1.56	\$7,345,199
2023	16	\$17,795	0.83	\$6,715,563	1.56	\$20,613,497	\$410,173	0.83	\$8,957,890	1.56	\$9,395,385	\$431,517	0.83	\$8,957,890	1.56	\$7,345,199
2024	17	\$17,795	0.84	\$6,796,473	1.56	\$20,613,497	\$410,173	0.84	\$9,065,816	1.56	\$9,395,385	\$431,517	0.84	\$9,065,816	1.56	\$7,345,199
2025	18	\$17,795	0.84	\$6,796,473	1.58	\$20,845,110	\$410,173	0.84	\$9,065,816	1.58	\$9,500,952	\$431,517	0.84	\$9,065,816	1.58	\$7,427,729
2026	19	\$17,795	0.84	\$6,796,473	1.56	\$20,613,497	\$410,173	0.84	\$9,065,816	1.56	\$9,395,385	\$431,517	0.84	\$9,065,816	1.56	\$7,345,199
2027	20	\$17,795	0.84	\$6,796,473	1.56	\$20,613,497	\$410,173	0.84	\$9,065,816	1.56	\$9,395,385	\$431,517	0.84	\$9,065,816	1.56	\$7,345,199
Column NPV		\$264,751		\$101,236,968		\$280,567,487	\$6,102,342		\$135,040,000		\$127,879,303	\$6,419,889		\$135,040,000		\$99,974,495
Total NPV						\$382,829,021					\$274,389,688					\$246,802,427
Total Saving (30 yr)							\$ 108,439,334					\$ 136,026,594				
Saving / yr							\$ 5,421,967					\$ 6,801,330				
							yr.	mo.				yr.	mo.			
Payback Period (yr)							-	10				-	8			

City Hospital Building System Integration

Appendix xvi

						С	ompleted Campus w/ 1	L5% increase	e in elec. cost by	2011								
				Existing Design LC	С			Alternate D	esign LCC w/ Scer	nario 1		Alternate Design LCC w/ Scenario 2						
Capital Cost		\$ 759,814					\$ 5,368,043					\$ 5,368,043						
Ann. Elec. Cost		\$ 13,234,990					\$ 6,032,350					\$ 4,716,019						
Ann. NG Cost		\$ 8,091,039					\$ 10,308,201					\$ 10,792,638						
Real Discount rate		3%					3%					3%						
		O&M	N	atural Gas	El	ectricity	O&M Natural Gas			El	lectricity	O&M	Nat	ural Gas	El	ectricity		
Date	Year	Boiler	Esc.	Cost	Esc.	Cost	Boiler & CHP	Esc.	Cost	Esc.	Cost	Boiler & CHP	Esc.	Cost	Esc.	Cost		
2008	1	\$17,795	0.96	\$7,767,398	0.97	\$12,837,941	\$410,173	0.96	\$10,360,932	0.97	\$5,851,380	\$431,517	0.96	\$10,360,932	0.97	\$4,574,538		
2009	2	\$17,795	0.92	\$7,443,756	1.08	\$14,307,024	\$410,173	0.92	\$9,929,227	1.08	\$5,098,016	\$431,517	0.92	\$9,929,227	1.08	\$5,098,016		
2010	3	\$17,795	0.89	\$7,201,025	1.04	\$13,698,215	\$410,173	0.89	\$9,605,448	1.04	\$4,881,079	\$431,517	0.89	\$9,605,448	1.04	\$4,881,079		
2011	4	\$17,795	0.85	\$6,877,383	1.00	\$13,241,608	\$410,173	0.85	\$9,173,742	1.00	\$4,718,377	\$431,517	0.85	\$9,173,742	1.00	\$4,718,377		
2012	5	\$17,795	0.83	\$6,715,563	0.99	\$13,089,405	\$410,173	0.83	\$8,957,890	0.99	\$4,664,142	\$431,517	0.83	\$8,957,890	0.99	\$4,664,142		
2013	6	\$17,795	0.81	\$6,553,742	1.00	\$13,241,608	\$410,173	0.81	\$8,742,037	1.00	\$4,718,377	\$431,517	0.81	\$8,742,037	1.00	\$4,718,377		
2014	7	\$17,795	0.80	\$6,472,831	0.99	\$13,089,405	\$410,173	0.80	\$8,634,110	0.99	\$4,664,142	\$431,517	0.80	\$8,634,110	0.99	\$4,664,142		
2015	8	\$17,795	0.80	\$6,472,831	1.00	\$13,241,608	\$410,173	0.80	\$8,634,110	1.00	\$4,718,377	\$431,517	0.80	\$8,634,110	1.00	\$4,718,377		
2016	9	\$17,795	0.80	\$6,472,831	1.00	\$13,241,608	\$410,173	0.80	\$8,634,110	1.00	\$4,718,377	\$431,517	0.80	\$8,634,110	1.00	\$4,718,377		
2017	10	\$17,795	0.82	\$6,634,652	1.00	\$13,241,608	\$410,173	0.82	\$8,849,963	1.00	\$4,718,377	\$431,517	0.82	\$8,849,963	1.00	\$4,718,377		
2018	11	\$17,795	0.82	\$6,634,652	1.02	\$13,546,013	\$410,173	0.82	\$8,849,963	1.02	\$4,826,845	\$431,517	0.82	\$8,849,963	1.02	\$4,826,845		
2019	12	\$17,795	0.81	\$6,553,742	1.02	\$13,546,013	\$410,173	0.81	\$8,742,037	1.02	\$4,826,845	\$431,517	0.81	\$8,742,037	1.02	\$4,826,845		
2020	13	\$17,795	0.82	\$6,634,652	1.02	\$13,546,013	\$410,173	0.82	\$8,849,963	1.02	\$4,826,845	\$431,517	0.82	\$8,849,963	1.02	\$4,826,845		
2021	14	\$17,795	0.81	\$6,553,742	1.02	\$13,546,013	\$410,173	0.81	\$8,742,037	1.02	\$4,826,845	\$431,517	0.81	\$8,742,037	1.02	\$4,826,845		
2022	15	\$17,795	0.82	\$6,634,652	1.02	\$13,546,013	\$410,173	0.82	\$8,849,963	1.02	\$4,826,845	\$431,517	0.82	\$8,849,963	1.02	\$4,826,845		
2023	16	\$17,795	0.83	\$6,715,563	1.02	\$13,546,013	\$410,173	0.83	\$8,957,890	1.02	\$4,826,845	\$431,517	0.83	\$8,957,890	1.02	\$4,826,845		
2024	17	\$17,795	0.84	\$6,796,473	1.02	\$13,546,013	\$410,173	0.84	\$9,065,816	1.02	\$4,826,845	\$431,517	0.84	\$9,065,816	1.02	\$4,826,845		
2025	18	\$17,795	0.84	\$6,796,473	1.04	\$13,698,215	\$410,173	0.84	\$9,065,816	1.04	\$4,881,079	\$431,517	0.84	\$9,065,816	1.04	\$4,881,079		
2026	19	\$17,795	0.84	\$6,796,473	1.02	\$13,546,013	\$410,173	0.84	\$9,065,816	1.02	\$4,826,845	\$431,517	0.84	\$9,065,816	1.02	\$4,826,845		
2027	20	\$17,795	0.84	\$6,796,473	1.02	\$13,546,013	\$410,173	0.84	\$9,065,816	1.02	\$4,826,845	\$431,517	0.84	\$9,065,816	1.02	\$4,826,845		
Column NPV		\$264,751		\$101,236,968		\$199,798,391	\$6,102,342		\$135,040,000		\$72,433,729	\$6,419,889		\$135,040,000		\$71,194,077		
Total NPV						\$302,059,925					\$218,944,114					\$218,022,009		
Total Saving (20 vm)							\$ 83,115,811					\$ 84,037,917						
Total Saving (30 yr) Saving / yr						+	\$ 83,115,811					\$ 84,037,917 \$ 4,201,896						
3, ,							yr.	mo.				yr.	mo.					
Payback Period (yr)							1	1				1	1					

City Hospital Building System Integration

Appendix xvii

	Completed Campus LCC w/ 15% increase in Natural Gas Cost by 2009																
				Existing Design L	CC			Design LCC w/ Sce	nario 1		Alternate Design LCC w/ Scenario 2						
Capital Cost		\$ 759,814					\$ 5,368,043					\$ 5,368,043					
Ann. Elec. Cost		\$ 13,234,990					\$ 6,032,350					\$ 4,716,019			i		
Ann. NG Cost		\$ 8,091,039					\$ 10,308,201					\$ 10,792,638			i		
Real Discount rate		3%					3%					3%			i		
		O&M	N	latural Gas	Ele	ctricity	O&M	M Natural Gas		Ele	ectricity	O&M	Natural Gas		Ele	ctricity	
Date	Year	Boiler	Esc.	Cost	Esc.	Cost	Boiler & CHP	Esc.	Cost	Esc.	Cost	Boiler & CHP	Esc.	Cost	Esc.	Cost	
2008	1	\$17,795	0.96	\$7,767,398	0.97	\$12,837,941	\$410,173	0.96	\$10,360,932	0.97	\$5,851,380	\$431,517	0.96	\$10,360,932	0.97	\$4,574,538	
2009	2	\$17,795	1.06	\$8,560,320	0.94	\$12,440,891	\$410,173	1.06	\$11,418,611	0.94	\$5,670,409	\$431,517	1.06	\$11,418,611	0.94	\$4,433,057	
2010	3	\$17,795	1.02	\$8,281,179	0.90	\$11,911,491	\$410,173	1.02	\$11,046,265	0.90	\$5,429,115	\$431,517	1.02	\$11,046,265	0.90	\$4,244,417	
2011	4	\$17,795	0.98	\$7,908,991	0.87	\$11,514,442	\$410,173	0.98	\$10,549,804	0.87	\$5,248,145	\$431,517	0.98	\$10,549,804	0.87	\$4,102,936	
2012	5	\$17,795	0.95	\$7,722,897	0.86	\$11,382,092	\$410,173	0.95	\$10,301,573	0.86	\$5,187,821	\$431,517	0.95	\$10,301,573	0.86	\$4,055,776	
2013	6	\$17,795	0.93	\$7,536,803	0.87	\$11,514,442	\$410,173	0.93	\$10,053,342	0.87	\$5,248,145	\$431,517	0.93	\$10,053,342	0.87	\$4,102,936	
2014	7	\$17,795	0.92	\$7,443,756	0.86	\$11,382,092	\$410,173	0.92	\$9,929,227	0.86	\$5,187,821	\$431,517	0.92	\$9,929,227	0.86	\$4,055,776	
2015	8	\$17,795	0.92	\$7,443,756	0.87	\$11,514,442	\$410,173	0.92	\$9,929,227	0.87	\$5,248,145	\$431,517	0.92	\$9,929,227	0.87	\$4,102,936	
2016	9	\$17,795	0.92	\$7,443,756	0.87	\$11,514,442	\$410,173	0.92	\$9,929,227	0.87	\$5,248,145	\$431,517	0.92	\$9,929,227	0.87	\$4,102,936	
2017	10	\$17,795	0.94	\$7,629,850	0.87	\$11,514,442	\$410,173	0.94	\$10,177,458	0.87	\$5,248,145	\$431,517	0.94	\$10,177,458	0.87	\$4,102,936	
2018	11	\$17,795	0.94	\$7,629,850	0.89	\$11,779,141	\$410,173	0.94	\$10,177,458	0.89	\$5,368,792	\$431,517	0.94	\$10,177,458	0.89	\$4,197,256	
2019	12	\$17,795	0.93	\$7,536,803	0.89	\$11,779,141	\$410,173	0.93	\$10,053,342	0.89	\$5,368,792	\$431,517	0.93	\$10,053,342	0.89	\$4,197,256	
2020	13	\$17,795	0.94	\$7,629,850	0.89	\$11,779,141	\$410,173	0.94	\$10,177,458	0.89	\$5,368,792	\$431,517	0.94	\$10,177,458	0.89	\$4,197,256	
2021	14	\$17,795	0.93	\$7,536,803	0.89	\$11,779,141	\$410,173	0.93	\$10,053,342	0.89	\$5,368,792	\$431,517	0.93	\$10,053,342	0.89	\$4,197,256	
2022	15	\$17,795	0.94	\$7,629,850	0.89	\$11,779,141	\$410,173	0.94	\$10,177,458	0.89	\$5,368,792	\$431,517	0.94	\$10,177,458	0.89	\$4,197,256	
2023	16	\$17,795	0.95	\$7,722,897	0.89	\$11,779,141	\$410,173	0.95	\$10,301,573	0.89	\$5,368,792	\$431,517	0.95	\$10,301,573	0.89	\$4,197,256	
2024	17	\$17,795	0.97	\$7,815,944	0.89	\$11,779,141	\$410,173	0.97	\$10,425,688	0.89	\$5,368,792	\$431,517	0.97	\$10,425,688	0.89	\$4,197,256	
2025	18	\$17,795	0.97	\$7,815,944	0.90	\$11,911,491	\$410,173	0.97	\$10,425,688	0.90	\$5,429,115	\$431,517	0.97	\$10,425,688	0.90	\$4,244,417	
2026	19	\$17,795	0.97	\$7,815,944	0.89	\$11,779,141	\$410,173	0.97	\$10,425,688	0.89	\$5,368,792	\$431,517	0.97	\$10,425,688	0.89	\$4,197,256	
2027	20	\$17,795	0.97	\$7,815,944	0.89	\$11,779,141	\$410,173	0.97	\$10,425,688	0.89	\$5,368,792	\$431,517	0.97	\$10,425,688	0.89	\$4,197,256	
Column NPV		\$264,751		\$115,291,339		\$175,363,473	\$6,102,342		\$153,787,126		\$79,928,572	\$6,419,889		\$153,787,126		\$62,487,193	
Total NPV						\$291,679,378					\$245,186,083					\$228,062,251	
Total Saving (30 yr)							\$ 46,493,295					\$ 63,617,127					
Saving / yr							\$ 2,324,665					\$ 3,180,856			,		
							yr.	mo.				yr.	mo.				
Payback Period (yr)							1	11				1	5		1		

City Hospital Building System Integration

Appendix xviii