Attachment D
Financial Analysis

Green Building Ordinance
REF110058

Attachment D
Financial Analysis for the Green Building Ordinance

I. Overview

Building Permit Fees

As drafted, the Green Building Ordinance will provide a two level Building Permit fee rebate to encourage sustainable building design practices that are above and beyond the minimums required. Those fee reductions are proposed at the following dollar amounts:

- Step 1 - $750
- Step 2 - $1,000

The ordinance calls for the Board of Supervisors to adopt a resolution establishing the rebate fees. This fee item will require a separate Board hearing and action.

Staffing

The Green Building Ordinance contains two new staff duties and responsibilities. First, RMA-Building Services staff will be responsible for reviewing Building Permit application materials to determine if the permit qualifies for incentives offered in the ordinance. In terms of applications using Part 11 of the California Building Code (CALGreen), staff will be responsible for determining eligibility of those applications for incentives. This can be done with minimal additional staff time as RMA - Building Services is already enforcing the CALGreen standards. For the purposes of determining whether a project qualifies for the incentives described in the ordinance when a third-party rating systems is used (such as LEED or GreenPoint), RMA - Building Services will require the applicant to provide evidence from a certified professional within the chosen rating system (at the applicant's expense). Staff will review the information provided by the applicant to determine if the information is sufficient to demonstrate that the application qualifies for an incentive. This review is expected to take a negligible amount of time.

Second, the Green Building Ordinance provides an incentive that provides the Building Official the opportunity to assign a staff person to coordinate review of Building Permit applications. This would be a new responsibility for Building staff. Coordination of Building Permit application review will likely involve the following new duties: 1) contacting other County Departments that are responsible for reviewing applications; 2) drafting a letter to the applicant if more information is necessary to complete the review; 3) potentially researching available information about the use of green products and technologies; and 4) meeting with the applicant and other Departments to aid in the review of responsive information. This new duty is estimated to take approximately four (4) hours of staff time per application on average.

County facilities and Capital Improvement Projects

The Green Building Ordinance requires the County of Monterey to design and construct new County-owned buildings and "Major Remodels" of County-owned buildings to standards that are more restrictive (thus resulting in a more efficient design)

than the minimum standards currently in place. The ordinance also requires on-site renewable energy generation for new County-owned buildings. For the purposes of financing it is important to make the distinction between "New County-owned buildings" and "Major Remodel of County-owned buildings". This distinction is important due to the ease with which green building designs and practices can be implemented in designing and constructing new building compared to the more difficult task of applying the same standards to a building that already exists. In reviewing the County's Capital Improvement Program, the majority of projects where green building standards will be applicable fall within the "Major Remodel" category rather than the "New building" category. The following analysis is based on review of case studies and information prepared by the United States Department of Energy, Cal Recycle, and numerous green building organizations.

New County-owned Buildings

In general, with proper planning and consideration, new buildings can be designed and constructed to meet green or sustainable design criteria at a cost per square foot that is expected of standard construction designs. In other words, new green buildings do not have to cost more. Also, "green buildings" are more efficient and less expensive to operate and maintain. Green buildings typically reduce the cost of utilities such as gas, electric, and water considerably. Green buildings have also been shown to reduce the rate of illnesses of occupants due to the improved indoor air quality and the typical use of natural light rather than artificial lighting. As a result of the comparable cost of construction, long-term savings in utility costs, and likely a reduction in employee absences due to illness, the fiscal impacts of designing new County-owned buildings to more sustainable or green standards is positive. Thus, it is expected that the County will benefit financially from this requirement. The generally accepted increase in building efficiency from the current minimum standards to the proposed minimum standards is thought to be at an amount that is 15% better or more efficient. The financial benefits may be off-set slightly due to the requirement to provide on-site renewable energy generation. Currently, given the costs of solar panels, related equipment, and construction costs, costs of providing on-site renewable energy generation are usually not fully paid back over the useful life of the project through lowered utility costs.

Major Remodel of County-owned Buildings

The ordinance defined "Major Remodel" as a project that involves two or more of the following:

1. Demolition and construction of 50 percent or more of the interior or exterior walls within a building;
2. A permit valuation that exceeds $100,000; or
3. Electrical, plumbing, mechanical, and structural repairs affecting an area of 5,000 square feet or more.

All of the benefits of green building that are described in the paragraph above dealing with new County-owned Buildings apply to Major Remodels of County-owned buildings with the exception of construction costs. It is not possible to assign an amount to the

additional costs of construction for major remodels due to the wide variety of circumstances and conditions that would influence those costs; however, with the financial benefits of a 15% overall reduction in utility costs and reduced employee absences due to illness, the potentially higher costs of construction will often be paid for in reduced operating and maintenance costs over the useful life of the project. Renewable energy generation is not required for major remodels.

II. Estimated Financial Impact

Building Permit Fees

In Fiscal Year (FY) 2011-12, the Building Department processed approximately 150 Building Permit applications that, if designed to the appropriate standards, could be eligible to receive Building Permit fee rebate incentives. This number is based on review of the RMA - Building Services summary of construction Activity Report for June 2012, Fiscal Year To Date (FYTD) information (See attached). The worst case scenario, in terms of financial impacts by way of reduced Building Permit fees, would assume that all 150 applications were designed to qualify for the Step 2 incentive.

Assuming a Step 2 rebate amount of $1,000 is applied to all 150 Building Permits the resulting loss in fees collected for Building Permit review would be $150,000 or a total reduction of approximately four percent (4%). This amount may vary from year to year.

A more realistic scenario, and thus more realistic financial impact, could be achieved by evenly dividing the 150 permits amongst the three potential scenarios. The potential scenarios or categories include:

1. Permits not qualifying for incentive;
2. Permits qualifying for Step 1 incentives; and
3. Permits qualifying for Step 2 incentives

(150 permits/3 categories = 50 permits/category)

There are no new financial impacts for permits that do not qualify for an incentive. Assuming 50 permits qualify for a Step 1 incentive at $750 the resulting fee reductions would be $37,500. Likewise, assuming 50 permits qualify for a Step 2 incentive at $1,000, the resulting fee reductions would be $50,000. Together the total financial impact from reduced building permit fees would be $87,500 or a total reduction of approximately 2.4 percent. The table below provides a summary of estimated reductions.

Table 1 – Building Permit Fees

	Not Qualified	Step 1 - $750	Step 2 - $1,000	Total cost
Worst Case	0	0	150	$150,000
Even Split	50	50	50	**$87,500**

Staffing

Attachment D
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As described in the overview, there are two new processes within the Green Building Ordinance that could affect work load of existing RMA-Building Services staff. The first duty of reviewing Building Permit applications to determine if they qualify for incentives, and at what level or step, will take an insignificant amount of time beyond the time spent on related efforts without the ordinance. The second process or duty of coordinating internal review of Building Permit applications is estimated to take approximately 4 hours of staff time per application on average. Carrying forward the Assumptions used in the Building Permit analysis, a worst case scenario assuming that all 150 permits qualify for incentives, the new duty is estimated to require 600 hours of staff time over the course of one (1) Fiscal Year (150 permits x 4 hours = 600). 600 hours equates to approximately 0.3 Full Time Equivalents (FTE). Under the even split scenario, the coordinator incentive can be applied to both the Step 1 and Step 2 incentives alike, so the total number of permits for the purposes of estimating the required staff time would be a combination of Step 1 and Step 2 (50 – Step 1 + 50 – Step 2 = 100 total). Assuming an estimated 4 hours per permit the total estimated staff time under this scenario is 400 hours or 0.2 FTE. Table 2 below provides a summary of estimated staff time necessary to implement the proposed ordinance.

Table 2 – Staff time

	Not Qualified	Qualified	Total Staff Hours	FTE
Worst Case	0	150	600	0.3
Even Split	50	100	**400**	**0.2**

Together, the estimated financial impacts of the Green Building Ordinance incentives are summarized in Table 3 below.

Table 3 – Total (Incentives)

	Reduction in fees	Total Staff Hours	FTE
Worst Case	$150,000	600	0.3
Even Split	**$87,500**	**400**	**0.2**

County facilities and Capital Improvement Projects

The Green Building Ordinance requires the County to design and construct all new County-owned buildings and Major Remodels of County-owned buildings to meet higher standards of green building and design than are currently required. The ordinance also requires installation of renewable energy generators for new County-owned buildings (not Major Remodels). From a financial standpoint, his requirement is completely different and independent from the analysis relating to the incentives offered to Building Permit applicants described above.

New County-owned Buildings

Constructing new County-owned buildings to meet increased building efficiency standards will save the County money in the long-term. It is difficult to quantify the savings with new County-owned buildings because constructing new County Buildings usually requires spending large amounts of money; however, the amount of money

needed to construct a building is not expected to be significantly different given the new criteria. In fact, there are several examples of public buildings that were constructed to meet levels that exceed the proposed Green Building standards minimum levels at a cost that is less per square foot than typical construction of a similar nature. The Portola Hotel and Spa in Monterey and the Chartwell School in Fort Ord are two examples of large facilities that have achieved LEED ratings in Monterey County. Although it is not currently part of the budget, new County-owned buildings would have operating and maintenance costs. If the County were to construct County-owned buildings using the existing standards and criteria, the long-term operating costs (including utilities) and maintenance costs would generally be around 15% higher than the same costs with a "greener" building. For the purposes of providing an example, if the County built a new facility with an annual utility cost of $10,000 and an annual maintenance cost of $20,000 the total annual cost to the County for operation and maintenance of that structure would be $30,000 (a very small cost estimate considering the costs currently incurred with most County-owned buildings). A new Green building, at a the minimum level required by the Green Building Ordinance (equivalent to Step 1 incentive levels), would likely require around 15% less in operating and maintenance costs over the useful life of the project. So the same building described above would require $25,500 in annual operating costs, a savings of $4,500 that the County would have otherwise been required to spend annually. A building with a useful life of 50 years would save $225,000 in operating and maintenance costs ($4,500 x 50).

Major Remodels of County-owned Buildings

Applying green building standards to remodels is often more difficult and expensive than applying the same standards to new construction. The increased expense can be accounted for in the existing capital improvement process by either; 1) estimating and planning for costs of improvements understanding the new requirements; or 2) in the event that financing is fixed, then the scope of the project may need to be reduced to match the available funding. Outside of the cost of construction, the same future financial benefits described under the new County-owned Buildings discussion also apply to Major remodels. Using the same example regarding utility and maintenance costs described above, a Major Remodel with a useful life of 50 years would save the County $225,000 in financial obligations over that time. This amount is likely to cover all or more of the increased costs of construction from the use of green building standards.

On-site renewable Energy Generation

In 2010, Natividad Medical Center (NMC) prepared a financial analysis to determine the feasibility of installing solar panels at the hospital (see attached). The test scenario included a 500 kilowatt (kW) photovoltaic system (PV system). At that time a project that size would cost an estimated $2.3 million. Through rebates and utility savings over the life of the project it was estimated that the County could recover all but $600,000 of that $2.3 million. Market trends are showing the cost of PV systems declining with the cost of electricity rising which may further reduce the gap in the future. Similar results for PV systems have bee found by County Public Works staff. This requirement is expected to increase the cost of constructing new buildings by about 25% of the total cost of the renewable energy project.

III. Conclusion

The Green Building Ordinance is estimated to result in the following financial impacts:

- Due to the Building Permit fee rebate incentive, there will be an estimated reduction in Building Permit fees received of $87,500 annually;
- Due to the Building Permit process coordinator incentive, there will be an estimated increase in duties and responsibilities of RMA - Building Services staff of approximately 400 hours per year or 0.2 FTE;
- Due to the requirement for newly constructed County-owned buildings to meet or exceed CALGreen Tier 1 standards, it is estimated that the County will save an unknown amount of money due to reduced utility and maintenance costs over the life of the project; and
- Due to the requirement for Major Remodels to be constructed to meet or exceed CALGreen Tier 1 standards, there will be an unknown increase in construction costs of Major Remodel projects balanced by a long-term savings due to reduced utility and maintenance costs over the life of the project.
- Due to the requirement for the County to provide on-site renewable energy generation in connection with new County-owned buildings, there will be an increase in project costs for construction with a payback over the life of the project, through reduced utility expenses, that is expected to recover approximately 75% of this additional cost.

COUNTY OF MONTEREY
BUILDING SERVICES DEPARTMENT
SUMMARY OF CONSTRUCTION ACTIVITY

June 2012

Permits Issued During The Month

Permit Type	Number of Permits	Number of Permits FYTD	Permit Fees*	Permit Fees* FYTD	Construction Valuations	Construction Valuations FYTD
Residential-Plumb/Elec/Mech	22	490	$3,768	$99,333	$34,791	$841,727
Commercial-Plumb/Elec/Mech	9	124	$3,327	$42,110	$84,500	$912,700
Single Family Dwelling New	15	137	$208,336	$1,583,464	$7,936,121	$78,110,760
Two Family Dwelling New	0	3	$0	$29,408	$0	$557,199
Hospitals and Other Institutions	0	2	$0	$7,955	$0	$781,956
Office/Bank/Professional Bldg	2	7	$171	$15,428	$2,000,000	$4,337,264
Residential Addition/Alteration	41	511	$80,194	$1,189,315	$1,793,278	$34,595,833
Re-roof	32	399	$5,565	$71,250	$248,144	$2,097,258
Residential Remodel	9	126	$13,360	$180,401	$204,349	$3,499,150
Retaining Wall	0	8	$0	$16,726	$0	$716,009
Deck	3	19	$1,644	$13,333	$10,325	$212,198
Pool	0	5	$0	$9,340	$0	$140,000
Garage/Carport	0	9	$0	$16,330	$0	$216,820
Structure other than Building	4	22	$5,560	$31,203	$118,193	$635,797
Simple Permits	0	3	$0	$501	$0	$3,200
Miscellaneous	3	21	$2,760	$33,933	$86,489	$1,179,113
Grading	4	48	$11,554	$111,425	$160,000	$712,800
Industrial Building	0	7	$0	$152,639	$0	$4,071,501
Commercial New	0	9	$0	$21,667	$0	$512,532
Commercial Addition/Alteration	13	134	$33,500	$267,685	$2,711,796	$13,896,173
Demolition Permits	1	81	$328	$25,726	$0	$269,350
Totals	**158**	**2165**	**$370,067**	**$3,685,172**	**15,387,986**	**$160,927,090**
Budget Forecast $ Amount	-	-	**$326,401**	**$3,057,782**	-	-
Adopted Budget $ Amount	-	-	-	**$3,057,781**	-	-

Inspections:

Total Number of Inspections: 824 Stops: 515 Average Inspections Per work day: 39

	Current Month		Year to Date	
	# Permits	Amount	# Permits	Amount
Traffic Impact Fees:				
Traffic Impact Carmel Valley:	0	$0	21	$333,868
Traffic Impact Hwy 1/ Santa Lucia:	0	$0	12	$10,908
TAMC:	4	$89,335	74	$314,481
Traffic Impact Pasadera	0	$0	0	$0
Fire Districts:				
Cypress:	1	$10	36	$13,851
Carmel Valley:	0	$0	11	$2,166
Monterey County Regional:	5	$5,158	86	$145,958
North County:	3	$18,064	49	$41,286
Aromas:	0	$0	2	$1,464
Spreckles:	0	$0	1	$403
Fire Admin Fee:	8	$2,580	128	$18,665
State Fees:				
Strong Motion Residential:	115	$1,067	1703	$10,555
Strong Motion Commercial:	25	$823	279	$3,606
Strong Motion Uncategorized:	3	$9	48	$2,163
Surcharges:				
Ca. Bldg. Standards Com.:	139	$674	2012	$6,371
Technology Implementation:	140	$22,428	2012	$220,846
General Plan Implementation:	59	$1,081	767	$15,337
Credit Card:	54	$767	880	$10,357
Permit Credit Incentives:				
Alternative Energy Incentive:	10	<$8,250>	127	<$96,750>

* Not including Impact, State, other Agency, and Surcharge fees

Natividad Medical Center Photovoltaic Solar Panel Financial Analysis

Initial Costs

According to the Solar Electricity Global Benchmark Price Indices May 2010 Survey, the benchmark installed price for a 500 peak kilowatt system is $2,256,616. California labor wages and OSHPD requirements will probably add to this price, but for the purpose of this analysis we will use the benchmark figure.

Incentives

Customers with solar systems between 50 kW and 1 MW must apply for the Performance Based Incentive (PBI) structure. PBI incentives are a five-year stream of fixed monthly payments determined by the actual output of the system, as metered and reported to the utility. After January 1, 2010, all systems greater than 30 kW must choose the Performance Based Incentive structure. The PBI incentive path is available at any time to any size system.

Incentives are reduced by steps as solar generation capacity is added to the grid. Table 1 below shows the current step and the capacity remaining before the next step is triggered.

Last updated 5/21/2010

Administrator	Customer Class	Current Step	Initial MW in Step	Unused MW from Previous Steps	Revised Total MW in Step	Issued Conditional Reservation Letters (MW)	MW Remaining	MW Under Review
PG&E	Residential	7	31.00	0.04	31.04	4.24	26.80	3.70
	Non-Residential	7	62.90	0.00	62.90	0.74	62.16	22.24

Table 1

As is reflected in table 2 below, the current incentive is $0.19 per kilowatt-hour. Residential and commercial incentives are the same price in each step; however, local governments and other tax-exempt organizations receive a slightly higher incentive because we cannot qualify for Federal Investment Tax Credits on our solar systems.

			PBI Payments (per kWh)	
			Non-Residential	
Step	Statewide MW in Step	Residential	Commercial	Government/ Non-Profit
1	50	n/a	n/a	n/a
2	70	$2.50	$0.39	$0.50
3	100	$2.20	$0.34	$0.46
4	130	$1.90	$0.26	$0.37
5	160	$1.55	$0.22	$0.32
6	190	$1.10	$0.15	$0.26
7	215	$0.65	$0.09	$0.19
8	250	$0.35	$0.05	$0.15
9	285	$0.25	$0.03	$0.12
10	350	$0.20	$0.03	$0.10

Table 2

J. Kari

Operation and Maintenance

Solar panel systems are described in terms of peak watt capacity, the maximum potential power output of the system. Because solar panels do not generate electricity when the sun is not out, actual production is much less than peak capacity. Appendix 1 shows graphically the typical daily electricity output of a photovoltaic solar system as a percentage of peak watt capacity. Appendix 2 reflects production on a monthly basis.

Life expectancy for a photovoltaic solar array is twenty years. Panel degradation is expected to result in a 1% per year efficiency loss. Routine maintenance costs are relatively low, but vandalism adds to the total, leading to an estimate of $9,000 per year for maintenance.

Net Present Value

Although solar systems do not generate electricity at peak capacity at all times, the times power output is highest is also when the price of electricity from the grid is highest. Solar panels also help defray the costs associated with maximum demand and peak demand.

Appendix 3 represents forecasted monthly savings the first year after installation of a 500 peak kilowatt system with the following pricing assumptions:

May 1 through October 31 pricing

Peak price per kilowatt-hour - $0.154

Partial peak price per kilowatt-hour - $0.103

Off peak price per kilowatt-hour - $0.081

Peak demand price per kilowatt - $10.97

Partial peak demand price per kilowatt - $2.53

Maximum demand price per kilowatt - $5.85

November 1 through April 30 pricing

Partial peak price per kilowatt-hour - $0.089

Off peak price per kilowatt-hour - $0.077

Partial peak demand price per kilowatt - $0.67

Maximum demand price per kilowatt - $6.18

Assuming a one percent per year degradation of power production and excluding maintenance costs, the net present value of a 500 kilowatt system with five years of PBI incentives, at a three percent discount rate is $1,646,757.

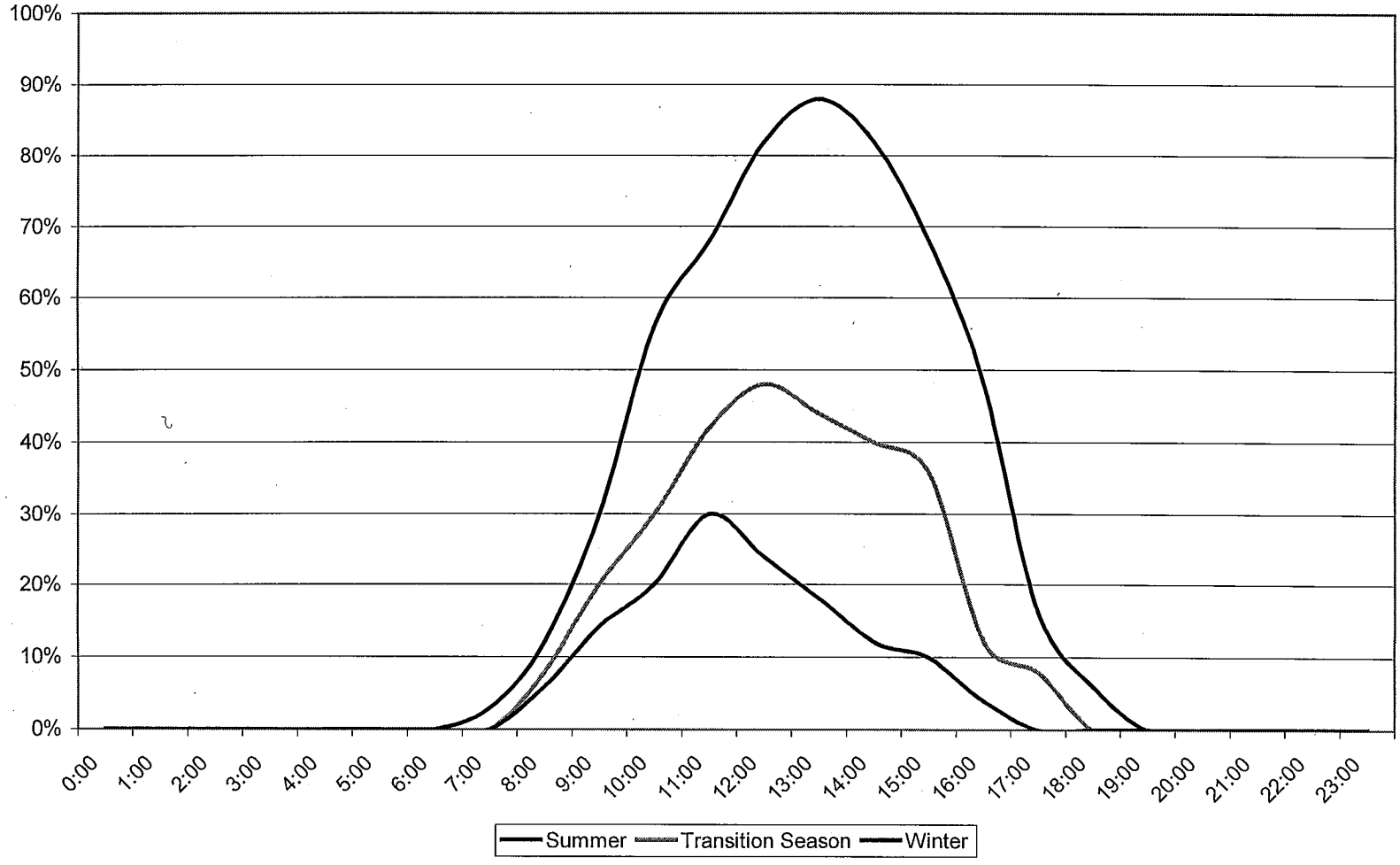
Conclusion

The net present value is ≈ $610,000 less than the cost of installing the system. The cost of solar installations is falling at about 4% per year. Regression analysis shows electricity prices are rising at ≈ 2.3% per year. See appendix 4 for a graph of electricity price trends. If these trends continue and absent additional incentives, the project should be revisited in 4 to 5 years.

J. Kari

Appendix 1

Daily Solar Panel Production By Season



Appendix 2

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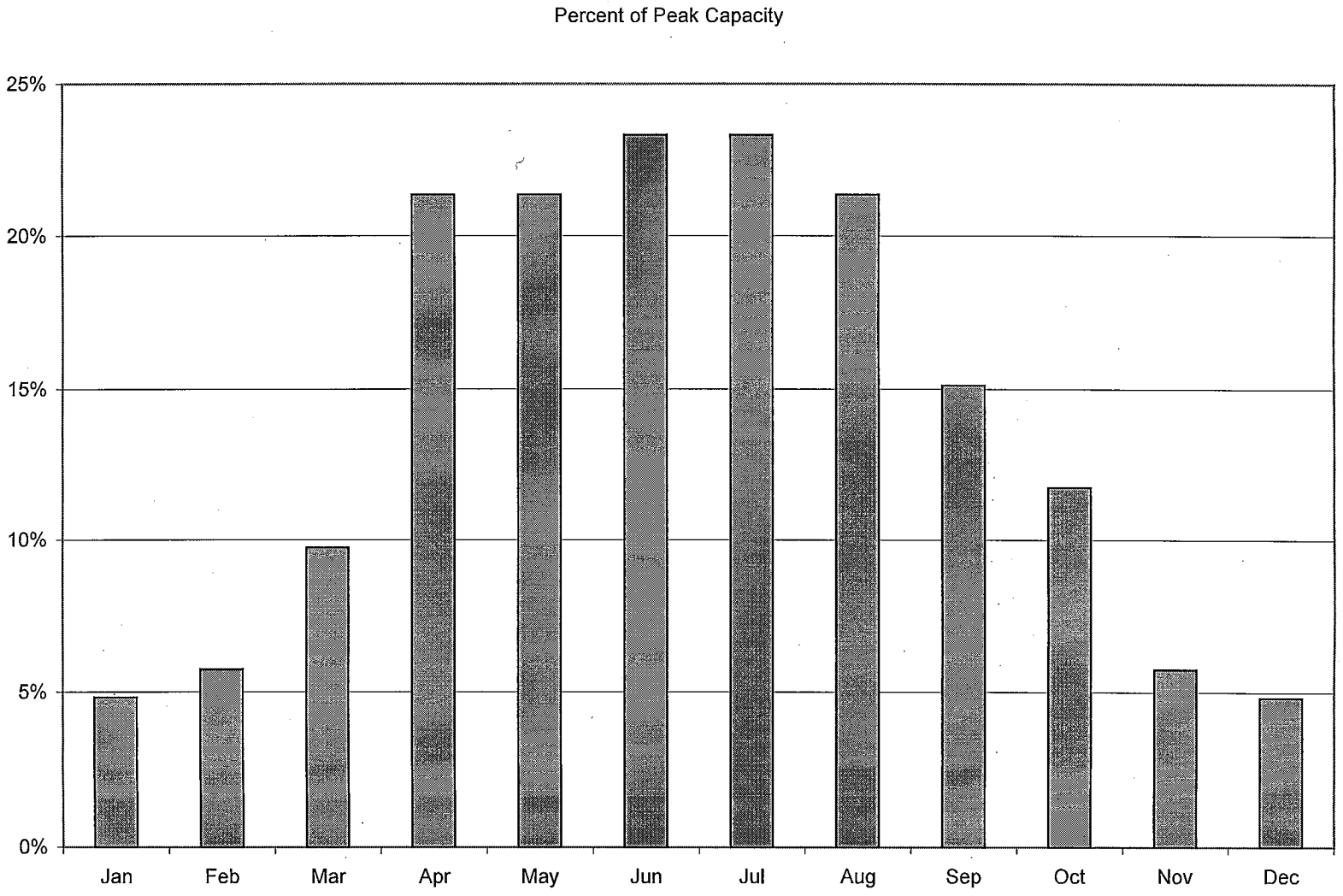

Appendix 3

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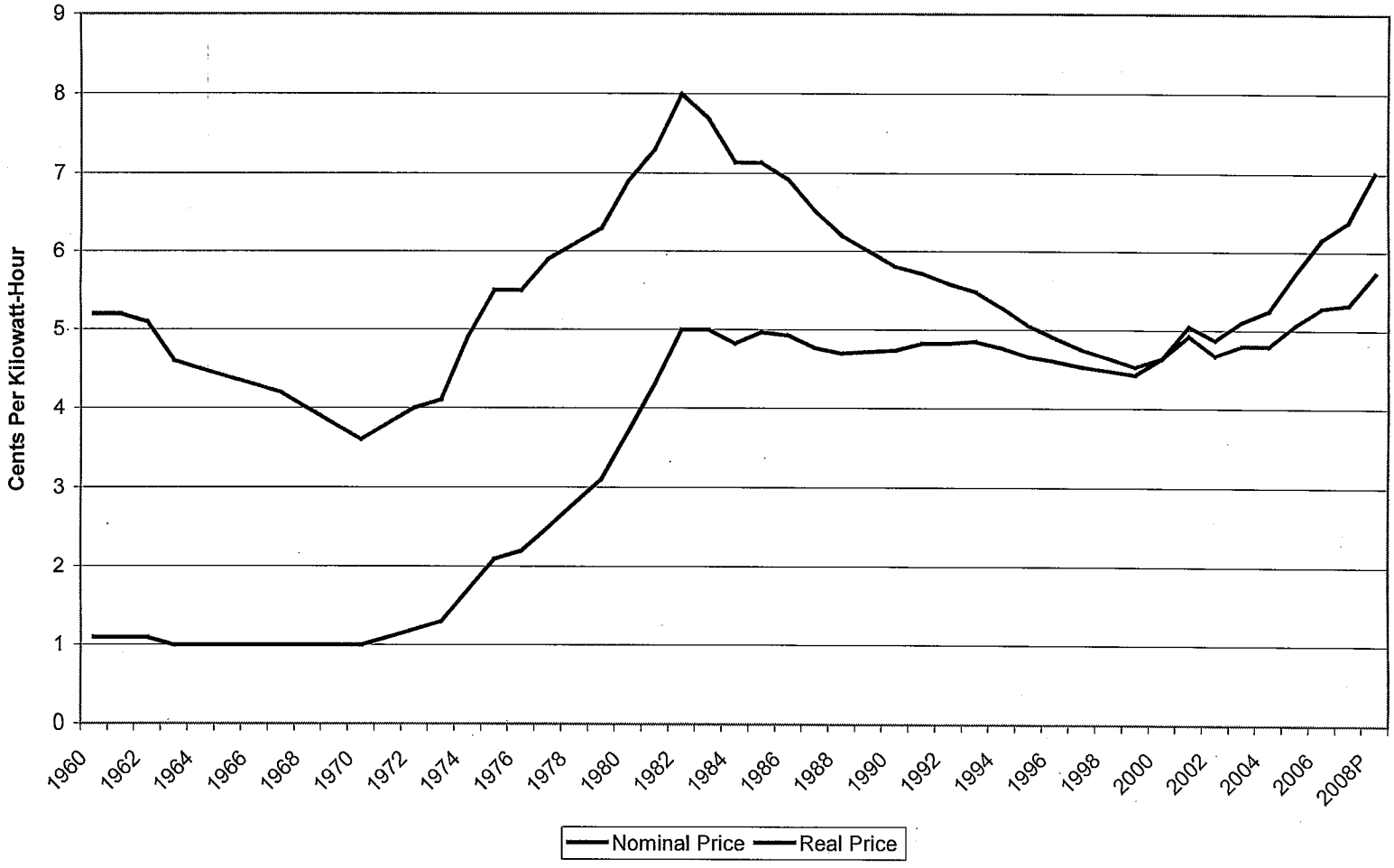
	January			February			March			April			May			June		
	KWH	Weekday	Weekend	KWH	Weekday	Weekend	KWH	Weekday	Weekend	KWH	Weekday	Weekend	KWH	Weekday	Weekend	KWH	Weekday	Weekend
7:00	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	15	1.215	1.22
8:00	20	$ 1.54	$ 1.54	30	$ 2.31	$ 2.31	40	$ 3.08	$ 3.08	60	$ 4.62	$ 4.62	60	$ 6.18	$ 4.86	60	$ 6.18	$ 4.86
9:00	60	$ 5.34	$ 4.62	70	$ 6.23	$ 5.39	110	$ 9.79	$ 8.47	120	$ 10.68	$ 9.24	120	$ 12.36	$ 9.72	150	$ 15.45	$ 12.15
10:00	90	$ 8.01	$ 6.93	100	$ 8.90	$ 7.70	120	$ 10.68	$ 9.24	240	$ 21.36	$ 18.48	240	$ 24.72	$ 19.44	280	$ 28.84	$ 22.68
11:00	130	$ 11.57	$ 10.01	150	$ 13.35	$ 11.55	180	$ 16.02	$ 13.86	320	$ 28.48	$ 24.64	320	$ 32.96	$ 25.92	340	$ 35.02	$ 27.54
12:00	100	$ 8.90	$ 7.70	120	$ 10.68	$ 9.24	210	$ 18.69	$ 16.17	360	$ 32.04	$ 27.72	360	$ 55.44	$ 29.16	410	$ 63.14	$ 33.21
13:00	80	$ 7.12	$ 6.16	90	$ 8.01	$ 6.93	140	$ 12.46	$ 10.78	430	$ 38.27	$ 33.11	430	$ 66.22	$ 34.83	440	$ 67.76	$ 35.64
14:00	60	$ 5.34	$ 4.62	60	$ 5.34	$ 4.62	130	$ 11.57	$ 10.01	360	$ 32.04	$ 27.72	360	$ 55.44	$ 29.16	410	$ 63.14	$ 33.21
15:00	40	$ 3.56	$ 3.08	50	$ 4.45	$ 3.85	120	$ 10.68	$ 9.24	320	$ 28.48	$ 24.64	320	$ 49.28	$ 25.92	340	$ 52.36	$ 27.54
16:00	0	$ -	-	20	$ 1.78	1.54	80	$ 7.12	6.16	240	$ 21.36	18.48	240	$ 36.96	19.44	240	$ 36.96	19.44
17:00	0	$ -	-	0	$ -	-	40	$ 3.56	3.08	80	$ 7.12	6.16	80	$ 12.32	6.48	80	$ 12.32	6.48
18:00	0	$ -	-	0	$ -	-	0	$ -	-	30	$ 2.67	2.31	30	$ 3.09	2.43	30	$ 3.09	2.43
	580	$ 51	$ 45	690	$ 61	$ 53	1170	$ 104	$ 90	2560	$ 227	$ 197	2560	$ 355	$ 207	2795	$ 385	$ 226
	Max		$ 803	Max		$ 927	Max		$ 1,112	Max		$ 1,978	Max		$ 2,516	Max		$ 2,574
	Partial Peak		$ 87	Partial Peak		$ 101	Partial Peak		$ 121	Partial Peak		$ 214	Partial Peak		$ 911	Partial Peak		$ 1,038
													Peak		$ 4,718	Peak		$ 4,828
	$		2,409	$		2,666	$		4,338	$		8,736	$		17,673	$		18,731

	July			August			September			October			November			December		
	KWH	Weekday	Weekend	KWH	Weekday	Weekend	KWH	Weekday	Weekend	KWH	Weekday	Weekend	KWH	Weekday	Weekend	KWH	Weekday	Weekend
7:00	15	1.215	1.22	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
8:00	60	$ 6.18	$ 4.86	60	$ 6.18	$ 4.86	40	$ 4.12	$ 3.24	40	$ 4.12	$ 3.24	30	$ 2.31	$ 2.31	20	$ 1.54	$ 1.54
9:00	150	$ 15.45	$ 12.15	120	$ 12.36	$ 9.72	90	$ 9.27	$ 7.29	100	$ 10.30	$ 8.10	70	$ 6.23	$ 5.39	60	$ 5.34	$ 4.62
10:00	280	$ 28.84	$ 22.68	240	$ 24.72	$ 19.44	180	$ 18.54	$ 14.58	150	$ 15.45	$ 12.15	100	$ 8.90	$ 7.70	90	$ 8.01	$ 6.93
11:00	340	$ 35.02	$ 27.54	320	$ 32.96	$ 25.92	240	$ 24.72	$ 19.44	210	$ 21.63	$ 17.01	150	$ 13.35	$ 11.55	130	$ 11.57	$ 10.01
12:00	410	$ 63.14	$ 33.21	360	$ 55.44	$ 29.16	280	$ 43.12	$ 22.68	240	$ 36.96	$ 19.44	120	$ 10.68	$ 9.24	100	$ 8.90	$ 7.70
13:00	440	$ 67.76	$ 35.64	430	$ 66.22	$ 34.83	300	$ 46.20	$ 24.30	210	$ 32.34	$ 17.01	90	$ 8.01	$ 6.93	80	$ 7.12	$ 6.16
14:00	410	$ 63.14	$ 33.21	360	$ 55.44	$ 29.16	280	$ 43.12	$ 22.68	180	$ 27.72	$ 14.58	60	$ 5.34	$ 4.62	60	$ 5.34	$ 4.62
15:00	340	$ 52.36	$ 27.54	320	$ 49.28	$ 25.92	240	$ 36.96	$ 19.44	180	$ 27.72	$ 14.58	50	$ 4.45	$ 3.85	40	$ 3.56	$ 3.08
16:00	240	$ 36.96	19.44	240	$ 36.96	19.44	90	$ 13.86	7.29	60	$ 9.24	4.86	20	$ 1.78	1.54	0	$ -	-
17:00	80	$ 12.32	6.48	80	$ 12.32	6.48	60	$ 9.24	4.86	40	$ 6.16	3.24	0	$ -	-	0	$ -	-
18:00	30	$ 3.09	2.43	30	$ 3.09	2.43	15	$ 1.55	1.22	0	$ -	-	0	$ -	-	0	$ -	-
	2795	$ 385	$ 226	2560	$ 355	$ 207	1815	$ 251	$ 147	1410	$ 192	$ 114	690	$ 61	$ 53	580	$ 51	$ 45
	Max		$ 2,574	Max		$ 2,516	Max		$ 1,755	Max		$ 1,229	Max		$ 927	Max		$ 803
	Partial Peak		$ 1,038	Partial Peak		$ 911	Partial Peak		$ 709	Partial Peak		$ 608	Partial Peak		$ 101	Partial Peak		$ 87
	Peak		$ 4,828	Peak		$ 4,718	Peak		$ 3,292	Peak		$ 2,304						
	$		18,640	$		17,968	$		12,343	$		9,307	$		2,772	$		2,409

Appendix 4

J. Kari

Electricity Price Trend



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