# MGA Campus Building Greenhouse Gas Emissions Summary



# Prepared for MGA Entertainment

Date **4/16/2014** 

Prepared by



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<u>Disclaimer</u>: Brummitt Energy Associates, Inc. makes no guarantee that energy savings will be achieved as estimated, except that services or work product were performed pursuant to generally accepted standards of practice in effect at the time of performance. Any recommendations which may be made are for the consideration of the architect and engineers; they are not to be used instead of, or as a replacement for, licensed design. Many factors in the construction and operation of the building will affect the energy use, which are outside of Brummitt's ability to control. This report is based on our understanding of the building design at this time. These results are subject to change with changes to the current design.

# 1. Executive Summary

This report summarizes the results of a whole building energy model to estimate reduction in greenhouse gas emissions relative to a Business as Usual (BAU) case for the proposed MGA Campus.

The BAU case is defined by Title 24-2008. The Proposed building will be built at a minimum to Title 24-2013 standards.

The project target is to demonstrate a GHG emissions reduction of at least 20% compared to the BAU case. The energy model results confirm that GHG emissions can be reduced by an estimated 20% by designing to the following targets:

- Meet the Title 24-2013 standards that will be applicable to this project
- Design the existing building to meet Title 24-2013 standards with some additional energy efficiency improvements consistent with a LEED v3 Certified project
- Install a PV system of minimum size of 175 kW DC.

Percent reduction in GHG emissions associated with different sized renewable energy systems is shown in this report for reference.

## Estimated lbs CO2e/yr

|                | <b>Business as Usual</b> | Proposed  |
|----------------|--------------------------|-----------|
| Nonresidential | 3,516,604                | 3,061,940 |
| Residential    | 4,704,878                | 3,935,085 |
| Site           | 1,095,032                | 621,436   |
| Subtotal       | 9,316,514                | 7,618,461 |
| PV             | 0                        | -166,793  |
| Total          | 9,316,514                | 7,451,668 |

Reduction = (9,316,514 - 7,451,668) / 9,316,514 = 20%

# 2. Greenhouse Gas Emissions Assumptions

This section summarizes the assumptions used for calculating GHG emissions. The assumptions are consistent throughout this report.

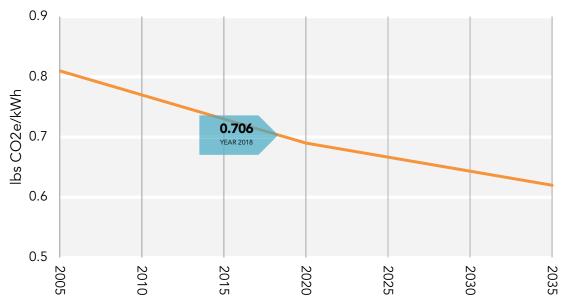
The source of GHG emissions values are from SCAG EIR scenarios, as modeled by Calthorpe Associates' using the Rapid Fire model.

http://rtpscs.scag.ca.gov/Documents/peir/2012/draft/2012dPEIR AppendixE GreenhouseGasAssumptions.pdf

Table 9 from Appendix E is reproduced below.

|                                      | 2005 | 2020 | 2035 |
|--------------------------------------|------|------|------|
| Electricity Emissions<br>(lbs/kWh)   | 0.81 | 0.69 | 0.62 |
| Natural gas emissions<br>(lbs/therm) | 11.7 | 11.7 | 11.7 |

Assuming a linear trend between years, GHG emissions rate from electricity consumption is estimated to be 0.706 lbs CO2e/kWh for the year 2018 (estimated buildout year).



# **Electricity Emissions (lbs CO2e/kWh)**

Based on this data, multipliers for greenhouse gas (GHG) emissions used in this analysis are as follows:

- Electricity: 0.706 lbs CO2e / kWh
- Natural gas: 11.7 lbs CO2e / therm

# 3. Summary of Business as Usual (BAU)

#### **Title 24-2008 Prescriptive Requirements**

The following table is a summary of the <u>Title 24-2008 Prescriptive Requirements for Climate Zone 9</u>, which defines BAU for this project.

|               | Residential  | Nonresidential  |
|---------------|--|---|
| Walls         | • Wood frame U=0.059                                     | <ul> <li>Metal frame U = 0.062</li> <li>Mass walls U=0.690</li> </ul> |
|               |  | <ul> <li>Wass walls 0=0.070</li> <li>Wood frame U=0.059</li> </ul>    |
| Roof          | • U=0.028  | • U=0.039, Cool roof  |
|               |  | • 3-year aged solar reflectance = 0.55                                |
|               |  | <ul> <li>Thermal emittance = 0.75</li> </ul>                          |
| Floor/Soffit  | • U=0.039  | • U=0.071   |
| Slab on Grade | • F=0.73   | • F=0.73  |
| Windows       | <ul> <li>Approx 15% WWR</li> </ul>                       | <ul> <li>Approx 35% WWR</li> </ul>                                    |
|               | • U=0.47   | • U=0.77  |
|               | • SHGC (North) = 0.61                                    | • SHGC (North) = 0.61   |
|               | • SHGC (North) = 0.40                                    | • SHGC (North) = 0.34   |
| Skylights     | • N/A  | Approx 3% SRA   |
|               |  | • U=1.11  |
|               |  | • SHGC=0.40   |
| HVAC          | <ul> <li>Heat Pump, 13 SEER</li> </ul>                   | <ul> <li>Heat Pump, 13 SEER (small nonres)</li> </ul>                 |
|               |  | <ul> <li>Packaged VAV units: 9.5 EER</li> </ul>                       |
|               |  | <ul> <li>Boiler, 80% for reheat</li> </ul>                            |
|               |  | <ul> <li>Constant speed HHW pumping</li> </ul>                        |
| Lighting      | <ul> <li>Residential units – not regulated</li> </ul>    | <ul> <li>Whole building office: 0.85 w/sf</li> </ul>                  |
|               | <ul> <li>Corridors for residential: 0.60 w/sf</li> </ul> |   |
| Site Lighting | <ul> <li>Covered Parking: 0.3 w/sf</li> </ul>            | Covered Parking: 0.3 w/sf   |
|               | <ul> <li>Surface parking: 0.092 w/sf</li> </ul>          | Surface parking: 0.092 w/sf   |
| Domestic HW   | • 80% Gas  | • Electric, EF = 0.93   |
| Renewable     | • None   | None  |
|               |  |   |

#### **BAU Results**

A project built to the standards summarized on the previous page, and using Title 24-2008 ACM Performance energy modeling guidelines is estimated to consume:

|                | kWh/yr    | Therms/yr | lbs CO2e/yr |
|----------------|-----------|-----------|-------------|
| Nonresidential | 4,796,311 | 11,146    | 3,516,604   |
| Residential    | 5,245,599 | 85,597    | 4,704,878   |
| Site           | 1,551,037 | 0         | 1,095,032   |
| Subtotal       |           |           | 9,316,514   |
| PV             |           |           |             |
| Total          |           |           | 9,316,514   |

Total GHG emissions of BAU design are estimated to be 9,316,514 tons CO2e/yr.

# 4. Summary of Proposed Project

#### **Proposed Project Features**

The project will be built to comply with, at a minimum, the Title 24-2013 energy code requirements. The major Proposed project features are summarized in the table below. All items are consistent with the Title 24-2013 Prescriptive requirements unless marked with an asterisk, which indicates that higher efficiency products are planned. These "higher efficiency" items were selected by the project team to help support a planned LEED certification for the existing building.

|               | Residential  | Nonresidential   |
|---------------|--|--|
| Walls         | <ul> <li>Wood frame U=0.059</li> </ul>   | • Metal frame U = 0.062  |
|               |  | <ul> <li>Mass walls U=0.690</li> </ul>   |
|               |  | • Wood frame U=0.059   |
| Roof          | • U=0.028, Cool roof   | • U=0.039, Cool roof   |
|               | <ul> <li>3-year aged reflectance = 0.63</li> <li>Thermal emittance = 0.75</li> </ul> | <ul> <li>3-year aged solar reflectance = 0.63</li> <li>Thermal emittance = 0.75</li> </ul> |
| Floor/Soffit  | • U=0.071  | • U=0.071  |
| Slab on Grade | • F=0.73   | • F=0.73   |
| Windows       | Approx 15% WWR   | Approx 35% WWR   |
|               | • U=0.46   | • U=0.41   |
|               | • SHGC (All) = 0.26  | • SHGC (All) = 0.26  |
| Skylights     | • N/A  | Approx 3% SRA  |
|               |  | • U=0.58   |
|               |  | • SHGC=0.25  |
| HVAC          | Heat Pump, 14 SEER   | <ul> <li>Heat Pump, 14 SEER (small nonres) with<br/>economizers</li> </ul>                 |
|               |  | • (*) High efficiency water-cooled   |
|               |  | centrifugal chillers, VFD, NPLV=0.34   |
|               |  | • (*) Primary-variable CHW pumping   |
|               |  | CHW/HW VAV units   |
|               |  | CHW/HW fan coils with economizers  |
|               |  | • Boiler, 80% for reheat   |
|               |  | • (*) Variable speed HHW pumping   |
|               |  | Fault Detection & Diagnostics  |
| Lighting      | <ul> <li>Residential units – not regulated</li> </ul>                                | <ul> <li>Whole building office: 0.80 w/sf</li> </ul>                                       |
|               | <ul> <li>Corridors for residential: 0.60 w/sf</li> </ul>                             |  |
|               | Occ. sensors on all res. corridor lighting   |  |
| Site Lighting | <ul> <li>Covered Parking: 0.2 w/sf</li> </ul>  | Covered Parking: 0.2 w/sf  |
|               | <ul> <li>Surface parking: 0.090 w/sf</li> </ul>                                      | • Surface parking: 0.090 w/sf  |
|               | <ul> <li>Occupancy sensors - garage lighting</li> </ul>                              | <ul> <li>Occupancy sensors - garage lighting</li> </ul>                                    |
| Domestic HW   | • 80% Gas  | • Electric, EF = 0.93  |
| Renewable     | None   | • (*) Minimum 175 kW DC PV system  |
| /             | 1 . 1  |  |

(\*) Items marked with an asterisk are proposed improvements beyond the Title 24-2013 Prescriptive baseline requirements. These "higher efficiency" items were selected by the project team to help support a planned LEED certification for the existing building.

## **Proposed Project Results**

A project built to the standards summarized on the previous page, using the same energy modeling methodologies as described for the BAU case, is estimated to consume:

|                | kWh/yr    | Therms/yr | lbs CO2e/yr |
|----------------|-----------|-----------|-------------|
| Nonresidential | 4,235,786 | 6,109     | 3,061,940   |
| Residential    | 4,156,119 | 85,544    | 3,935,085   |
| Site           | 880,221   | 0         | 621,436     |
| Subtotal       |           |           | 7,618,461   |
| PV             | -236,250  |           | -166,793    |
| Total          |           |           | 7,451,668   |

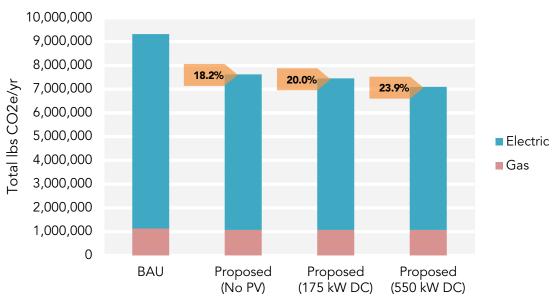
Total GHG emissions of Proposed design are estimated to be 7,451,668 tons CO2e/yr.

Reduction below BAU = (9,316,514 - 7,451,668) / 9,316,514 = 20%.

#### Summary of PV Benefit

The following chart shows the percent reduction in GHG gas emissions with three varying PV scenarios: No PV, 175 kW DC, and 550 kW DC.

- 175 kW DC is chosen as it represents the minimum required to achieve 20% GHG emissions reductions relative to BAU.
- 550 kW DC is chosen as it represents a conservative prediction of what could reasonably fit on the roof.



Percent GHG Reduction vs PV Size

- Without PV, GHG emissions reduction is estimated at 18.2%
- With 175 kW DC PV, GHG emissions reduction is estimated at 20%
- With 550 kW DC PV, GHG emissions reduction is estimated at 23.9%

# Appendix A: Energy Modeling Summary Output

The following attachments are the energy model outputs (UTIL-1 Summary) for:

- 1) Residential areas
- 2) Nonresidential areas
- 3) Site (parking garage and site lighting)

## **Nonresidential Areas**

| Proper Name     Date       MCAC Campus - Nonresidential     2492.014       Step 1     ANNUAL TOV ENERGY USE (kBur/sqft-yr)     Adjusted TOV Energy Use       ENERGY COMPONENT     Standard     Proposed       Space Cooling     124.76     42.33       Indoor Fans     44.69     46.72       Heat Rejection     0.00     21.13     21.13       Domestic Hot Water     27.89     0.00       TorALS:     339.27     34.63       Process Lighting     0.00     21.13       Process Lighting     0.00     0.00       TorALS:     339.27     34.637       Average 2pm - 5pm     Standard     Proposed       Pask Demand (kW)     1.44     Proposed       1.424 0     1.44     Proposed       1.424 0     1.44     1.144       Pask Demand (kW)     Standard     Proposed       Space Heating     53.77     34.637       Space Heating     6.637     0.00       Space Heating     6.637     0.00       Space Cooling     1.344     1.144       Porposed     Energing analysis that uses The 24       Pask Demand (kW)     1.244     Proposed       Space Heating     6.537     0.00       Space Heating     6.537     <  | Savings By Design UTILITY INCENTIVE WORKSHEET UTIL-1   |                      |               |               |                  |                      |                          |      |
|--|--|----------------------|---------------|---------------|------------------|----------------------|--------------------------|------|
| 40/2014           Standard         Proposed         Margin           Standard         Proposed         Margin           Standard         Proposed         Margin           Standard         Proposed         Margin         Standard         Proposed           Standard         Proposed         Margin         Standard         Proposed           Colspan="2">Colspan="2">Standard         Proposed           Colspan="2">Colspan="2">Colspan="2">Colspan="2"           Colspan="2"         Colspan="2"         Colspan="2"           Colspan="2"         Colspan="2"         Colspan="2"           Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"           Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan= Colspan="2" <th c<="" th=""><th></th><th>9</th><th></th><th></th><th></th><th></th><th>Date</th></th>  | <th></th> <th>9</th> <th></th> <th></th> <th></th> <th></th> <th>Date</th>   |                      | 9             |               |                  |                      |                          | Date |
| ENERGY COMPONENT       Standard       Proposed       Marcin         Space Heating $7.04$ $3.81$ $3.22$ $3.81$ $3.22$ Space Cooling $124.78$ $42.33$ $62.43$ $62.43$ Heat Rejection $0.00$ $21.13$ $22.13$ $62.43$ Domestic Hot Water $27.88$ $72.88$ $0.00$ Domestic Hot Water $27.88$ $72.39$ $0.00$ Process $44.68$ $46.66$ $0.00$ Process Lighting $0.00$ $0.00$ $0.00$ $0.00$ TOTALS: $395.21$ $341.53$ $63.70$ $10$ evalues shown hare are based upon the results of an Encry/Pio Compliance energy analysis that uses Tife 24         Average 2pm - 5pm       Standard       Proposed       Margin $6.501$ $11.146$ $200.716$ $73.144$ $900$ $73.144$ $900$ $73.144$ $900$ $73.144$ $900$ $900.601$ $110.425$ $73.244$ $000$ $220.716$ $00$ $000$ $000$ $000$ $000$ $000$ $000$ $000$ $000$ $000$ $000$ $000$ <  |  | <mark>lential</mark> |               |               |                  |                      |                          |      |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $  | Step 1 ANNUAL  | TDV ENERGY U         | JSE (kBtu/sqf | t-yr)         | Step 2           | PERCENT B            | ELOW TITLE 24            |      |
| Space Heating $124.76$ $42.33$ $32.4$<br>Space Cooling $124.76$ $42.33$ $82.43$<br>Heat Rejection $0.00$ $21.13$ $42.13$<br>Heat Rejection $0.00$ $21.13$ $42.03$<br>Domestic Hot Water $27.88$ $27.80$ $0.00$<br>Domestic Hot Water $27.88$ $27.80$ $0.00$<br>Process $46.68$ $46.68$ $0.00$<br>Process $46.68$ $46.68$ $0.00$<br>Process $10.000$ $1.134$ $12.00$<br>Drocess Lighting $0.00$ $0.00$ $0.00$<br>TOTALS: $396.27$ $341.57$ $63.70$<br>Number of the results of an EncryPro Compliance encry analysis that uses Title 24<br>Process $10.668$ $1.134.4$ $1.134.4$ $1.134$<br>Proposed $1.138.4$ $1.134.4$ $1$   | ENERGY COMPONENT   | Standard             | Proposed      | <u>Margin</u> |                  |                      | e                        |      |
| Space Cooling $124.76$ $42.33$ $62.43$<br>indoor Fans $44.69$ $44.67$ $2.203$<br>22.03<br>Pumps $1.36$ $13.44$ $-12.09$<br>Domestic Hot Water $27.88$ $27.88$ $0.00$<br>Dighting $70.47$ $67.19$ $3.221$<br>10.000 $0.00$ $0.00$ $0.00Process 14.57 238.58 = 15.4\%Domestic Hot Water 27.88 27.89 0.000Process 14.57 348.58 = 15.4\%Domestic Hot Water 27.89 27.39 0.000Process 14.57 348.58 = 15.4\%Domestic Hot Water 27.89 17.93 0.000Process Lighting 0.00 0.00 0.00 0.00Process Lighting 1.444 1.1200Process Lighting 1.444 1.1200Process Lighting 1.444 1.1344 200.1The values shown here are based upon the results of an exalt so file 24 profiles as specified in the Alternative Calculation Method manual.Exercise Cooling 1.444.6 1.134.4 200.1Process Lighting 1.444.6 1.134.4 200.1Process Lighting 1.444.6 1.134.4 200.1Process Lighting 1.424.6 1.134.4 200.1Process 1.427.78 0.01.441.40$ $1.134.4$ $0.1134.4$ $0.1134.40$ $0.10$ $0.100$ $1.404.40$ $1.400$ $0.100$ $1.404.40$ $1.400$ $0.1000$ $1.404.40$ $1.400$ $0.1000$ $1.4000$ $1.4000$ $1.40000$ $1.4000000000000000000000000000000000000$  | Space Heating  | 7.04                 | 3.81          | 3.23          | (Excludes Proc   | ess Energy)          |                          |      |
| Indoor Fans<br>Heat Rejection<br>Heat Rejection<br>Domestic Hot Water<br>Liphting<br>Process Lighting<br>TOTALS:<br>366,27<br>1,38<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,2206<br>1,384,341<br>1,344<br>1,2206<br>1,384,341<br>1,344<br>1,2206<br>1,384,341<br>1,344<br>1,2206<br>1,384,341<br>1,344<br>1,2206<br>1,384,342<br>1,344<br>1,2206<br>1,344,341<br>1,2206<br>1,344,341<br>1,2206<br>1,344,341<br>1,2206<br>1,344,341<br>1,2206<br>1,344,341<br>1,2206<br>1,344,3216<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344<br>1,344   | Space Cooling  | 124.76               | 42.33         | 82.43         |                  |                      |                          |      |
| Heat Rejection $0.00$ $21.13$ $21.13$ $21.13$<br>Pumps $1.36$ $1.3.44$ $21.13$ $21.13$<br>Domestic Hot Water $27.88$ $27.88$ $0.00$<br>Lighting $70.47$ $77.19$ $32.87$ $0.00$<br>Process $46.68$ $46.68$ $0.00$<br>Process Lighting $0.00$ $0.00$ $0.00$<br>Process Lighting $0.00$ $0.00$ $0.00$<br>TOTALS: $395.27$ $341.57$ $53.70$ $0.000$<br>Process Lighting $0.000$ $0.00$ $0.00$<br>TOTALS: $395.27$ $341.57$ $53.70$ $0.000$<br>Process Lighting $0.000$ $0.00$ $0.00$<br>Process Lighting $0.000$ $0.000$ $0.000$<br>Process Lighting $0.000$ $0.000$<br>Process Lighting $0.000$ $0.000$ $0.000$<br>Process Lighting $0.0000$ $0.000$<br>Process Lighting $0.0000$ $0.0000$<br>Process Lighting $0.0000$ $0.0000$<br>Process Lighting $0.0000$ $0.00000$<br>Process Lighting $0.00000000000000000000000000000000000$   | 1 0  | 44.69                | 46.72         | -2.03         |                  |                      |                          |      |
| Pumps       1.36       13.44       -12.09       Margin       Standard       % Below         Domestic Hot Water       27.88       0.00       0.00       348.58       =       15.4 %         Receptacle       77.39       70.47       67.19       3.28       0.00 <t< td=""><td></td><td>0.00</td><td>21.13</td><td>-21.13</td><td></td><td></td><td></td></t<>   |  | 0.00                 | 21.13         | -21.13        |                  |                      |                          |      |
| Domestic Het Water<br>Lighting<br>Receptacle<br>Process<br>Lighting<br>TOTALS:<br>395.27]<br>ANNUAL SITE ENERGY USE<br>TOTALS:<br>395.27]<br>ANNUAL SITE ENERGY USE<br>The values shown here are based upon the results of and<br>Energy Pro Complement energy analysis that uses Title 24<br>Peak Demand (kW)<br>1.424.6]<br>Nergy COMPONENT<br>Electricity<br>Natural Gas<br>Electricity<br>Natural Gas<br>Electricity<br>Natural Gas<br>Electricity (kWh)<br>TOTALS:<br>1.390.223<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.0000<br>0.0000<br>0.0000<br>0.0000<br>0.0000<br>0.0000<br>0.0000<br>0.0000<br>0.0000<br>0.0000<br>0.0000<br>0.0000<br>0.0000<br>0.00000<br>0.00000<br>0.00000<br>0.00000<br>0.00000<br>0.00000<br>0.000000<br>0.00000000   | 2  | 1.36                 | 13.44         | -12.09        | Morgin           |                      |                          |      |
| Dominant Number       No         Receptacle       72.39       72.39       72.39       0.00  |  |                      |               |               |                  |                      |                          |      |
| $\begin{array}{c} \label{eq:constraint} \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$  |  |                      |               |               |                  |                      | 10.4 /0                  |      |
| Automatical process $46.68$ $46.68$ $0.00$ $0.00$ Process $0.00$ $341.57$ $53.70$ Conditioned Floor Area = $284.467.01^{\circ}$ sq. ft.Step 3ANNUAL SITE ENERGY USEThe values show here are based upon the results of an manual.Average 2pm - 5pmStandard $1.134.4$ $200.1$ The values show here are based upon the results of an manual.Peak Demand (kW) $1.424.6$ $1.134.4$ $200.1$ The values show here are based upon the results of an manual.ENERGY COMPONENTStandardProposedMarginMarginSpace Heating $6.591$ $11.146$ $200.1$ Natural GasSpace Cooling $1.399.233$ $0$ $443.256$ $0$ Jacor Fans $573.249$ $0$ $266.75$ $0$ Pumps $20.566$ $0$ $173.144$ $0$ $-152.578$ $0$ Domestic Hot Water $348.371$ $0$ $864.772$ $0$ $41.488$ $0$ Ighting $896.260$ $0$ $864.772$ $0$ $41.488$ $0$ Process $606.519$ $0$ $666.519$ $0$ $0$ $260.251$ $0$ $0$ Process Lighting $0$ $260.519$ $0$ $0$ $260.251$ $0$ $0$ $0$ Process Lighting $0$ $0$ $266.71$ $0$ $0$ $0$ $260.251$ $0$ $0$ Process Lighting $0$ $0$ $0$ $0$ $0$ $0$ $0$ $0$ $0$ $0$ $0$ Process Lighting <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>  |  |                      |               |               |                  |                      |                          |      |
| Drocess Lighting       0.00       0.00       0.00       0.00         TOTALS:       395.27       341.57       53.70       Conditioned Floor Area =       284.467.01 <sup>e</sup> sq. ft.         Step 3         ANNUAL SITE ENERCY USE         Average 2pm - 5pm       Standard       Proposed       Margin       The values shown here are based upon the results of an EnergyPro Complexe energy analysis that uses Title 24 manual.         ENERGY COMPONENT       Electricity       Natural Gas       Proposed       Margin       Electricity       Natural Gas         Space Heating       6.697       11.146       Electricity       Natural Gas       Electricity       Natural Gas         Space Heating       6.697       11.146       Electricity       41.027       6.007       4.0.01       5.0.07       6.007       4.0.01       5.0.07       6.007       4.0.01       5.0.07       6.007       4.0.01       5.0.07       6.007       4.0.01       5.0.07       6.007       4.0.01       5.0.07       6.007       4.0.01       5.0.07       6.007       4.0.01       5.0.07       6.007       4.0.01       5.0.07       6.007       4.0.01       5.0.07       6.007       6.007       6.007       6.   | ·  |                      |               |               | Owner Ir         | icentive (>=10%)     |                          |      |
| TOTALS:       395.27       341.57       53.70       Conditioned Floor Area       284.467.0F sq. ft.         Step 3       ANNUAL SITE ENERGY USE       The values shown here are based upon the results of an EnergyPro Compliance energy analysis that uses Title 24 profiles as specified in the Alternative Calculation Method market.         Average 2pm - 5pm       Standard       Proposed       Margin       EnergyPro Compliance energy analysis that uses Title 24 profiles as specified in the Alternative Calculation Method market.         Peak Demand (kW)       Electricity       Natural Gas       Proposed       Margin       Electricity       Natural Gas       Saturat       Natural Gas  |  |                      |               |               |                  |                      |                          |      |
| Step 3       ANNUAL SITE ENERGY USE       The values shown here are based upon the results of an EnergyPro Compliance energy analysis that uses Title 24 profiles as specified in the Alternative Calculation Method manual.         Average 2pm - 5pm       Standard       Proposed       Margin       The values shown here are based upon the results of an EnergyPro Compliance energy analysis that uses Title 24 profiles as specified in the Alternative Calculation Method manual.         ENERGY COMPONENT       Electricity       Natural Gas       Margin       Electricity       Natural Gas       Margin         Space Heating       6.591       11.146       2.551       6.109       4.041       5.037         Ghaor Fans       573.249       0       599.424       0       2.61.75       0         Heat Rejection       0       0       2.62.318       0       2.61.75       0         Domestic Hot Water       348.371       0       854.772       0       0       0         Uighting       896.260       0       854.772       0       0       0       0         Process       0.65.519       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0   | 0 0  |                      |               |               | Conditioned      | <b>Flage Area</b> 2  | 81 167 0 ft2 an <b>t</b> |      |
| The values show here are based upon the results of an<br>EnergyPro Compliance energy analysis that uses Tifle 24<br>profiles as specified in the Alternative Calculation Method<br>manual.Peak Demand (kW)1,424.61,134.4200.1EnergyPro Compliance energy analysis that uses Tifle 24<br>profiles as specified in the Alternative Calculation Method<br>manual.ENERGY COMPONENTStandardProposedMargin<br>(therms)Margin<br>(kWh)Natural Gas<br>(kWh)Electricity<br>(kWh)Natural Gas<br>(kWh)Standard<br>(kWh)Natural Gas<br>(kWh)Standard<br>(kWh)Natural Gas<br>(kWh)Standard<br>(kWh)Natural Gas<br>(kWh)Standard<br>(kWh)Natural Gas<br>(from Step 3)Standard<br>(from Step 3)<   |  |                      |               | 53.70         | Conditioned      | Floor Area = 20      | ο4,407.0 π° sq. π.       |      |
| Notice as provide a specified in the Alternative Calculation Method<br>manual.Peak Demand (kW)1.134.420.1<br>manual.ENERGY COMPONENTStandard<br>ElectricityProposed<br>MarginMargin<br>ElectricityENERGY COMPONENTElectricityNatural Gas<br>(kWh)Natural Gas<br>(kWh)ElectricityNatural Gas<br>(kWh)Standard<br>ProposedProposed<br>MarginMargin<br>ElectricityNatural Gas<br>(kWh)Standard<br>ProposedProposed<br>MarginMargin<br>ElectricityNatural Gas<br>(kWh)Standard<br>ProcessProposed<br>MarginMargin<br>Matural GasStandard<br>ProcessProposed<br>MarginMargin<br>ProcessMargin<br>ProcessStandard<br>ProcessProposed<br>MarginMargin<br>ProcessMargin<br>ProcessProposed<br>MarginMargin<br>ProcessDomestic Hot Water<br>ProcessStandard<br>ProcessProposed<br>ProcessMargin<br>ProcessProposed<br>ProcessMargin<br>ProcessProposed<br>ProcessProposed<br>ProcessMargin<br>ProcessProposed<br>ProcessProposed<br>ProcessProposed<br>P  |  |                      | 002           |               | The values shown | here are based upo   | n the results of an      |      |
| Peak Demand (kW)1.424.61.134.4290.1<br>manual.ENERGY COMPONENTStandardProposedMarginElectricityNatural Gas<br>(kWh)ProposedMarginSpace Heating6.591111.1462.5516.1094.0415.037Space Cooling1.399.3230443.2560956.6670Indoor Fans573.24900262.31802.26.1750Pumps20.5660173.14402.46.31002.62.3180Domestic Hot Water348.3710348.3710441.48800Lighting896.2600854.47200000Process90.651906.06.51900000Process Lighting01.1.464.235.7866.103560.5255.037Step 4POTENTIAL OWNER INCENTIVE CALCULATION% Below Tile-24*Incentive Savings<br>(trom step 2)SubtolMatural Gas1.5.4 %% Bolow Tile-24*Natural Gas2.90.10Correl Incentive% Below Tile-24*Incentive Savings<br>(trom step 2)SubtolDescription00000Process00000Process00000Correl Incentive% Below Tile-24*Incentive Savings<br>(trom step 2)SubtolStep 4Out and an anotacid with a saving and anotacid with a savin   | Average 2pm - 5pm  | Standard             | Proposed      |               |                  |                      |                          |      |
| ENERGY COMPONENT<br>ElectricityElectricityNatural Gas<br>(therms)ElectricityNatural Gas<br>(therms)ElectricityNatural Gas<br>(therms)Space Heating $6.591$ $11,146$ $2.551$ $6.109$ $4.041$ $5.037$ Space Cooling $1.399,323$ $0$ $443,256$ $0$ $956,067$ $0$ Indoor Fans $573,249$ $0$ $262,318$ $0$ $2-26,775$ $0$ Heat Rejection $0$ $0$ $222,318$ $0$ $2-26,775$ $0$ Domestic Hot Water $348,371$ $0$ $348,371$ $0$ $0$ $0$ Lighting $896,260$ $0$ $854,772$ $0$ $41,488$ $0$ Process $606,519$ $0$ $0$ $0$ $0$ $0$ $0$ Process $606,519$ $0$ $0$ $0$ $0$ $0$ $0$ Process Lighting $0$ $0$ $0$ $0$ $0$ $0$ $0$ Notacts: $4.796,311$ $11,146$ $4.235,786$ $6,109$ $560,525$ $5.037$ Step 4POTENTIAL OWNER INCENTIVE CALCULATIONSelow Title-24IncentiveSavingsSempra Energy utility"Natural Gas $=$ $100.00$ $20.01$ $=$ $50,037$ Electricity (kWh) $15.4\%$ $5.037$ $=$ $50,037$ Electricity (kWh) $15.4\%$ $5.037$ $=$ $50,037$ Electricity (kWh) $5.037$ $=$ $5.037$ $50,037$ Electricity (kWh) $15.4\%$ $5.037$ $=$ <  | Peak Demand (kW)   | 1,424.6              | 1,134.4       | 200.1         | , ,              | a in the Alternative | Calculation Method       |      |
| Space Heating $6,591$ 11,146 2,551 $6,109$ 4,041 $5,037$<br>Space Cooling $1,399,323$ $0$ $433,256$ $0$ $260,715$ $0$<br>Indoor Fans $573,249$ $0$ $262,318$ $0$ $2-26,175$ $0$<br>Heat Rejection $0$ $0$ $262,318$ $0$ $2-26,2378$ $0$ $0$<br>Pumps $20,566$ $0$ $173,144$ $0$ $-152,578$ $0$ $0$<br>Domestic Hot Water $348,371$ $0$ $348,371$ $0$ $0$ $0$ $0$ $0$ $0$ $0$ $0$ $0$ $0$   |  |                      |               |               |                  |                      |                          |      |
| Space Heating $\begin{bmatrix} 6.691 \\ 1.399,323 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $  | ENERGY COMPONENT   |                      |               |               |                  |                      |                          |      |
| Indoor Fans<br>Indoor Fans<br>Heat Rejection<br>Pumps<br>20,566<br>Domestic Hot Water<br>1348,371<br>10<br>1348,371<br>10<br>1348,371<br>10<br>1348,371<br>10<br>1348,371<br>10<br>1348,371<br>10<br>173,144<br>10<br>173,144<br>10<br>173,144<br>10<br>152,578<br>10<br>152,578<br>10<br>152,578<br>10<br>152,578<br>10<br>152,578<br>10<br>152,578<br>10<br>152,578<br>10<br>152,578<br>10<br>152,578<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10  | Space Heating  |                      | 11,146        |               | 6,109            |                      |                          |      |
| Heat Rejection<br>Pumps<br>Domestic Hot Water<br>Lighting<br>Receptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Process<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Process<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Process<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Beceptacle<br>Bec  | Space Cooling  | 1,399,323            | 0             | 443,256       | 0                | 956,067              | 0                        |      |
| Pumps 20,566 0 173,144 0 -152,578 0 0<br>Domestic Hot Water 348,371 0 0 41,488 0 0<br>Lighting 896,260 0 945,432 0 0 41,488 0 0<br>Process 606,519 0 0 0 0 0 0 0 0 0 0 0 0 0<br>Process Lighting 4,796,311 11,146 4,235,786 6,109 560,525 5,037<br>Step 4 POTENTIAL OWNER INCENTIVE CALCULATION<br>Step 4 Step 4 St  | Indoor Fans  | 573,249              | 0             | 599,424       | 0                | -26,175              | 0                        |      |
| Number348,3710348,37100Lighting896,2600854,772041,4880Receptacle945,4320945,432000Process606,5190606,519000Process Lighting000000TOTALS:4,796,31111,1464,235,7866,109560,5255,037Step 4POTENTIAL OWNER INCENTIVE CALCULATION% Below Title-24*<br>(from step 2)Incentive<br>(from step 2)Savings<br>(from Step 3)Subtotal<br>\$86,321The<br>Gas<br>CompanyElectricity (kWh)15.4 %15.4 ×560,525\$86,321<br>\$86,321Image: Sempra Energy utility"Natural Gas=100.00×290.1\$29,010Stavings By Design Program for new construction and are NOT GUARANTEED.Projects MUST receive prior, written<br>approval from The Utility during conceptual or early design development and must meet all other program requirements<br>to qualify. Potential incentives are subject to program limitations based upon the increnental cost of the measures.<br>"% Below in this equation is limitations based upon the increnent all other program requirements<br>to gaudion this equation is limitations based upon the increnent all other program requirements<br>to gaudion this equation is limitations based upon the increnent all other program requirements<br>to gaudion this equation is limitations based upon the increnent all other program requirements<br>to gaudion this equation is limitations based upon the increnent all other program requirements<br>to down this equation is limitations  | Heat Rejection   | 0                    | 0             | 262,318       | 0                | -262,318             | 0                        |      |
| Lighting $\frac{96,260}{945,432}$ $\frac{9}{945,432}$ $\frac{0}{945,432}$ $\frac{1}{15,4}$ $\frac{1}{5,60,525}$ $\frac{1}{5,037}$ $\frac{1}{560,525}$ $\frac{1}{5,037}$ $\frac{1}{560,525}$ $\frac{1}{5,037}$ $\frac{1}{560,525}$ $\frac{1}{50,037}$ $\frac{1}{560,525}$ $\frac{1}{50,037}$ $\frac{1}{560,525}$ $\frac{1}{50,037}$ $\frac{1}{50,000}$ $\frac{1}{82,9,010}$ $\frac{1}{5,4}$ $\frac{1}{50,000}$ $\frac{1}{8,100}$ $\frac{1}$ | Pumps  | 20,566               | 0             | 173,144       | 0                | -152,578             | 0                        |      |
| Receptacle<br>Receptacle<br>Process<br>Brocess Lighting<br>TOTALS: 4,796,311<br>TOTALS: 4,796,311   | Domestic Hot Water   | 348,371              |               | 348,371       |                  |                      | 0                        |      |
| Process Lighting<br>Process Lighting<br>TOTALS: 4,796,311 11,146 4,235,786 6,109 560,525 5,037<br>Step 4 POTENTIAL OWNER INCENTIVE CALCULATION<br>% Below Title-24*<br>(from step 2)<br>The case company Electricity (kWh) 15.4 % 560,525 \$   | Lighting   | 896,260              |               | 854,772       |                  | 41,488               | 0                        |      |
| Process Lighting $0$ $0$ $0$ $0$ $0$ $0$ $0$ $0$ $0$ $0$   | •  |                      |               |               |                  |                      |                          |      |
| TOTALS: 4,796,31111,1464,235,7866,109560,5255,037Step 4POTENTIAL OWNER INCENTIVE CALCULATION% Below Title-24*Incentive<br>RateSavings<br>(from Step 3)Subtotal<br>\$\$86,321The<br>Gas<br>CompanyElectricity (kWh)15.4 %SolutionSempra Energy utility"Natural Gas $100.00$ \$ $$290.1$ \$ $$5,037$ Owner Incentive $$100.00$ \$ $$290.1$ \$ $$29,010$ \$ $$$/kW$ kWKWkWkWCompanyElectricity (kW) $=$ $$29,010$ \$ $$$/kW$ kWKW $$290.1$ \$ $$29,010$ \$ $$$/kW$ kWSempra Energy utility"Natural Gas $$100.00$ \$ $$290.1$ \$ $$29,010$ \$ $$$/kW$ kWMatural Gas $$290.1$ \$ $$5,037$ Owner Incentive(\$100.00\$ $$$$$29,010$$$$$$$$$Owner Incentive($$100.00$$$$   |  |                      |               |               |                  |                      |                          |      |
| Step 4POTENTIAL OWNER INCENTIVE CALCULATION% Below Title-24*IncentiveSavings(from step 2)15.4 $x$ $560,525$ $$86,321$ The<br>GasElectricity (kWh) $15.4\%$ $15.4\%$ $x$ $290.1$ $$29,010$ $\&$ Sempra Energy utility"Electricity (kW) $=$ $100.00$ $x$ $290.1$ $$29,010$ $\&$ Sempra Energy utility"Natural Gas $=$ $100.0$ $x$ $5,037$ $$5,037$ Potential incentives indicated on this report are available only through the Whole Building Approach Element of the<br>Savings By Design Program for new construction and are NOT GUARANTEED. Projects MUST receive prior, written<br>approval from The Utility during conceptual or early design development and must meet all other program requirements<br>to qualify. Potential incentives are subject to program limitations based upon the incremental cost of the measures.<br>"% Below in this equation is limited to 30"   |  |                      |               | -             |                  |                      | -                        |      |
| % Below Title-24*<br>(from step 2)Incentive<br>RateSavings<br>(from Step 3)Electricity (kWh) $15.4\%$ $15.4\%$ $560,525$ $$86,321$ $kWh$ $15.4\%$ $16.4\%$ $$290.1$ $$29,010$ $kWh$ $$100.00$ $$290.1$ $$29,010$ $$29,010$ $$20,010$ $$/kW$ $$100.00$ $$290.1$ $$29,010$ $$20,010$ $$/kW$ $$100.00$ $$290.1$ $$29,010$ $$20,010$ $$/kW$ $$100.00$ $$100.00$ $$290.1$ $$29,010$ $$20,010$ $$100.00$ $$100.00$ $$200.1$ $$20,010$ $$200.1$ $$200.10$ $$100.00$ $$100.00$ $$100.00$ $$200.1$ $$200.10$ $$100.00$ $$100.00$ $$100.00$ $$200.1$ $$100.00$ $$100.00$ $$100.00$ $$100.00$ $$200.1$ $$100.00$ $$100.00$ $$100.00$ $$100.00$ $$200.1$ $$100.00$ $$100.00$ $$100.00$ $$100.00$ $$200.1$ $$100.00$ $$100.00$ $$100.00$ $$100.00$ $$200.1$ $$100.00$ $$100.00$ $$100.00$ $$100.00$ $$200.10$ $$100.00$ $$100.00$ $$100.00$ $$100.00$ $$200.10$ $$100.00$ $$100.00$ $$100.00$ $$100.00$ $$200.10$ $$100.00$ $$100.00$ $$100.00$ $$100.00$ $$200.10$ $$100.00$ $$100.00$ $$100.00$ $$100.00$ $$200.10$ $$100.00$ $$100.00$ $$100.00$ $$100.00$ $$200.10$ $$100.00$ $$100.00$ <   |  | , ,                  | ,             | , ,           | 6,109            | 560,525              | 5,037                    |      |
| (from step 2)Rate(from Step 3)SubtotalImage: Line colspan="2">Image: Line colspan="2" (from Step 3)Image: Line   | Step 4 POTENTI   |                      |               |               | Incentiv         | ve Savinos           | 3                        |      |
| The<br>Gas<br>CompanyElectricity (kW) $kWh$ $kWh$ $\swarrow$ Electricity (kW) $=$ $100.00$ $\times$ $290.1$ $=$ $$29,010$ $\checkmark$ Sempra Energy utility"Natural Gas $=$ $100.0$ $\times$ $5,037$ $=$ $$5,037$ Owner IncentiveOwner Incentive(\$150,000 max) = $$120,368$ Potential incentives indicated on this report are available only through the Whole Building Approach Element of the<br>Savings By Design Program for new construction and are NOT GUARANTEED. Projects MUST receive prior, written<br>approval from The Utility during conceptual or early design development and must meet all other program requirements<br>to qualify. Potential incentives are subject to program limitations based upon the incremental cost of the measures.<br>"% Below in this equation is limited to 30"  |  |                      | (fro          | om step 2)    | Rate             | (from Step           | o 3) Subtotal            |      |
| Gas<br>CompanyElectricity (kW)= $100.00$ × $290.1$ = $$29,010$ Sempra Energy utility"Natural Gas= $100.00$ × $5,037$ = $$5,037$ Owner Incentive(\$150,000 max) = $$120,368$ Potential incentives indicated on this report are available only through the Whole Building Approach Element of the<br>Savings By Design Program for new construction and are NOT GUARANTEED. Projects MUST receive prior, written<br>approval from The Utility during conceptual or early design development and must meet all other program requirements<br>to qualify. Potential incentives are subject to program limitations based upon the incremental cost of the measures.<br>"% Below in this equation is limited to 30"  |  | Electricity (kWh)    | )             | 15.4 %        |                  |                      | 525 = \$86,321           |      |
| Sempra Energy utility" Natural Gas $=$ 100.0 × 5,037 $=$ \$5,037 therm $($150,000 \text{ max}) =$ $$120,368$<br>Potential incentives indicated on this report are available only through the Whole Building Approach Element of the Savings By Design Program for new construction and are NOT GUARANTEED. Projects MUST receive prior, written approval from The Utility during conceptual or early design development and must meet all other program requirements to qualify. Potential incentives are subject to program limitations based upon the incremental cost of the measures.  | Gas  | Electricity (kW)     |               |               |                  | _                    | 90.1 = \$29,010          |      |
| Owner Incentive (\$150,000 max) = \$120,368<br>Potential incentives indicated on this report are available only through the Whole Building Approach Element of the<br>Savings By Design Program for new construction and are NOT GUARANTEED. Projects MUST receive prior, written<br>approval from The Utility during conceptual or early design development and must meet all other program requirements<br>to qualify. Potential incentives are subject to program limitations based upon the incremental cost of the measures.<br>"% Below in this equation is limited to 30"   | A Sempra Energy utility <sup>®</sup> Natural Gas = 100.0 × 5,037 = \$5,037   |                      |               |               |                  |                      |                          |      |
| Potential incentives indicated on this report are available only through the Whole Building Approach Element of the Savings By Design Program for new construction and are NOT GUARANTEED. Projects MUST receive prior, written approval from The Utility during conceptual or early design development and must meet all other program requirements to qualify. Potential incentives are subject to program limitations based upon the incremental cost of the measures.  |  | Owner                | Incentive     | <b></b>       | ψπισπ            | •                    | () = \$120.368           |      |
| *% Below in this equation is limited to 30   | Potential incentives indicated on this report are available only through the Whole Building Approach Element of the Savings By Design Program for new construction and are NOT GUARANTEED. Projects MUST receive prior, written approval from The Utility during conceptual or early design development and must meet all other program requirements |                      |               |               |                  |                      |                          |      |
|  | *% Below in this equation is limited to 30%.   |                      |               |               |                  |                      |                          |      |

**Residential Areas** (See common residential corridors on following page)

|  |                  |               |                  | VE WORKSHEET UTIL-   |  |
|--|------------------|---------------|------------------|--|--|
| Project Name   | 5                |               |                  | Date   |  |
| MGA Campus - Residentia  |                  |               |                  | 4/9/2014   |  |
| Step 1 ANNUAL T  | DV ENERGY        | USE (kBtu/sqf | t-yr)            | Step 2 PERCENT BELOW TITLE 24  |  |
| ENERGY COMPONENT   | <u>Standard</u>  | Proposed      | <u>Margin</u>    | Adjusted TDV Energy Use<br>(Excludes Process Energy)   |  |
| Space Heating  | 0.02             | 0.19          | -0.18            |  |  |
| Space Cooling  | 54.40            | 29.66         | 24.74            | Standard Proposed<br>Design Design Margin  |  |
| Indoor Fans  | 10.53            | 6.71          | 3.82             | 155.15 - 127.03 <b>=</b> 28.12   |  |
| Heat Rejection   | 0.00             | 0.00          | 0.00             |  |  |
| Pumps  | 2.90             | 3.18          | -0.28            | Standard         % Below           Margin         Design         Title 24*   |  |
| Domestic Hot Water   | 20.12            | 20.11         | 0.01             | 28.12 / 155.15 <b>=</b> 18.1 %   |  |
| Lighting   | 33.59            | 33.59         | 0.00             | Incentive Eligibility Yes No   |  |
| Receptacle   | 33.59            | 33.59         | 0.00             | Owner Incentive (>=10%)  |  |
| Process  | 0.00             | 0.00          | 0.00             |  |  |
| Process Lighting   | 0.00             | 0.00          | 0.00             |  |  |
| TOTALS:  | 155.15           | 127.03        | 28.12            | Conditioned Floor Area = 696,006.5 ft <sup>2</sup> sq. ft.   |  |
| Step 3 ANNUAL S  | ITE ENERGY       | USE           |                  |  |  |
| Average 2pm - 5pm  | Standard         | Proposed      |                  | The values shown here are based upon the results of an<br>EnergyPro Compliance energy analysis that uses Title 24  |  |
| Peak Demand (kW)   | 1.034.1          | 729.3         | 204.0            | profiles as specified in the Alternative Calculation Method  |  |
|  | Stand            | lard          |                  | manual.<br>posed Margin  |  |
| ENERGY COMPONENT   | Electricity      | Natural Gas   | Electricity      | Natural Gas Electricity Natural Gas  |  |
| Crease Liesting  | (kWh)            | (therms)      | (kWh)<br>6.829   | (therms) (kWh) (therms)  |  |
| Space Heating<br>Space Cooling   | 569<br>1,552,789 | 0             | 6,829<br>816,811 | 0 -6,260 0 0 735,977 0   |  |
| Indoor Fans  | 314,735          | 0             | 192,462          | 0 122,272 0  |  |
| Heat Rejection   | 0                | 0             | 0                |  |  |
| Pumps  | 92,487           | 0             | 104,657          | 0 -12,169 0  |  |
| Domestic Hot Water   | 0                | 85,597        | 0                | 85,544 0 53  |  |
| Lighting   | 1,143,190        | 0             | 1,143,190        | 0 0 0  |  |
| Receptacle   | 1,143,190        | 0             | 1,143,190        | 0 0 0  |  |
| Process  | 0                | 0             | 0                | 0 0 0  |  |
| Process Lighting   | 0                | 0             | 0                | 0 0 0  |  |
| TOTALS:  | 4,246,959        | 85,597        | 3,407,139        | 85,544 839,820 53  |  |
| Step 4 POTENTIA  | L OWNER INC      |               | CULATION         | Incentive Savings  |  |
| The<br>Gas   | lectricity (kWh  | (fro          | 18.1 %           | $\begin{array}{c} \textbf{Rate} \\ \hline 18.1 \\ \text{$\xi/kWh} \end{array} \times \begin{array}{c} (from \text{ Step 3}) \\ 839,820 \\ kWh \end{array} = \begin{array}{c} \text{Subtotal} \\ \$152,007 \\ \$Wh \end{array}$ |  |
| CompanyElectricity (kW)= $100.00$ × $304.9$ =\$ $30,490$ A Sempra Energy utility"Natural Gas= $100.0$ × $53$ =\$ $53$  |                  |               |                  |  |  |
| ¢/therm therm (\$150,000 max) = \$150,000  |                  |               |                  |  |  |
| Potential incentives indicated on this report are available only through the Whole Building Approach Element of the<br>Savings By Design Program for new construction and are NOT GUARANTEED. Projects MUST receive prior, written<br>approval from The Utility during conceptual or early design development and must meet all other program requirements<br>to qualify. Potential incentives are subject to program limitations based upon the incremental cost of the measures.<br><i>EnergyPro 5.1.9.2 by EnergySoft</i> User Number: 4921 A <b>RunCode: 2014-04-09T14:49:48</b> ID: Page 1 of 1 |                  |               |                  |  |  |

Unconditioned common corridors for residential

#### BAU Summary

|           | Area Estimate<br>(sf) | Lighting<br>watts/sf | Hours/yr | kWh/yr  |
|-----------|-----------------------|----------------------|----------|---------|
| Corridors | 190,000               | 0.6                  | 8,760    | 998,640 |

## Proposed Summary

|           | Area Estimate<br>(sf) | Lighting<br>watts/sf | Hours/yr  | kWh/yr  |
|-----------|-----------------------|----------------------|-----------|---------|
| Corridors | 190,000               | 0.6                  | 6,570 (*) | 748,980 |

(\*) Occupancy sensors required in 2013 code. 25% savings in Corridors from 2013-2014 Statewide Customized Procedures Manual for Business - Section 2, Estimating Energy Savings

## Site Energy Use

#### BAU Summary

|                 | Area Estimate<br>(sf) | Lighting<br>watts/sf | Hours/yr | kWh/yr    |
|-----------------|-----------------------|----------------------|----------|-----------|
| Covered Parking | 588,995               | 0.3                  | 8,760    | 1,547,879 |
| Exposed Parking | 7,837                 | 0.092                | 4,380    | 3,158     |
| Total           |                       |                      |          | 1,551,037 |

#### Proposed Summary

|                 | Area Estimate<br>(sf) | Lighting<br>watts/sf | Hours/yr  | kWh/yr  |
|-----------------|-----------------------|----------------------|-----------|---------|
| Covered Parking | 588,995               | 0.2                  | 7,446 (*) | 877,131 |
| Exposed Parking | 7,837                 | 0.090                | 4,380     | 3,089   |
| Total           |                       |                      |           | 880,221 |

(\*) Occupancy sensors required in 2013 code. 15% savings in Corridors from 2013-2014 Statewide Customized Procedures Manual for Business - Section 2, Estimating Energy Savings