SYSKA HENNESSY GROUP

Oceanside Pavilion

Oceanside, California

Climate Action Plan Conformance Report

EIR Amendment 08/28/2019

PREPARED FOR:

Zephyr/Gensler

BY:

Syska Hennessy Group, Inc.

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INTRODUCTION

The city of Oceanside has adopted a Climate Action Plan to address energy consumption, burning of fossil fuels, deforestation, solid waste decomposition and water reduction usage reduction strategies in order to meet the 2030 and 2050 environmental mandates. In 2015 the Obama Administration enacted the Clean Power Plan (CPP) which requires states to meet specific standards for the reduction of carbon dioxide emissions. In addition, State legislation enacted by Governor Arnold Schwarzenegger (and furthered by Governor Brown) has established 2020 and 2030 statewide emission reduction targets and has mandated that electric utilities achieve a 33% minimum renewable power portfolio by 2020 and 50% by 2030.

Project Background

The proposed project area is approximately 950,000 square feet and consists primarily of retail and hotel amenities as well as a 300-key hotel located in the City of Oceanside. The project was started in 2008 will now be submitted as an Addendum to the 2008 Environmental Impact Report. In early 2019, City of Oceanside approved an amendment to implement a Climate Action Plan (CAP) to meet the state emission reduction target mandates. The Oceanside CAP program investigated measures that would reduce carbon emissions in the most economical and efficient manner. The measures that had the most value is now being implemented. The climate action plan's measures vary in their requirements from Photovoltaic installation to Urban Forestry tree planning program. This report outlines the project requirements, path to conformance and additional energy efficient measures.

CLIMATE ACTION PLAN REQUIREMENTS

The city of Oceanside has taken greenhouse emissions inventories from the year 2013. The baseline level of CO2 emissions per capita is 5.8 MT CO2. The target levels per capita is 4.4 MT CO2 by 2030. Furthermore, the city of Oceanside has adopted aggressive reduction goals per capita. The reduction goals for 2040 is to reduce emission levels to 3 MT CO2 by 2040 and down to 2 MT CO2 by 2050. The target levels set by Oceanside near term are more aggressive than the state per capita targets requiring more immediate action at the project level. There are no minimum greenhouse emission reduction targets at the building level. Instead, the Oceanside CAP has mandated measures at the project level to attain CO2 reduction targets.

The following measures are required to conform with the city of Oceanside's Climate Action Plan:

E2 – SOLAR PHOTOVOLTAIC PROMOTION PROGRAM

The city of Oceanside's goal for the year 2030 is to generate 75% of local energy from renewable source. In order to achieve that, the CAP requires that all new development that include 50 or more off-street parking spaces to offset a minimum of 50% of the forecasted energy demand.

The estimate electrical load for the site is 10,000 Kw. The breakdown of electrical demand can be found under the Table 7. Table 1 summarizes the total electrical load and the required renewable energy offset requirement.

To comply with the climate action plan, the project is required to generate a minimum of 5,000 kilowatts through photovoltaic panels or other renewable sources.

Power Demand (Electricity)	Power Required (Kw)
Buildings	3,060
Pool Heating	1,900
Wave Pool	5,040

Total Electricity Demand	10,000
Required PV Offset	5,000

Table 1

W3 – LOCAL WATER SUPPLY DEVELOPMENT

Water system's consume energy for the extraction, conveyance, treatment and distribution to end uses. California imports water over a long distance requiring extremely high energy use. Wastewater is typically treated and the released into the environment. With additional treatment, wastewater may be recycled and reused. Reducing the amount of water required to be imported. Oceanside is a member of the North San Diego County Water Reuse Coalition, which seeks to convert facilities to recycled water services, increase the storage capacity and interconnect recycled water facilities. The city of Oceanside seeks to replace potable water uses with recycled water components wherever appropriate and distribute recycled water to meet recycled water demands.

- To comply with the intent of climate action plan, the project is required to provide a connection for recycled water integration with city's recycled water network. The CAP does not specify a minimum pipe size for reclaimed water.

TL1 – SMART GROWTH POLICIES

The city of Oceanside seeks to design communities that better integrate to encourage alternate modes of transportation and reduce the vehicle trip lengths.

- To comply with this measure, all projects that are sited outside a Smart Growth Opportunity Area are assumed to develop uses that would be consistent with land use designation and all projects sited inside an SGOA are assumed to develop uses that consistent with character of the SGOA type.

TL2 – EXPANDED ELECTRICAL VEHICLE CHARGING INFRASTRUCTURE

Zero emission vehicles do not produce any greenhouse emissions. The climate action plan requires that all new development provide prewire for at least 6% of the available parking spaces and provide a charging station for at least half of the prewired spaces.

- To comply with the climate action plan measure, the project is required to provide prewired to allow for future level 2 PEV charging system installations. 3% of the prewired spaces are required to have charging station installed with the project and the other 3% are only to be pre-wired.

TL3 – PREFERENTIAL PARKING SPACES FOR ZERO EMISSIONS VEHICLES

To encourage the use of zero emission vehicles, this CAP measure requires that projects incorporate 12% designated parking for clean vehicles.

- To comply with the climate action plan, 12% of the parking spaces are required to be preferential parking spaces for clean air vehicles.

TL5 – TRANSPORTATION DEMAN MANAGEMENT PLANS

Transportation Demand Management (TDM) refers to programs that help in reducing peak traffic hour congestion by encouraging the use of alternate transportation.

- To comply with the climate action plan, a TDM strategy shall be implemented for any project that generates more than 100 vehicle trips per day.

AF1 – URBAN FORESTY PROGRAM

Trees sequester carbon while helping cool the local environment by providing local shade and reducing surface temperatures. Oceanside's Urban Forestry Program requires that new development incorporate shade trees.

- To comply with the climate action plan, the project is required to plant 200 additional trees per year.

ENERGY USAGE AND CARBON EMISSIONS

Building Energy Usage

An energy model of the site was constructed to estimate the required peak electrical and natural gas demand and to compare different mechanical systems. The system that produced the least amount of carbon emissions was selected as the system of choice for the project. The energy model's assumptions were based on the 2019 Title 24 Energy Code performance requirements. The target energy usage intensity (EUI) targets were aligned to match the current Energy Star Building Benchmark portfolio. Table 2 shows the target EUI for similar building types. The buildings with the highest energy usage intensity will be the food and beverage and market building types, however the overall square footage for these buildings is relatively small compared to the overall building square footage.

BUILDING ENERGY USAGE INTENSITY			
Building Type	**Square Footage**	**Baseline EUI**	**Target EUI**
Retail RT1 (Fitness)	35,000	60	48
Retail RT2	9,000	55	42
Retail RT3	9,000	55	42
Retail RT4	13,500	160	130
Retail RT5 (Office)	8,000	53	42
Retail RT6	6,000	55	42
Retail RT7	6,000	55	42
Retail RT8 (Office)	23,500	53	42
Hotel RH1	197,500	65	52
Hotel RH2 (Casitas)	8,500	55	40
Hotel RH3 (Villas)	35,000	55	40
Hotel RH3 (Villa Clubhouse)	750	55	44
Wellness RA1	14,000	52	42
Conference RA2	28,500	60	48
Cabana Clubhouse RA3	750	54	43
F&B / Surf Check in RA4	10,000	160	128
Aussie Surf Club RA5	3,000	56	45
Fieldhouse RA6	2,000	56	45

Table 2

The energy model output report can be found on page 7. The energy model report highlights the building estimated energy usage and carbon emissions using a VRF system, gas cooking, electrical refrigeration and solar panel energy displacement as well as the estimated energy cost. The cost is assumed under a standard Kwh rate and does not include operating the wave pool or outdoor pool heating.

Wave Pool Energy Usage

in addition to the buildings, Oceanside Pavilion will also have a wave pools capable of producing up to 6 ½ foot waves. Power consumption data is provided in table 3 for various configurations and operations. The wave pool will utilize 24 caissons in the design and will require 5,040 kilowatts of installed power. The estimated peak power consumption is 4,032 kwh at max frequency for 24 caissons. The wave pool is not intended to run continuous but will instead run at intermittent intervals.

# OF CAISSONS	12		16		20		24	
DESIRED WAVE HEIGHT	2.00 m	6.6 ft	2.00 m	6.6 ft	2.00 m	6.6 ft	2.00 m	6.6 ft
POWER & ENERGY	Low	High	Low	High	Low	High	Low	High
INSTALLED POWER	2,340 kW	2,520 kW	3,120 kW	3,360 kW	3,900 kW	4,200 kW	4,680 kW	5,040 kW
AVG ENERGY CONSUMPTION @ 15s (max frequency)	1,872 kWh	2,016 kWh	2,496 kWh	2,688 kWh	3,120 kWh	3,360 kWh	3,744 kWh	4,032 kWh
AVG ENERGY CONSUMPTION @ 30s	936 kWh	1,008 kWh	1,248 kWh	1,344 kWh	1,560 kWh	1,680 kWh	1,872 kWh	2,016 kWh

Table 3

Table 4 shows the estimated energy usage associated with the wave pool for various operating times. Due to the unknown actual hours of operation, a range is given to show the lower and upper limits of the estimated energy usage for operating the wave pool under 10 hours a day, 365 days a year scenario. If the assumption is that the wave pool operates for 50 minutes on and 10 minutes off, then in the 10-hour day, the total hours used would be approximated 8.3 hours of operating usage.

Wave Pool Energy Usage			
Operating Time (Hrs.)	Energy Consumption (kWh)	Operating Days	Kwh/Year
2	4,032	365	2,943,360
4	4,032	365	5,886,720
6	4,032	365	8,830,080
8	4,032	365	11,773,440
10	4,032	365	14,716,800

Table 4

Energy Model Output Report

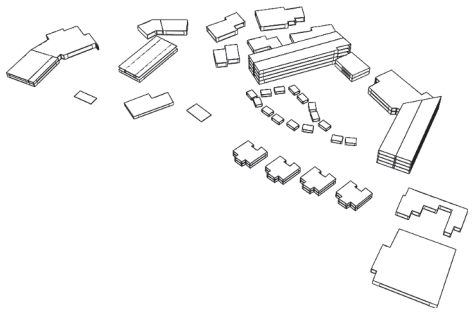
Project:	OSide Pavilion
Address:	
Climate File:	CZ08RV2.epw
Simulation:	20190826 EIR Addendum.aps

Design Team:	Syska Hennessy
Energy Analyst:	EOrtiz
Owner:	Zephyr
Conditioned Area (ft²):	410000

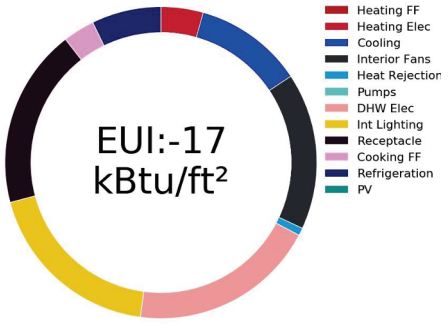
Annual Energy Consumption (kBtu/ft²/year) & CO2 KgCO2/ft²/yr

Energy End Use	Site Energy	Source Energy	CO2 Emissions
Heating Fossil Fuel	0.0	0.0	0.0
Heating Electricity	2.8	8.7	0.4
Space Cooling	7.2	22.5	1.1
Fans Interior	10.4	32.9	1.6
Heat Rejection	0.5	1.5	0.1
Pumps	0.0	0.0	0.0
DHW Fossil Fuel	0.0	0.0	0.0
DHW Electricity	12.4	39.0	1.9
Interior Lighting	12.0	37.7	1.8
Exterior Lighting	0.0	0.0	0.0
Receptacle	11.9	37.6	1.8
Data Center	0.0	0.0	0.0
Cooking Fossil Fuel	2.1	2.3	0.1
Cooking Electricity	0.0	0.0	0.0
Elevators & Escalators	0.0	0.0	0.0
Refrigeration	4.6	14.5	0.7
Process	0.0	0.0	0.0
TOTAL (ex renewables)	**63**	**196**	**9**

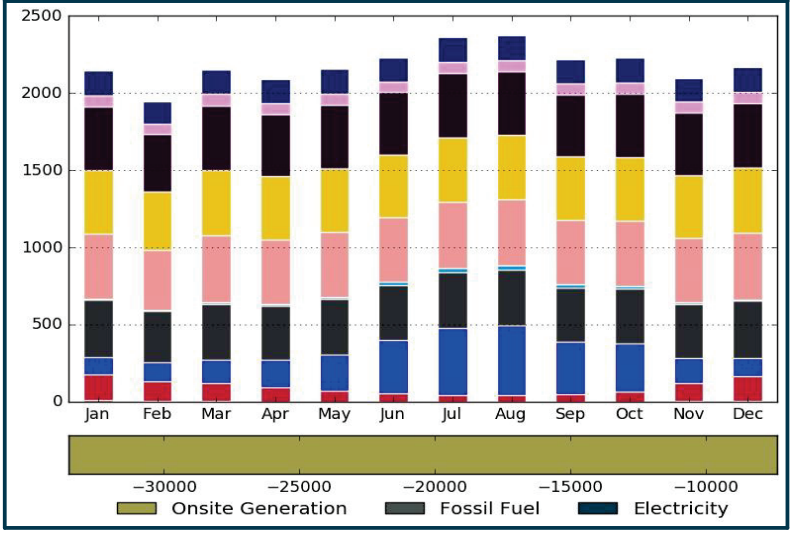
Project Viewer - 3D Model



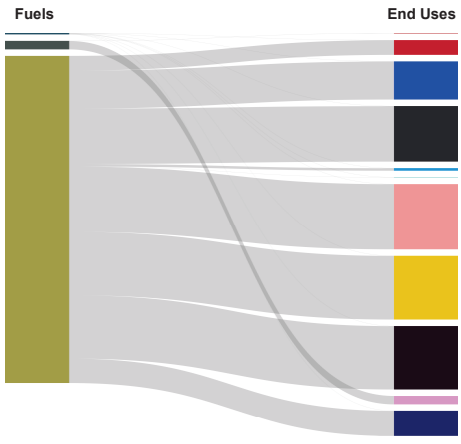
Site Energy Use Intensity



Site Energy Dashboard (MBtu)



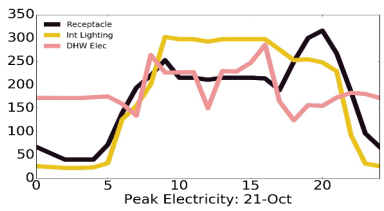
Site Energy Flows – Sankey Diagram

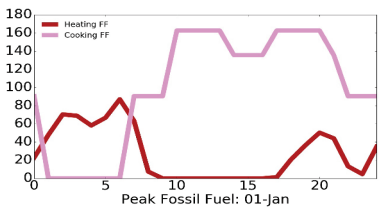


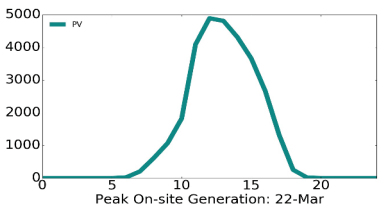
Annual Fuel Costs and Peak Demands

Fuels	Cost ($)	Peak Day	Peak Time	Peak Demand
Electricity	1,342,905.00	21-Oct	14:00	1,727.4 kW
Fossil Fuel	8,452.00	01-Jan	20:00	212.9 kBtu/h
Total	1,351,357.00	21-Oct	14:00	

Peak Energy Sources for Electricity (kW), Fossil Fuel (kBtu/h) and Onsite Power Generation (kW): Top 3 Contributors







Pool Heating Energy Usage

Oceanside Pavilion will have 3 pools that will be heated. The area and heating demand for the pools can be found in table 5. The surface area of the lazy river pool, Lap Pool and Climbing wall pool are 16,300 sf, 3,750 sf and 10,000 sf respectively. For the purpose of sizing the equipment, it is assumed that the pools will have a heating setpoint of 78 degrees. On average for every 1 degree that pool heating setpoints are raised results an increase of 7% yearly energy consumption.

Incentives to offset pool heating costs are available through the California Solar Initiative Thermal Program. The incentive per annual therm displaced is $6.00 with a maximum rebate of $500,000 and not to exceed 50% of the solar thermal system installation cost. The project will only qualify for the incentive if natural gas is not the fuel source of choice for heating pools. Commercial pools do not qualify for federal tax incentives.

To reduce the amount of energy consumption the following implementations are recommended:

1. High COP (Coefficient of Performance) Heat Pump
2. Provide an opaque thermal pool cover when the pool is not in use.
3. Integrate a solar thermal system for pool heating.
4. Recover heat rejection from Casitas HVAC systems for lazy river.

Pool Heating				
	Surface Area	**Set Point**	**Heating Requirement (MBH)**	**Heating Requirement (Kw)**
Lazy River	16,300	78	3,912	1,147
Lap Pool	3,750	78	900	264
Climbing Wall Pool	10,000	78	2,400	704

Table 5

MEP

Mechanical

The Oceanside Pavilion project requires a system that is low maintenance, flexible and one that follows Oceanside's Climate Action Plan. Oceanside's Climate Action Plan encourages the use of fuel from renewable sources and discourages the use of combustible energy sources. As such, natural gas consumption is limited to the food and beverage buildings, fitness center and overhead gas fired heaters.

Space cooling and heating will be provided through air source Variable Refrigerant Flow systems (VRF). The VRF system was compared against a traditional central plant with chillers and boilers. While the central plant was more efficient for space cooling, the amount of carbon emissions from space heating was 474 MT of CO2 compared to 1.9 MT CO2. The reason for the reduction in greenhouse emissions is primarily due to the reduction of combustible fuel for reheat energy. A 4-pipe fan coil system with heat recovery chillers was also investigated but had a much higher first cost associated with exterior piping and valve pits. The decision of an air cooled VRF system eliminated the need for pipe trenching and valve pits while still maintaining heat recovery at the condensing unit.

Each building will have one VRF condensing unit system with heat recovery. The number of indoor units will depend on the number of zones within the building. Each interior zone will be capable of providing energy consumption for 3rd party billing. Buildings that require makeup for exhaust or dehumidification are provided a single zone heat pump for ventilation and additional cooling. Where no heat pump is provided, outside air will be ducted to each of the indoor units through an exterior wall.

For the Casitas and Villas, single zone split heat pumps will be utilized, and outside air will be ducted to the indoor units.

Table 6 provides the estimated cooling load for each of the buildings that will be conditioned.

Mechanical HVAC			
Building Type	**Square Footage**	**SF/Ton**	**Cooling Load (Tons)**
Retail RT1 (Fitness)	35,000	600	60
Retail RT2	9,000	500	20
Retail RT3	9,000	350	30
Retail RT4	13,500	400	30
Retail RT5 (Office)	8,000	400	20
Retail RT6	6,000	350	20
Retail RT7	6,000	350	20
Retail RT8 (Office)	23,500	400	60
Hotel RH1	197,500	600	330
Hotel RH2 (Casitas)	8,500	700	15
Hotel RH3 (Villas)	35,000	700	50
Hotel RH3 (Villa Clubhouse)	750	700	1
Wellness RA1	14,000	400	35
Conference RA2	28,500	400	70
Cabana Clubhouse RA3	750	700	1
F&B / Surf Check in RA4	10,000	350	30
Aussie Surf Club RA5	3,000	600	5
Fieldhouse RA6	2,000	600	3

Table 6

Electrical

Electrical system will be designed to provide adequate power for the project and site, comply with applicable codes and standards, be flexible, energy efficient and allow for future growth.

Main service arrangement and equipment location to be coordinated with the local electrical service provider. Medium voltage distribution (4160V) to be utilized to serve the three unit-substations located throughout the site that are utilized to step down the medium voltage to the utilization voltage of 480Y/277volt. A 5,000KVA substation serves the beach club parcel and wave pool, a 5,000KVA substation serves the hotel parcel and a 1,700KVA substation serves the retail parcel and parking lots.

Photovoltaic panels are carport mounted in parking lots and roof mounted in Fitness Center, Conference Center and Office building. PV system size is approximately 257,000 sq. ft. of panels and can generate up to 5,000 KVA. There will be three PV substations and battery storage banks throughout the site. While battery storage is not a requirement for to conform with the CAP, it is proposed that a battery storage system is integrated into the project to further reduce demand and store unused solar energy for use when solar energy is not available. Three battery storage banks are recommended for a total of 3 megawatt-hours. A breakdown of building electrical demand can be found in table 7.

Parking lot lighting comprise of surface mounted LED fixtures to be mounted under carport structures and LED poles lights throughout the parking lots. 6% of total parking stalls to be prewired for electric vehicle charging stations. Mechanical equipment to be 480/277V. Low voltage transformers and panelboard to be located inside the buildings.

OCEANSIDE PAVILION- SERVICE LOAD CALCULATION					
BUILDING DESIGNATION	PARCELL AREA (SQ.FT.)	LIGHTING (VA/SQ.FT.)	POWER (VA/SQ.FT.)	MECHANICAL (VA/SQ.FT.)	TOTAL CONNECTED LOAD (KVA)
RETAIL					
Retail RT1 (Fitness)	35,000	0.90	1	5	224
Retail RT2	9,000	0.90	2	5	67
Retail RT3	9,000	0.90	2	5	67
Retail RT4	13,500	0.90	2	5	100
Retail RT5 (Office)	8,000	1	2	4	54
Retail RT6	6,000	0.90	2	5	44
Retail RT7	6,000	0.90	2	5	44
Retail RT8 (Office)	23,500	0.80	1	4	136
TOTAL RETAIL KVA					**737**
RESORT HOTEL					
Hotel RH1	197,500	0.91	1	5	1167
Hotel RH2 (Casitas)	8,500	1.23	1	5	57
Hotel RH3 (Villas)	35,000	1.23	1	5	236
Hotel RH3 (Villa Clubhouse)	750	0.91	1	5	5
TOTAL RESORT HOTEL KVA					**1465**
RESORT AMENITY					
Wellness RA1	14,000	0.90	1	5	83
Conference RA2	28,500	1.20	1	5	191
Cabana Clubhouse RA3	750	1.25	1	5	5
F&B / Surf Check in RA4	10,000	0.90	1	5	64
Aussie Surf Club RA5	3,000	1	1	5	19
Fieldhouse RA6	2,000	0.90	1	5	13
BEACH CLUB POOL HEATING POWER					**2200**
WAVE POOL POWER					**5,040**
TOTAL RESORT AMENITY KVA					**7615**
PARKING PARCEL					
PARKING A	138,700	0.25	-	-	35
PARKING B	120,000	0.25	-	-	30
PARKING C	63,500	0.25	-	-	16
PARKING D	9,350	0.25	-	-	2
ELECTRIC CHARGING STATIONS	-	-	-	-	381
TOTAL PARKING PARCEL KVA					**464**
TOTAL RESORT KVA					**10,280**
TOTAL AMPS @ 4160V					**1,428**

Table 7

Plumbing

Oceanside Climate Action plan requires that each building is provided a connection for recycled water integration. The city of Oceanside is upgrading current wastewater treatment facilities and is planning to integrate buildings to optimize the amount of wastewater that may be recycled to replace potable water locations. Reclaimable water may come from the HVAC system, showers, dishwashers, sinks and rainwater.

Natural Gas service is limited to food and beverage locations, fitness center and hotel. The minimum pressure required at each of the buildings is 4.5 psig.

Domestic hot water will be provided through instantaneous electric water heaters.

Pool heating to be provide through electric heat pumps with a minimum Coefficient of Performance (COP) of 5. The project is considering the addition of solar thermal to reduce the demand load for water heating and pool heating. A solar thermal system will be investigated during further development of design documents.

CONCLUSION

Oceanside Pavilion is a multi-use building resort that includes Hotels, Exercise Facilities, Retail, Supermarket, Museum and Food and Beverage building types. Additional site energy usage includes outside gas heaters, a wave pool and pool heating through the use of heat pumps. The project is required to comply with California's 2019 Title 24 Energy Code and must confirm with Oceanside's Climate Action Plan. The climate action plan project checklist lists the CAP requirements and is included in in appendix A for reference. The CAP encourages reduction of combustible energy sources through mandate. The estimated site energy demand for the site is 10 megawatts and total greenhouse emissions of 4,017 MT CO2. Renewable energy will offset the consumption through on-site photovoltaics. The PV system is estimated to produce 5 megawatts of power and reduce greenhouse emissions for the site to 1,315 MT CO2, a 67% reduction. Buildings will reclaim water where possible and a service connection will be provided for future connection to Oceanside's recycled water network.

Further energy reduction may be achieved through the inclusion of using heat rejection for pool heating, natural ventilation and high efficiency system where possible.

APPENDIX A – PROJECT REVIEW CHECKLIST

Development of Project Review Checklist	
CAP Measure	**Project-Level Implementation**
E2—Solar Photovoltaic Promotion Program	Measure E1 would include adoption of a Solar Ordinance for New Development. The Ordinance would require that new developments with 50 or more surface parking spaces to offset 50 percent of energy use through on-site renewable energy sources. As the Ordinance and associated enforcement program will be adopted several months after CAP adoption, the checklist measure includes the Ordinance's requirement for renewable energy. This checklist item would be applicable wherever future development would include 50 or more surface parking spaces and would have a non-negligible electricity demand.
W3—Local Water Supply Development	Measure W3 would include capital improvements to increase the supply capacity of recycled water. While Measure W3 does not specifically call for implementation at the project-level, it is assumed that future development would use recycled water where feasible. The checklist item includes incorporation of service connections for recycled water use; this checklist item would be applicable wherever future development may feasibly offset potable water use with recycled water and where the project is located in a serviceable area.
TL1— Smart Growth Policies	Transportation forecasts are based on the proposed land use pattern from the 2017 General Plan Update that is being prepared concurrently with the CAP. Measure TL1 would include adopting smart growth development policies – specifically, the majority of new development of housing units and employment generating land uses would be sited in Smart Growth Opportunity Areas (SGOAs). Thus, at the project-level, all projects sited outside an SGOA are assumed to develop uses that would be consistent with land use designation and all projects sited inside an SGOA are assumed to develop uses that are consistent with the character of the SGOA type. The minimum SGOA target densities identified by SANDAG are considered the most applicable criteria for determining whether a proposed land use would be consistent with the character of an SGOA type. The set of checklist item includes the limitations on proposed land uses. This set of checklist item would be applicable wherever future development would result in non-negligible vehicle trip generation.

TL2—Expanded Electric Vehicle Charging Infrastructure	Measure TL2 would include adoption of an Electric Vehicle Infrastructure Ordinance. The Ordinance would require all residential, commercial, and industrial development projects to prewire a portion of parking spaces to allow for future installation of electric vehicle charging stations. As the Ordinance and associated enforcement program will be adopted several months after CAP adoption, the checklist measure includes the Ordinance's requirement for prewiring parking spaces. This checklist item would be applicable wherever future development would include parking spaces.
TL3—Preferential Parking Spaces for Zero Emission Vehicles	Measure TL3 would include adoption of a Clean Air Vehicle Parking Ordinance. The Ordinance would require commercial and industrial development projects incorporate 12 percent designated parking spaces for clean air vehicles. As the Ordinance and associated enforcement program will be adopted several months after CAP adoption, the checklist measure includes the Ordinance's requirement for providing preferential parking for clean air vehicles. This checklist item would be applicable wherever future development would include commercial or industrial uses with parking spaces.
TL5—Transportation Demand Management Plans	Measure TL5 would include adoption of a Transportation Demand Management (TDM) Ordinance. The Ordinance would require new or renovated commercial and industrial development projects that would generate more than 100 vehicle trips per day. The Ordinance, associated enforcement program, and specific TDM measures will be adopted approximately a year after CAP adoption. Measure TL5 goals include reducing VMT associated with new commercial and industrial development projects that would generate more than 100 vehicle trips per day by 10 percent. The checklist measure includes the TDM strategies with a point system where each point is estimated to equate to a 1 percent VMT reduction. The number of points associated with implementation of each TDM measure was based on data from the California Air Pollution Control District's (CAPCOA) Report Quantifying Greenhouse Gas Mitigation Measures, A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures (CAPCOA 2010). The dollar amount per point for monthly parking cash-out programs and discounted transit programs was also derived from pertinent study data and mode choice elasticities identified in the report[1,2]. Projects that would achieve 10 points would be anticipated to achieve a 10 percent VMT reduction, and thus would be consistent with the Measure TL5 goal. This checklist item would be applicable wherever future development would include commercial or industrial uses that would generate more than 100 vehicle trips per day.

AF1—Urban Forestry Program	Measure E1 would include adoption of a Green Streets Ordinance. The Ordinance would require that new developments projects incorporate shade trees and establishes a goal of requiring that overall new development projects incorporate an average of 200 additional trees per year. The criteria for determining how many trees each individual development project would need to incorporate would not be established in the Green Streets Ordinance. Until adoption of the Green Streets Ordinance, interim criteria shall be one tree per each single- family residence, one tree per three multi-family residences, and one tree for each 14 jobs. Based on the SANDAG Series 13 Regional Growth Forecast between 2020 and 2030, development in Oceanside is anticipated to result in approximately 367 single-family residences and 2,221 multi-family residences. Based on employment projections developed by Keyser Marston Associates, employment is anticipated to increase by approximately 28,732 between 2014 and 2035. Therefore, it is estimated that average annual development would include at least 37 single- family residences, 221 multi-family residences, and non-residential uses that create 1,368 jobs. Based on this development that meets the interim criteria would result approximately 226 additional trees per year; this would demonstrate consistency with the Measure AF1 goal of planting an additional 200 trees per year. This checklist item would be applicable wherever future development would develop new land uses.

APPENDIX B - INCENTIVES

There are various programs available that will help offset the additional cost associated with the implementation of the measures required. The following are available incentive programs that the project would qualify for.

Savings by Design

This program offsets up to $150,000 from each building project. The project is required to have a compliance model run of 10% better than the current Title 24 baseline model. As of 2019, San Diego only accepts Energy Pro models for compliance.

https://www.savingsbydesign.com/

California Solar Initiative Thermal Program

CSI – Thermal Program is an initiative that encourages the use of solar thermal as opposed to natural gas to heat up domestic hot water.

https://sites.energycenter.org/csi-thermal

Investment Tax Credit

This credit allows a tax deduction of 30% of the cost of installing a solar energy system from the federal taxes. There is currently no cap value; however, as of 2020, the deduction reduces to 26% and down to 22% by 2021.

Self-Generation Incentive Program

This program provides incentive rates for battery storage. It is unknown how long the fund will remain available for Non-Residential buildings. The current rate is $0.22 per watt hour. Battery storage also qualifies for the Investment Tax Credit (ITC).

APPENDIX C – ENERGY MODEL

This section summarizes the energy model that was created and shows the comparison between a central utility plant and stand-alone system. The design criteria were to select a system that was easy to maintain, low first cost and reliable while minimizing greenhouse emissions. Limiting of greenhouse gasses has the highest weight in selection of a system. Other criteria that had a lot of weight in deciding a system was that each system would have to be metered for energy usage.

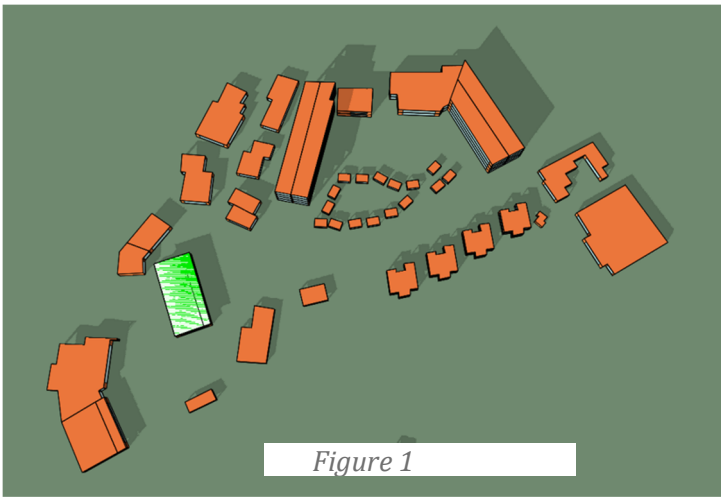


Figure 1

The footprint and heights of the proposed buildings were modeled and were applied Title 24 minimum required efficiencies for the upcoming 2019 Energy Code.

Central Plant

The first system that was investigated was a central plant where water cooled chillers, boilers, cooling towers other utilities would be housed in one central location and chilled and hot water would be distributed throughout the site to each building where there would be a dedicated air handling unit.

At the zone level, there would be Variable Air Volume Boxes attached with Reheat Coils. 55-degree supply air would be sent to each zone from the primary air handling unit and the reheat coils would raise the temperature of the air to meet the required demand from the zone.

Variable Refrigerant Flow – Heat Recovery

The second system that was analyzed was a VRF Heat Recovery system. This system allows for heat to be shuffled between indoor units depending on the demand load. Figure 2 shows a schematic of a VRF system simultaneously heating and cooling spaces in the building.

Wasted reheat is eliminated since the indoor unit will either heat or cool the space in order to meet the space setpoint. This system also eliminates combustible fuel as a source for space heating. Space heating will be provided through the refrigerant using electricity as the fuel source.

Figure 3 is a graphical display of the green house emission of the two system. It can be seen that the central plant option produces almost twice as much carbon emissions when compared to the VRF system.

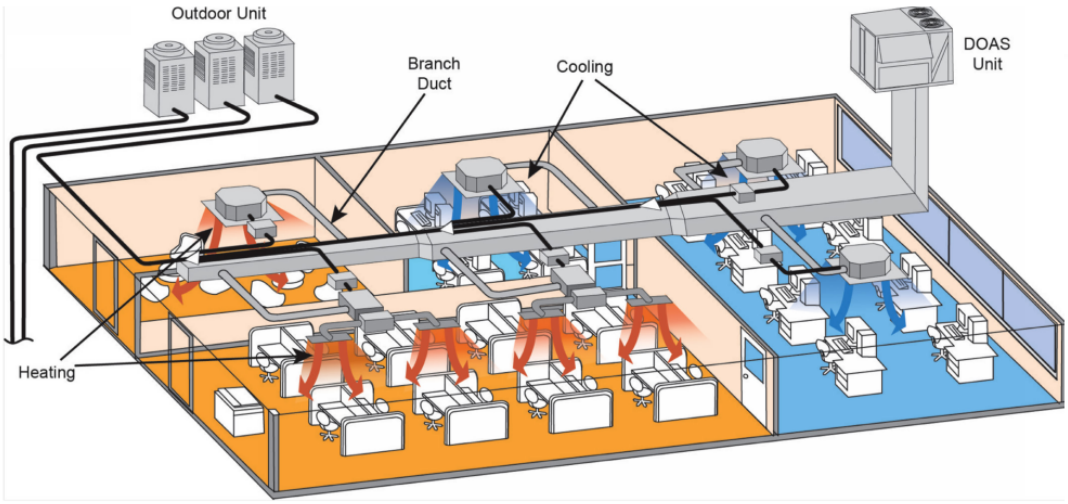


Figure 2 VRF Schematic

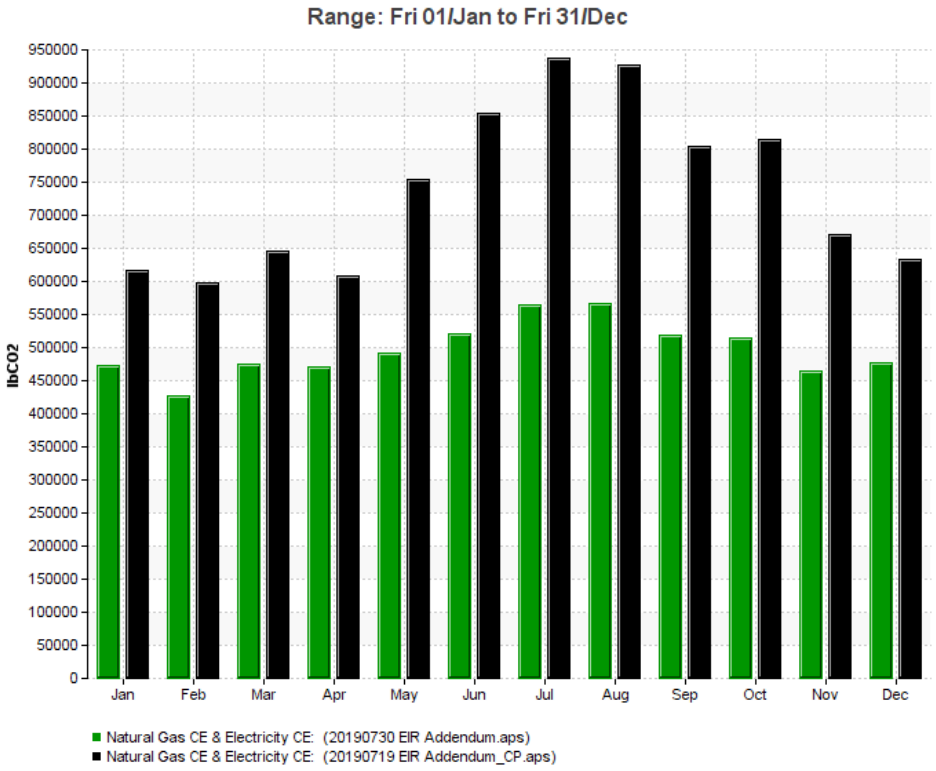


Figure 3 Carbon Emissions by system.