2019 Building Performing Analysis Conference

Building Type: City Hall
Total Floor Area: 90,000 ft²
Location: San Diego, California

**Total Energy Usage**
621 MWh

**Site EUI**
23.9 kBtu/ft²

**Annual Water Usage**
785 kGal

**Annual Electricity Cost**
-0.137 USD/kWh

**Annual Water Costs**
0.077 USD/kWh

**Total Annual Costs**
-5,324 USD

**CPSF**
-0.06 USD/kWh

**Total Energy Generation**
699 MWh

**Net Zero Energy**
78 MWh

**Carbon Equivalent**
-29.6 tons CO₂

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### Model Description

The new 88,740 ft² City Hall proposed for San Diego is envisioned as a center for local governance that can also act as an Emergency Operation Center (EOC) for the area. The PV array can provide enough power for net positive energy during normal operation, but also can enable the building to serve the community during natural disasters.

In addition to being an exemplar of resiliency, the design provides abundant planted outdoor spaces on all floors to increase the occupants' connection to nature, thereby improving health and wellness. The use of mass timber and CLT construction provide additional natural elements while reducing embedded carbon.

To integrate multiple design objectives into the project, the team relied heavily on computational design in Grasshopper, tying parametric design models to performance simulation engines such as Energy Plus and Radiance.

### Energy Savings Strategies

- Self-shading staggered massing and orientation specific local shading reduce solar loads
- Narrow floor plates abundant daylight to offset lighting energy use
- High performance façade
- Cutting edge air cooled heat recovery chillers with low global warming potential refrigerant
- Mixed mode natural ventilation turns off HVAC system
- Recirculating showers reduce domestic hot water energy use

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**Team**

**Team Captain**
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