

ET Summit 2022

Presented by



Decarbonizing Commercial Water Heating Systems

Replacing Natural Gas Boilers with Heat Pumps at a
University Campus



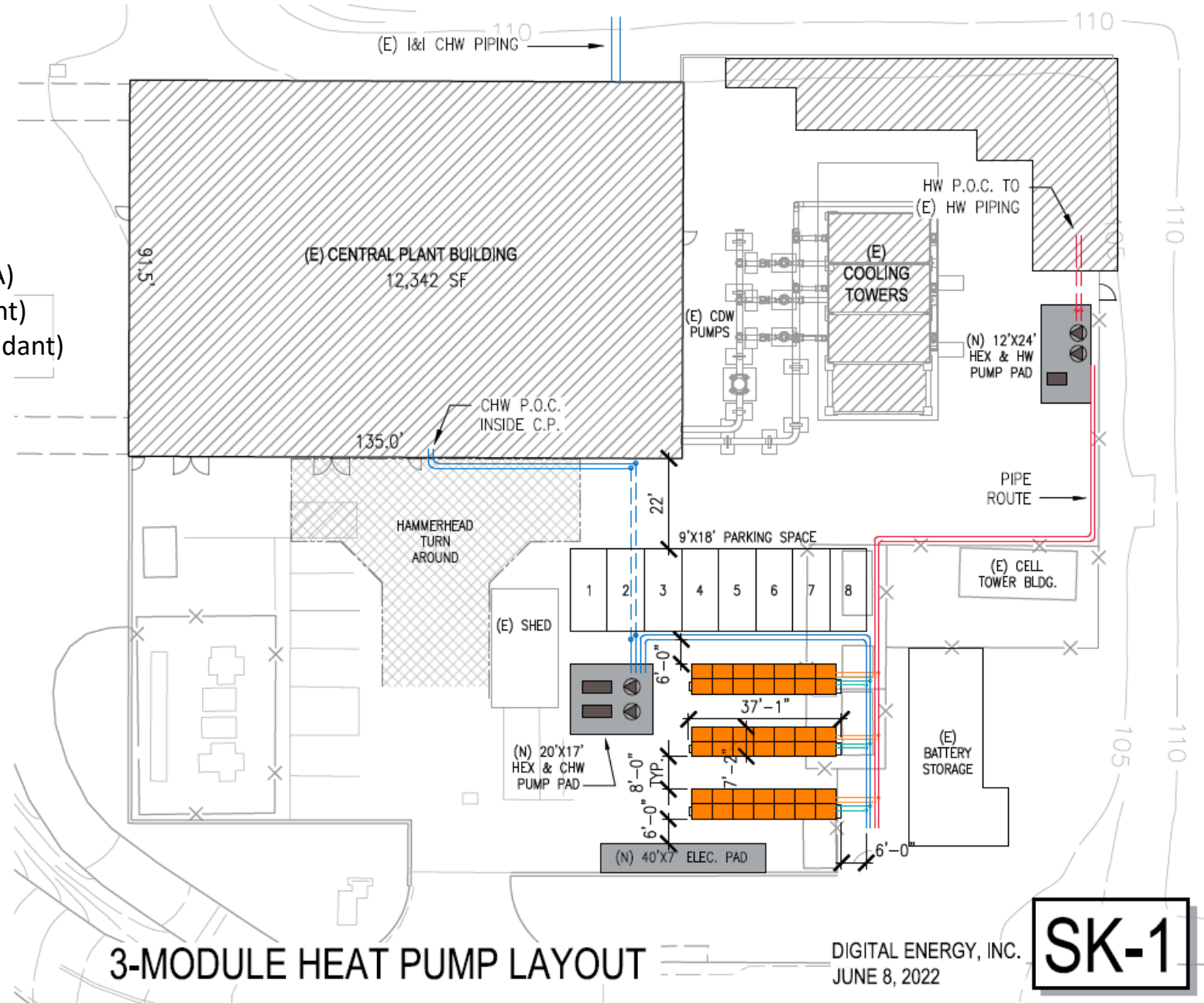
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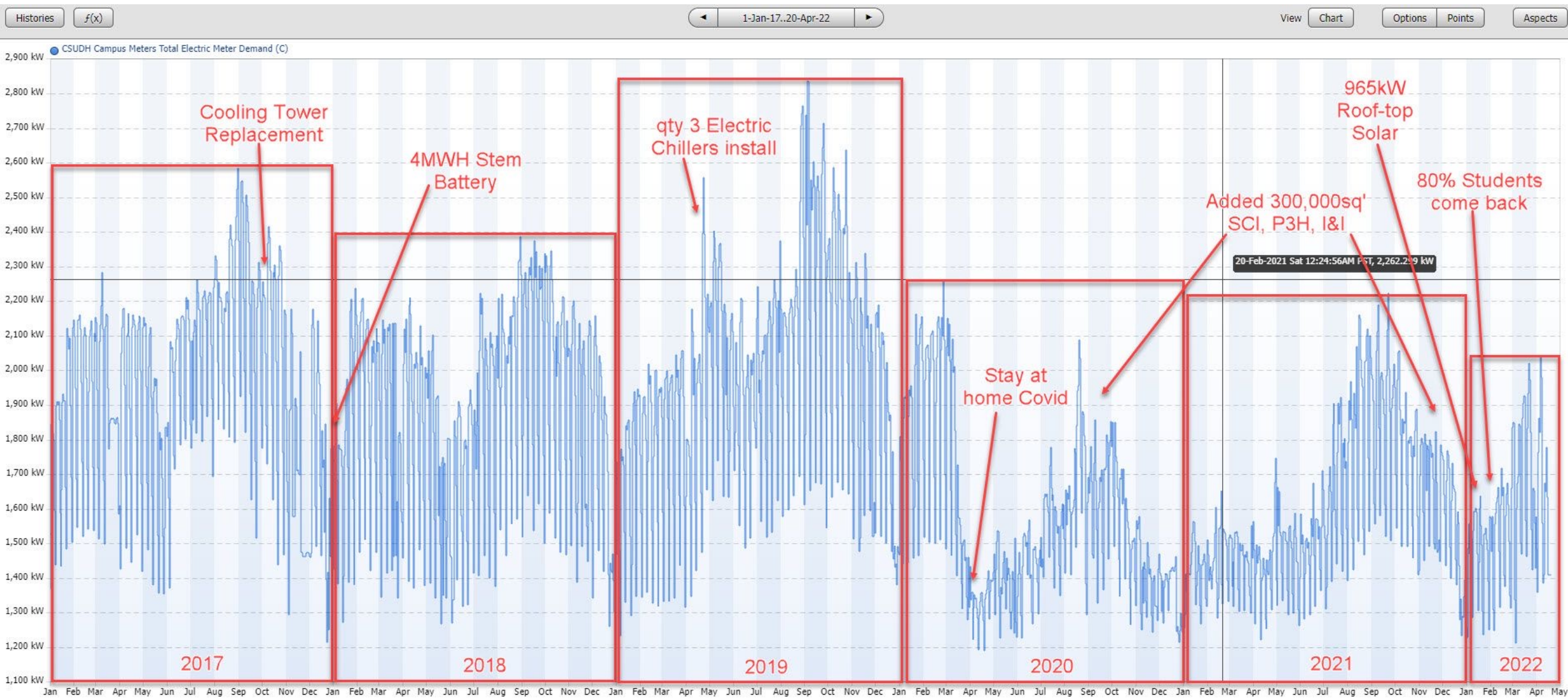
California State University, Dominguez Hills (CSUDH)

Current Design

- 21, 30-Ton Modules packaged into 7-skids (1.26 MVA)
- 2, 30 HP VFD driven Hot water pumps (one redundant)
- 2, 20 HP VFD driven Chilled water pumps (one redundant)
- Net Electrical Installed Load Addition: 1.35 MVA



How We Got Here



How We Got Here

- Replaced Direct Gas fired Absorption Chillers with Electric
 - Reduced gas 65%, increased electricity 7%
- Pneumatic to Digital control on almost all buildings
- Occupancy based room control with LED and smart sensors.
 - Reduced building electricity 50%
- Batteries and Solar
- There isn't one solution but many that all work together
- 21 heat pumps should get rid of 75% of the gas I have left

Learned Through Research

- Learned that many systems that have issues are because flow is not being considered as much as it should. Enough flow and control of flow is critical to a system working properly.
- Added load but the thought is that your chiller load will be much less when you are in full heat pump load.
- It may not be enough to do 100% of your heating load 100% of the time, but it might be enough 80% of the time. Something else will come along later to take care of the last 20%. Don't wait.
- New systems can discharge heating and cooling to water and/or air with the same system. Giving you lots of flexibility in different weather conditions.



**If Better is Possible,
Good is not Enough**

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