## THE CHILES ECOGRID A Microgrid Neighborhood Test Project Adrian Drive John Mooyman I Spring 2021 Regis Drive Senior Project I UC Davis PROJ **Davis Greenway Davis** Cemetery Acessory Dweling Unit Townhouse **Battery Storage** Single Family Detached Smart Controler Stacked Townhouse 6 Mesquite Drive **LEGEND** Green Space 5 Cemetery Connection 2 Revitalized Bioswale 6 Single Story Housing Street Connection Two Story Apartments 4 Greenway Connection **8** Garden Plots **East 8th Street** Section A **Operational Microgrids** Site Location 2411 East 8th Street Davis, California The site is a 12 acre lot of undeveloped land in East Davis. It is zoned for medium density residentia 9+1 and borders the Davis cemetery. It is located about 1.4 miles away from downtown and is situated near 4 parks Commercial Campus Public Institution City/Community ■ Island ☆ Military Microgrid Components The microgrid starts with power Section B generation which can come from diesel generators, solar panels, wind turbines, hydro, or whatever method you can use to create electricity. Once the power is generated, an inverter converts it into usable electricity. The smart controller is the brains of the microgrid and sends power where INVERTER it will best be used. Most of the time, the smart controller will send it to the load or batteries for future use. Any excess power will be sold to the main grid. If not enough power is generated on MART CONTROLLER site, the smart controller can also take power from the main grid in order to meet load demands MAIN GRID **Energy Consumption** Average Monthly Energy Use Chiles Ecogrid W/ ermal & Smart Appl Total (kWh): 263 Chiles Ecogrid W/ Geothermal, Smart Appliand Total (kWh): 623 The average home electrical consumption with 2 electrical vehicles in this neighborhood is about 623kWh per month which is actually above the current average Davis home. With 70,000 this, it is then possible to calculate the amount of solar must be on site. Accounting for peak summer months by increasing 60,000 the demand by 20%, the total monthly neighborhood consumption would be 84,092kWh. By installing solar on the 40.000 30,000 roof with a three foot setback around the sides, we can utilize 27,690 sqft off panels which will generate 84,520kWh per month. There will be an average of 428kWh in excess each month that can be stored or sold to PG&E.