## **EV Charging Requirements**

|                                |  | Hayward's Current<br>Reach Code<br>(% of dwelling<br>units) | 2022 CalGreen<br>(% of parking spaces)   | 2022<br>Model Reach Code                                      | 2022<br>Model Reach Code<br>Affordable Housing  | Option A   | Option B  |
|--------------------------------|--|---|--|---|---|--|---|
| (more t                        | Multi-Family<br>han 20 dwelling units) | 25% Level 2 EV<br>Capable<br>75% Level 2 EV<br>Ready        | 10% Level 2 EV Capable 25% <u>low power</u> Level 2 EV Ready 5% <u>high power</u> Level 2 EVSE | 60% Level 1 EV Ready<br>40% <u>high power</u> Level<br>2 EVSE | 60% Level 1 EV Ready 25% <u>low power</u> Level 2 EV Ready 15% <u>high power</u> Level 2 EVSE | 60% <u>high power</u> Level<br>2 EV Ready<br>40% <u>high power</u> Level | 80% <u>low power</u> Level 2 EV<br>Ready<br>20% <u>high power</u> Level 2<br>EVSE |
|                                | L1 Ready                               |   |  | 60  | 60  |  |   |
|                                | L2 Capable                             | 25  | 15   |   |   |  |   |
|                                | L2 Low Power Ready                     |   | 38   |   | 25  |  | 80  |
| Costs for a                    | L2 High Power Ready                    | 75  |  |   |   | 60   |   |
| 100-unit Multi-Family Project* | L2 High Power EVSE                     |   | 8  | 40  | 15  | 40   | 20  |
|                                | Total Ports                            | 100   | 61   | 100   | 100   | 100  | 100   |
|                                | Total Cost                             |   | \$146,421  | \$194,185   | \$175,635   | \$397,801  | \$273,079   |
|                                | Cost/Port                              |   | \$2,400  | \$1,942   | \$1,756   | \$3,978  | \$2,731   |
|                                | % of dwellings w/access                | 100%  | 40-60%   | 100%  | 100%  | 100%   | 100%  |
|                                | % of total const. cost**               |   | 0.3%   | 0.4%  | 0.4%  | 0.8%   | 0.6%  |

<sup>\*</sup> Costs are estimated for 2022 and do not include the cost of transformers or increase panel capacity. Assuming 1.5 parking spaces per dwelling unit.

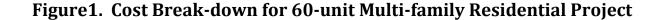
<sup>\*\*</sup> The "% of total construction cost" may be as high as double as what is when accounting for transformers, etc. This is especially true of 'Option A' which includes the highest power requirements.

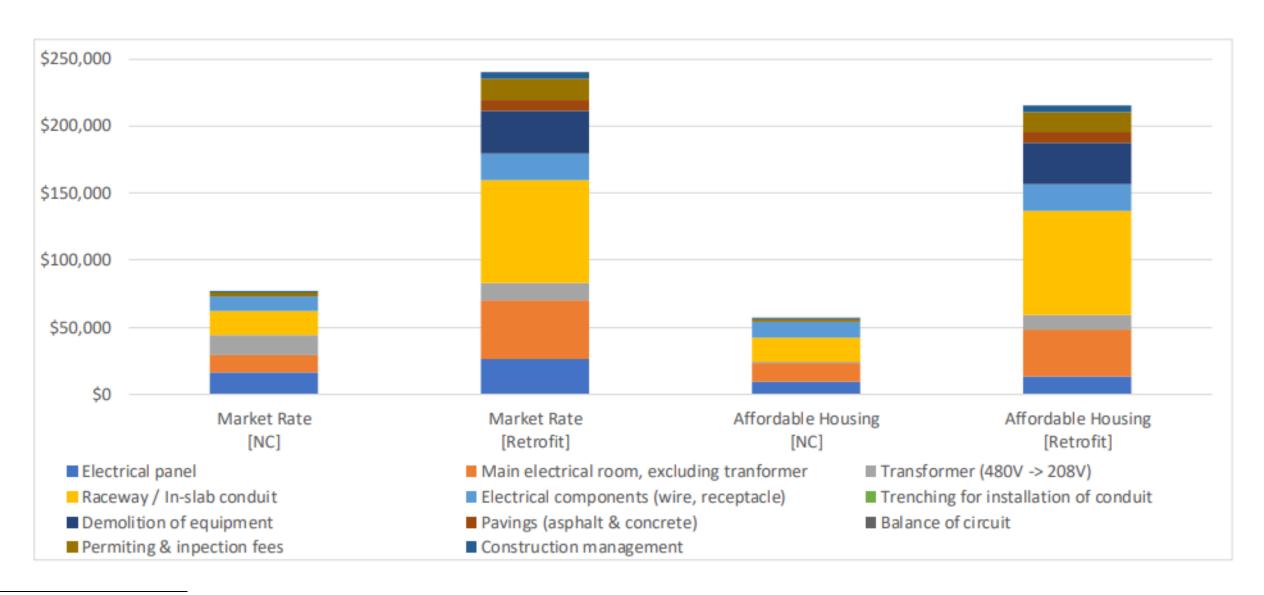
## EV Charging Requirements (continued)

|                                    | 2019 CalGreen   | Hayward's Current Reach<br>Code  | 2022 CalGreen   | Model Reach Code<br>(potential requirements)  | Recommended                                   |
|------------------------------------|---|--|---|---|---|
| Multi-Family ≤20<br>dwelling units | 100% Level 2 EV<br>Ready space  | 10% Level 2 EV Capable 25% <u>low power</u> Level 2 EV Ready (35% total) | 40% <u>high power</u> Level 2<br>EVSE<br>60% Level 1 EV Ready<br>(100% total) | 15% <u>high power</u> Level 2 EVSE; 25% <u>low power</u> Level 2 EV Ready 60% Level 1 EV Ready (100% total) | TBD   |
| Single Family &<br>Townhome        | One Level 2 EV<br>Capable for one<br>parking space per<br>dwelling unit | Two Level 2 EV Ready spaces per dwelling unit                            | No changes from 2019<br>CalGreen  | One Level 2 EV Ready space One Level 1 EV Ready space   | Two Level 2 EV Ready spaces per dwelling unit |
| Non-Res Office                     | 6% Level 2 EV<br>Capable  | 20% Level 2 EVSE;<br>30% Level 2 EV Capable                              | 5% Level 2 EVCS;<br>10% Level 2 EV Capable                                    | 20% Level 2 EVSE;<br>30% Level 2 EV Capable   |   |
| Non-Res Non-Office                 |   | 15% Level 2 EVSE   |   | 10% Level 2 EVSE;<br>10% Level 2 EV Capable   |   |
| Hotel/<br>Motel                    | NA  | NA   | NA  | 5% Level 2 EVSE; 25% <u>low power</u> Level 2 EV Ready  |   |

## **EV Charging Cost Estimates**

The following cost estimates are from a 2019 study1 prepared for Peninsula Clean Energy (PCE) and Silicon Valley Clean Energy (SVCE) analyzing the costs for: 1) a 60-unit multifamily project; 2) a 150-unit multi-family project; and 3) an office building with 60 parking spaces. The costs below are for EV Ready and do include costs for transformers. This study does not include costs for EVSE, and does not include and has a overall 20% contingency to account for ADA compliance. ADA can be a significant source of cost and in this study is only intended to capture a limited scope of ADA compliance.





<sup>&</sup>lt;sup>1</sup> https://bayareareachcodes.org/wp-content/uploads/2020/03/PCE\_SCVE-EV-Infrastructure-Report-2019.11.05.pdf

Table 1. Estimated Incremental Cost of installing EV Infrastructure: 60-unit Multi-family Residential Project

|   | 60-Unit MUD            |                              |                               |                                     |
|---|------------------------|------------------------------|-------------------------------|-------------------------------------|
| Retrofit                                    | Market<br>Rate<br>[NC] | Market<br>Rate<br>[Retrofit] | Affordable<br>Housing<br>[NC] | Affordable<br>Housing<br>[Retrofit] |
| Level 2 Ports Added                         | 9                      | 9                            | 0                             | 0                                   |
| Level 1 Ports Added                         | 45                     | 45                           | 54                            | 54                                  |
| Electrical panel                            | \$15,960               | \$26,008                     | \$9,289                       | \$13,004                            |
| Main electrical room, excluding transformer | \$13,609               | \$43,911                     | \$14,055                      | \$35,193                            |
| Transformer (480V -> 208V)                  | \$14,164               | \$12,743                     | \$1,081                       | \$10,897                            |
| Raceway / In-slab conduit                   | \$18,059               | \$77,247                     | \$18,059                      | \$77,247                            |
| Electrical components (wire, receptacle)    | \$11,366               | \$20,131                     | \$11,307                      | \$20,049                            |
| Trenching for installation of conduit       | \$0                    | \$0                          | \$0                           | \$0                                 |
| Demolition of equipment                     | \$0                    | \$31,940                     | \$0                           | \$30,918                            |
| Pavings (asphalt & concrete)                | \$0                    | \$7,889                      | \$0                           | \$7,889                             |
| Permitting & inspection fees                | \$2,435                | \$15,592                     | \$2,435                       | \$15,592                            |
| Construction management                     | \$549                  | \$4,449                      | \$403                         | \$4,264                             |
| TOTAL                                       | \$76,142               | \$239,909                    | \$56,629                      | \$215,051                           |
| TOTAL (Price per Port)                      | \$1,410                | \$4,443                      | \$1,049                       | \$3,982                             |

NC = New Construction

Figure 2. Cost Break-down for 150-unit Multi-family Residential Project

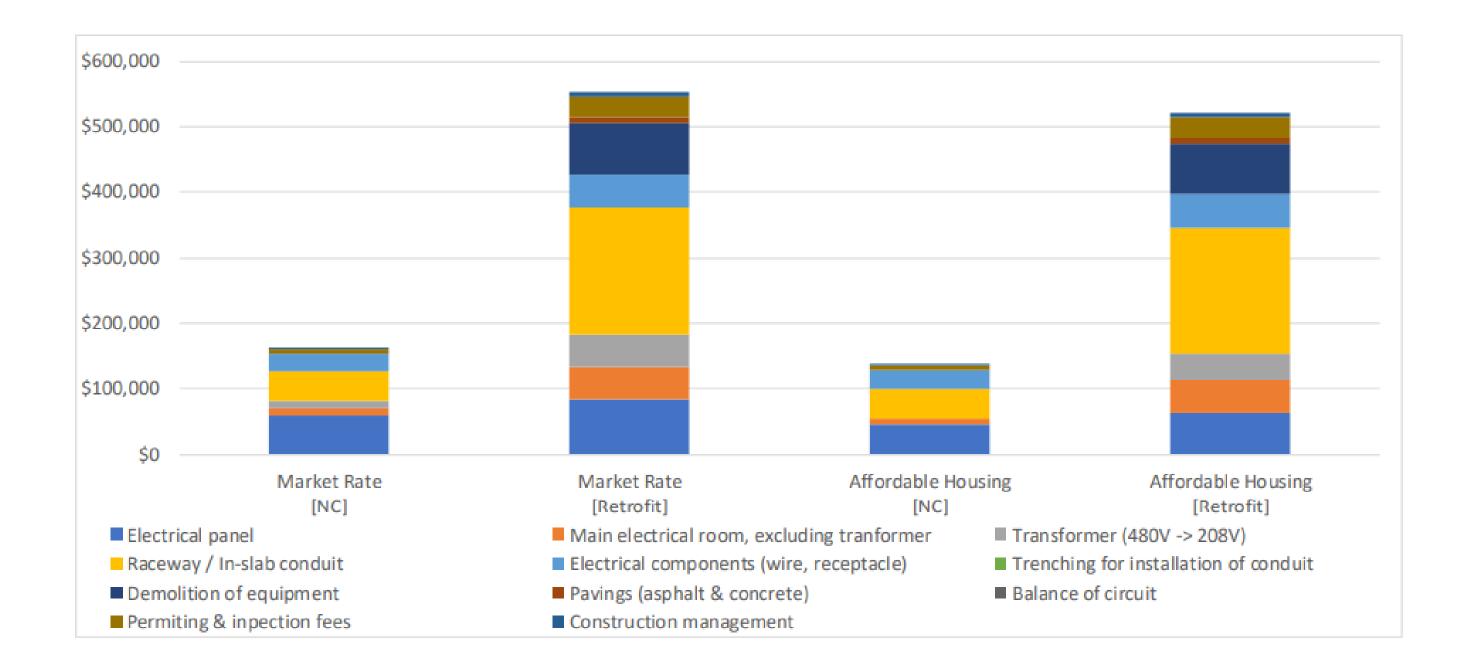


Table 2. Estimated Incremental Cost of installing EV Infrastructure: 150-unit Multi-family Residential Project

|   | 150-Unit MUD           |                              |                               |                                     |
|---|------------------------|------------------------------|-------------------------------|-------------------------------------|
| Retrofit                                    | Market<br>Rate<br>[NC] | Market<br>Rate<br>[Retrofit] | Affordable<br>Housing<br>[NC] | Affordable<br>Housing<br>[Retrofit] |
| Level 2 Ports Added                         | 23                     | 23                           | 0                             | 0                                   |
| Level 1 Ports Added                         | 112                    | 112                          | 135                           | 135                                 |
| Electrical panel                            | \$59,785               | \$83,699                     | \$44,926                      | \$62,896                            |
| Main electrical room, excluding transformer | \$10,059               | \$49,276                     | \$10,059                      | \$49,276                            |
| Transformer (480V -> 208V)                  | \$11,539               | \$49,742                     | \$0                           | \$40,621                            |
| Raceway / In-slab conduit                   | \$45,147               | \$193,116                    | \$45,147                      | \$193,116                           |
| Electrical components (wire, receptacle)    | \$28,062               | \$49,833                     | \$28,407                      | \$50,317                            |
| Trenching for installation of conduit       | \$0                    | \$0                          | \$0                           | \$0                                 |
| Demolition of equipment                     | \$0                    | \$79,850                     | \$0                           | \$77,294                            |
| Pavings (asphalt & concrete)                | \$0                    | \$8,442                      | \$0                           | \$8,442                             |
| Permitting & inspection fees                | \$5,798                | \$33,069                     | \$5,798                       | \$33,069                            |
| Construction management                     | \$1,159                | \$6,655                      | \$964                         | \$5,196                             |
| TOTAL                                       | \$161,550              | \$553,682                    | \$135,301                     | \$520,227                           |
| TOTAL (Price per Port)                      | \$1,197                | \$4,101                      | \$1,002                       | \$3,854                             |

NC = New Construction

Figure 3. Cost Break-down for Office Building with 60 Parking Spaces

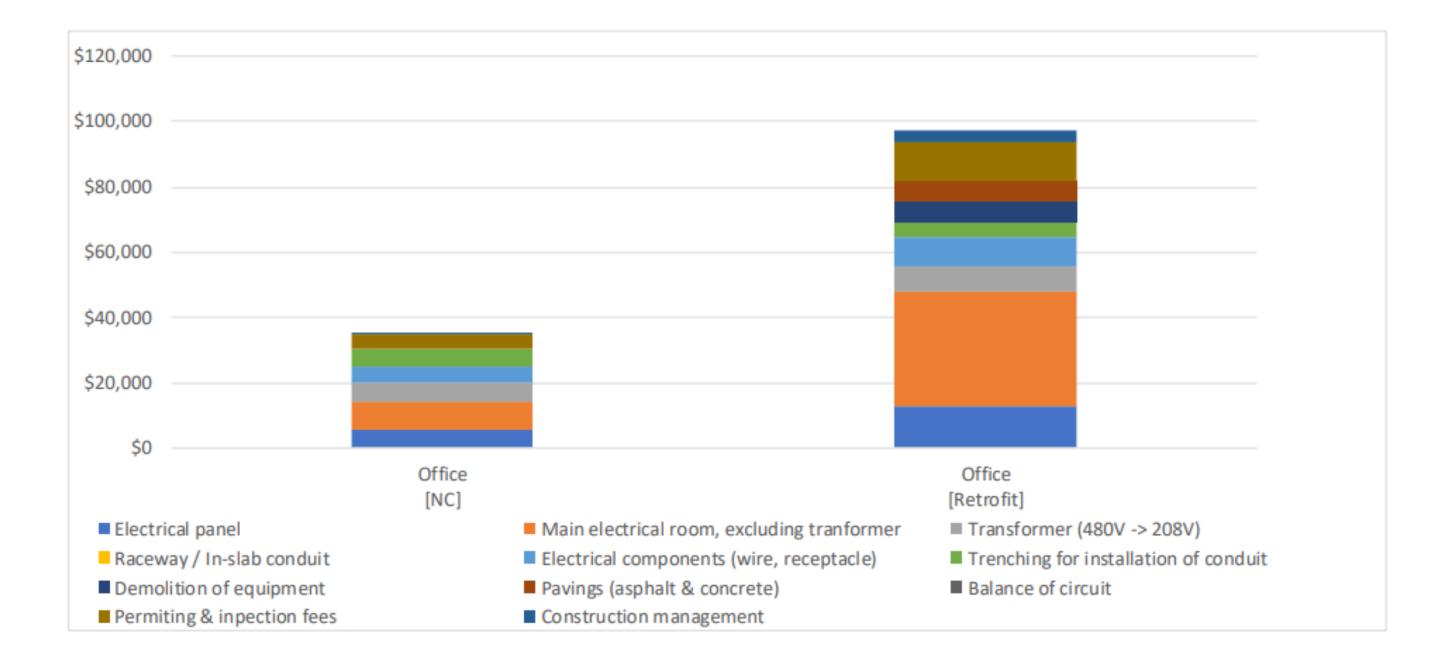


Table 3. Estimated Incremental Cost of installing EV Infrastructure: Office Building with 60 Parking Spaces

|   | 60-Space Office |                      |  |
|---|-----------------|----------------------|--|
| Retrofit                                    | Offce<br>[NC]   | Office<br>[Retrofit] |  |
| Level 2 Ports Added                         | 2               | 2                    |  |
| Level 1 Ports Added                         | 24              | 24                   |  |
| Electrical panel                            | \$5,571         | \$13,004             |  |
| Main electrical room, excluding transformer | \$8,558         | \$35,005             |  |
| Transformer (480V -> 208V)                  | \$5,748         | \$7,786              |  |
| Raceway / In-slab conduit                   | \$0             | \$0                  |  |
| Electrical components (wire, receptacle)    | \$5,285         | \$9,031              |  |
| Trenching for installation of conduit       | \$5,133         | \$4,562              |  |
| Demolition of equipment                     | \$0             | \$6,211              |  |
| Pavings (asphalt & concrete)                | \$0             | \$6,305              |  |
| Permitting & inspection fees                | \$4,448         | \$11,652             |  |
| Construction management                     | \$227           | \$3,414              |  |
| TOTAL                                       | \$34,971        | \$96,970             |  |
| TOTAL (Price per Port)                      | \$1,166         | \$3,232              |  |

NC = New Construction