Evaluation of Colorado Electric Vehicle Group Purchase Programs

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Southwest Energy Efficiency Project
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The Southwest Energy Efficiency Project is a public interest organization dedicated to advancing energy efficiency in Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming. For more information, visit www.swenergy.org.

SWEEP’s Transportation Program seeks to identify and promote the implementation of policies designed to achieve significant energy savings and reductions in greenhouse gas emissions from the transportation sector. SWEEP’s work focuses on two general strategies: reducing vehicle miles traveled and improving vehicle fuel efficiency.

Questions or comments about this report should be directed to Will Toor, Transportation Program Director at the Southwest Energy Efficiency Project, wtoor@swenergy.org.
EXECUTIVE SUMMARY

During the last four months of 2015, Boulder County, Adams County and the City and County of Denver, Colorado partnered to offer their residents a discount on solar panels and electric vehicles (EVs) as part of a group purchase program featuring two solar providers – Sunrun and Custom Solar – and one vehicle dealership – Boulder Nissan.

The program was very successful, resulting in 147 solar photovoltaic (PV) installations with a total of 832 kW and sales of 248 Nissan LEAFs. The EV group purchase program was the first of its kind in the country and resulted in Boulder Nissan selling over four times more LEAFs per month than normal (62 versus 13). Another EV group purchase program launched by Drive Electric Northern Colorado achieved similar success, selling more than six times more LEAFs than during an average month (26 versus 4).

Over the course of the program, a single dealership, Boulder Nissan, alone accounted for 5% of all LEAF sales in the country. This is particularly impressive considering it is located in a county which accounts for less than one-tenth of one percent of the U.S. population. During November and December when both EV group purchase programs were active, Boulder and Larimer Counties, which make up less than two-tenths of a percent of the U.S. population, accounted for 5.7% of nationwide Nissan LEAF sales.

One important piece of information learned from surveys of program participants is that only 28% of EV purchasers were already intending to buy an EV prior to the program. This indicates that the program did not simply encourage people who were already considering buying an EV to make the decision to do so; it seems to have brought in many new customers who otherwise would not have considered purchasing an EV.

Some of the keys to success of EV group purchase programs as documented in this evaluation include:

- An engaged dealership with at least one dedicated EV salesperson
- Dealership plans to handle greater than expected inventory
- Active outreach by local governments, employers and other partners
- Coverage by local media outlets
The most common suggestion from program participants on how to improve the program was to increase outreach and advertising so that more people would know about the program. From those who ended up not purchasing an EV, the most common suggestion for improvement was to have more participating dealerships offering more EV models.

This evaluation will focus primarily on the program led by Boulder County, but will also include brief summaries from the other three pilots to date in Northern Colorado, Salt Lake City and San Francisco.

“We have wanted to get an electric car for some time now, but we just couldn’t make it work financially. Solar Benefits Colorado removed these barriers and made it practical and easy for us to purchase an electric vehicle. We’re very happy with our new Nissan LEAF!” ~Vivienne Jannatpour, Boulder County
I. INTRODUCTION

During the fall of 2015, a coalition of local governments in the Denver metro area launched the nation’s first combined solar and electric vehicle (EV) group purchase program, dubbed Solar Benefits Colorado (SBCO). This case study profiles how the program was structured, how outreach was conducted, and the impact on the local electric vehicle market.

The first solar group purchase program in the country, Solarize, was organized in Portland, Oregon in 2010.1 This effort was initiated by a neighborhood group and later expanded citywide by the City of Portland with funding from the U.S. Department of Energy. This effort led to a 300% increase in solar installations in Portland between 2009 and 2010.

The basic elements of Solarize included a competitive selection process to choose one or more solar contractors, an outreach effort lead by local government or community organizations, and a limited time offer to drive people to act quickly.

The success of the Portland program led many other communities to develop similar programs for solar PV. Different areas developed local variations, with some programs focusing on particular neighborhoods, some on entire communities, and some on employees of participating organizations.

In spring of 2015, Boulder County participated in a joint study with the City of Boulder and the University of Colorado to research options for supporting the local EV market. After this study, the County decided that its first action step would be to expand the solar group purchase model into a pilot solar and EV group purchase program.

II. COMPONENTS OF THE GROUP PURCHASE PROGRAM

Program partners

Boulder County served as the lead agency responsible for organizing the program, after Boulder County and the City of Boulder jointly funded an analysis of steps that they could take to increase the uptake of EVs in their communities. One of the study recommendations was the creation of a pilot group purchase program for municipal employees. Boulder County turned to Vote Solar, who had already worked with the County on solar group purchase programs. Vote Solar and the County jointly came up with the idea of a broader pilot program that would try out an EV and solar group purchase program for the entire community. The Southwest Energy Efficiency Project (SWEEP) provided technical assistance.

Other local governments participated as program partners, including Adams County, Denver, the towns of Lafayette, Louisville, and Nederland, the Boulder Valley School District (BVSD), the University of Colorado-Boulder (CU-Boulder), the National Center for Atmospheric Research (NCAR) and the University Corporation for Atmospheric Research (UCAR). Participants agreed to provide outreach to their constituents.

SBCO was promoted to residents of the three participating counties, but residents of other Colorado counties were also able to take advantage of the deal.

**Vendor selection**

Vendor selection is a critical part of the process. The way that SBCO was organized, two requests for proposals (RFPs) were developed, one to select solar contractors and one to select EV providers. The solar contractors selected to participate in the program were Sunrun (to serve customers within Xcel Energy's service territory) and Custom Solar (to serve customers from Lyons, Longmont and customers of Platte River Power Authority).

The EV RFP was distributed to automobile manufacturers, and local dealerships, as it was not known which level of the auto industry would take the lead. The RFP asked respondents to specify the make and model of EVs they would provide and the discounted price they would offer to participants for both purchase and a two- or three-year vehicle lease. In addition, the RFP asked respondents to describe the financing options and any other financial incentives (such as access to free charging) they would offer. The RFP also asked for a description of the selected vendor's approach to customer service and to assuring availability of inventory. The RFP specified that the deal was to include only new vehicles.²

While a number of different automakers expressed interest in responding, only Nissan submitted a response to the RFP. The response came from one dealership, Boulder Nissan, but it combined discounts offered by the dealer with discounts offered by Nissan North America.

"From start to finish there was no pressure from Boulder Nissan. The staff was extremely informed and knowledgeable about the product." ~Joe, Weld County

Vote Solar set up a web-based portal for people to sign up for the EV or the solar PV program (they could also sign up for both). Registrants’ information was then passed on to Sunrun or Boulder Nissan so the vendors could conduct outreach to the participants via email and phone.

The initial concept was that the program would be open through the end of September; however, demand was so high that it was extended through the end of December 2015.

² The program focused on new vehicles for a number of reasons. First, while local governments were expressly not endorsing the vehicles, they were less comfortable with being affiliated with used vehicle sales for which there would be less quality control. Also, there was a challenge in determining the discount and standard pricing as all used vehicles would vary due to age, mileage and wear and tear.
The Deal

The deal that was offered covered three varieties of 2015 Nissan LEAFs. The base offer was for the 2015 Nissan LEAF S with Quick Charge. The MSRP was $31,810; after a discount of $8,349, the group purchase price was $23,461. $5,000 of the discount came from Nissan North America and $3,349 came from Boulder Nissan. The same discount was also offered for the higher end models: the LEAF SV with an MSRP of $34,460 and the LEAF SL with an MSRP of $36,365.

“I thought it was great. The financial incentives convinced me to give these vehicles a try and I’m loving my car.” ~Bill, Boulder County

In addition, Boulder Nissan offered 0% financing over 72 months (to customers with qualifying credit) and free charging at their fast-charge network for 24 months after purchase.

Leasing was also included as an option, but the financial incentives offered were not as large, and very few customers chose to lease rather than purchase a vehicle.

In communication to the public about the program, a core message was how the combination of the group discounts with state and federal tax credits made a new Nissan LEAF very affordable.

<table>
<thead>
<tr>
<th>LEAF model</th>
<th>S</th>
<th>SL</th>
<th>SV</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSRP</td>
<td>$31,810</td>
<td>$34,460</td>
<td>$36,365</td>
</tr>
<tr>
<td>Group Discount</td>
<td>$8,349</td>
<td>$8,349</td>
<td>$8,349</td>
</tr>
<tr>
<td>Federal Tax Credit</td>
<td>$7,500</td>
<td>$7,500</td>
<td>$7,500</td>
</tr>
<tr>
<td>State Tax Credit</td>
<td>$3,831</td>
<td>$3,831</td>
<td>$3,831</td>
</tr>
<tr>
<td><strong>Net Price</strong></td>
<td><strong>$12,130</strong></td>
<td><strong>$14,780</strong></td>
<td><strong>$16,685</strong></td>
</tr>
</tbody>
</table>

Compared with an average cost of over $33,000 for a new light duty vehicle in 2015, this deal offered significant savings.\(^3\) It made a new Nissan LEAF essentially the same price as the cheapest gasoline burning vehicle on the market at the time: a new Nissan Versa, which had an MSRP of $11,990 in 2015. With electricity costing the equivalent of $1.07 per gallon,\(^4\) EVs provide their owners with hundreds of dollars of fuel savings each year (even with gas prices below $2 per gallon) in addition to reduced maintenance costs.

Both solar PV providers offered customers a price of $3.50 per installed watt along with an incentive of $250 (Custom Solar) or $750 (Sunrun) for each signed contract.

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III. OUTREACH STRATEGY

Outreach was coordinated by Boulder County, with each participating city or county taking the lead on outreach efforts to their employees and residents and each participating employer taking the lead on outreach to their own employees.

Vote Solar developed a web portal that allowed residents to learn about the program, and to sign up for the program online. Vote Solar transmitted these sales leads to the EV and solar vendors. However, as the program got significant media attention, many customers went directly to Boulder Nissan without first signing up on the web; in fact, about half of the vehicles were purchased by customers who never used the web portal.

Following is a summary provided by Boulder County listing all the planned and actual outreach actions that were undertaken by program partners.

Planned Outreach

**Internal** (employees)

- Email (department, personal or organization wide)
- Staff leads sharing the info
- Internal newsletter (general, wellness, etc.)
- Internal organization website
- Employee ambassadors or champions

**External** (the greater community)

- Press release (stories)
- Neighborhood websites,
- Social media
- Events
- Newsletters
  - Leverage existing services (water bill, business chambers, recreation center, special interest groups like open space, energy, or schools)
- Partners
  - Share with partners and ask them to disseminate
  - Create competition
- Online ads
Actual Outreach by Each Partner

Lafayette
- Email blast to Lafayette residents
- Table at Lafayette Art Night Out

Adams County
- Fliers, information about the program, and requests for people to share the info with their community networks were sent to the planning departments in the communities of Brighton, Westminster, Thornton, Northglenn, Federal Heights, Aurora and Arvada
- All-county email and posting on employee intranet
- Information about the program posted on the homepage of Adams County’s website
- Fliers and info sent to Anythink library for distribution at their branches and upcoming events
- Fliers and info distributed via the Community and Economic Development Department’s contact networks and the Community Resource Network

Denver
- Presentations to city departments
- Emailed all past Denver Energy Challenge (DEC) participants
- Included info in DEC weekly mailers
- Emailed all registered neighborhood organizations to offer to give presentations and introduce the program (they already received the press release).
- Sent info to all City Council aides for inclusion in council members’ newsletters
- Prepared a blurb for the Mayor to discuss in his weekly address
- Table in the Webb Building in September and October
- Bilingual workshop with the Barnum Neighborhood
- Table at Denver Drive Electric event on September 12
- Created a poster and post cards for events/giveaways, to keep at the Webb Building info desk, and for departmental Public Information Officers to print and hang in offices

BVSD
- Included information about the program in the all staff electronic newsletter

Boulder County
- Story in Daily Camera
- Sent newsletter to Boulder County Employees
- Sent out an organization-wide email from the Sustainability Coordinator, letting employees know about the offerings
- Planned a workshop for Boulder County employees and residents
- Sent a newsletter through Partners for A Clean Environment (Boulder County’s sustainable business program) to businesses letting them know about SBCO and asking for their help in spreading word to employees
- Sent an EnergySmart newsletter highlighting SBCO to 13,000 participants
- An internal website spotlight
- Blogs for Boulder Home and Garden and Boulder Mag
- Contacted local non-profits asking help with outreach
- Composed an email showcasing employees who have purchased an EV
IV. RESULTS OF THE PROGRAM

Sales of EVs and Solar PV Systems

With a total of 248 vehicles sold, the program had a significant impact on LEAF sales in the area. Between September and the end of the year in 2013 and 2014, there were 64 and 97 Nissan LEAF sales respectively in the three participating counties. During the same period in 2015, 204 LEAFs were sold in those three counties as part of the Solar Benefits Colorado program. While the program’s outreach was focused on the three participating counties, any Colorado resident was able to purchase a LEAF from Boulder Nissan at the discounted rate. This is why the map (Figure 1) shows LEAF sales from thirteen total Colorado counties. At this point in time, EV sales data by county is not yet available for 2015, so we cannot yet quantify how the program impacted sales of other makes or sales by other dealers in the area. Across the entire state of Colorado, 353 LEAFs were sold in 2014.

“We are super happy with the program and really grateful to live where people will create and maintain this kind of project. Thank you!” ~Lee, Boulder County

There is some evidence from the survey conducted by SWEEP that the program encouraged additional sales. Of the 54 survey respondents who did not buy an EV through the program, 10 purchased an EV outside of the program, five purchased a new LEAF at another dealership, three purchased a different model of EV and two bought used LEAFs. In addition, Nigel Zeid at Boulder Nissan reported that LEAF sales at Nissan dealerships across the region rose over the course of the program.

5 While there were a total of 248 sales through the program, data is unavailable for four of these purchases; therefore, most of the analysis that follows will only include the 244 sales for which there are records.
6 Approximately 98% of the program’s transactions were sales, not leases. This is higher than the historical data available from the Colorado Department of Revenue, which estimates that statewide about 82% of EV transactions (or at least those applying for a tax credit) are sales.
7 Sunrun also allowed any potential customer to sign up if they were in Xcel Energy Colorado’s service territory.
8 Surveys were sent to a total of 330 program participants. See a detailed summary of responses in the Appendix.
Figure 1 | Ratio of LEAF Sales to PV System Sales by Owner’s County of Residence

The numbers are even more impressive for Boulder County, where the program’s dealership was located. During the last four months of the year in 2013 and 2014, 33 and 52 LEAFs respectively were sold in Boulder County. In 2015, LEAF sales more than tripled compared to 2014, reaching 173 sales. This significant increase is especially notable when compared to the national trend in EV and LEAF sales in 2015. Over the last four months of 2015 compared to 2014, national EV sales increased 8% (although over the entire year there were actually 4% fewer sales in 2015 than in 2014) and LEAF sales decreased 56%. Over the course of the program, Boulder County, which comprises less than one-tenth of one percent of the U.S. population, alone accounted for 3.5% of all LEAF sales in the country.

Figure 2 shows how sales of LEAFs in the three counties compared during the last four months of 2013, 2014 and 2015 during the SBCO. While final numbers are not available, it is likely that there were a number of additional LEAF and other EV sales in Denver and Adams Counties over this period.

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Due to the success of the program, Boulder County is already planning to put forward another group purchase program in the spring of 2016 and they have already received interest from other dealers and manufacturers about participating.

The solar PV program was also successful, resulting in 147 installations totaling 832.4 kW. Based on SWEEP's survey of program participants (see Appendix for detailed summary), at least 19 people purchased both an EV and a PV system. Of these, 11 sized their PV system so that it would supply enough electricity to both their home and their new LEAF.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Total Program PV Installations by County</th>
</tr>
</thead>
<tbody>
<tr>
<td>County</td>
<td>PV Installations</td>
</tr>
<tr>
<td>Adams</td>
<td>13</td>
</tr>
<tr>
<td>Boulder</td>
<td>87</td>
</tr>
<tr>
<td>City and County of Denver</td>
<td>38</td>
</tr>
<tr>
<td>Other Counties</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>147</td>
</tr>
</tbody>
</table>
Economic Benefits of the Program to Local Economies

The sale of these new Nissan LEAFs brought a number of economic benefits to the local economies. Each EV owner could receive the maximum federal tax credit of $7,500 per vehicle, bringing up to $1.8 million into the local and state economies. The Colorado state tax credit will also bring funds to the local economies where the vehicles are registered.

<table>
<thead>
<tr>
<th>County</th>
<th>Sales</th>
<th>$7,500 Federal Tax Credit</th>
<th>$3,831 State Tax Credit</th>
<th>Total State and Federal Tax Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams</td>
<td>10</td>
<td>$75,000</td>
<td>$38,310</td>
<td>$113,310</td>
</tr>
<tr>
<td>Boulder</td>
<td>173</td>
<td>$1,297,500</td>
<td>$662,763</td>
<td>$1,960,263</td>
</tr>
<tr>
<td>Broomfield</td>
<td>8</td>
<td>$60,000</td>
<td>$30,648</td>
<td>$90,648</td>
</tr>
<tr>
<td>Denver</td>
<td>21</td>
<td>$157,500</td>
<td>$80,451</td>
<td>$237,951</td>
</tr>
<tr>
<td>Douglas</td>
<td>3</td>
<td>$22,500</td>
<td>$11,493</td>
<td>$33,993</td>
</tr>
<tr>
<td>Eagle</td>
<td>2</td>
<td>$15,000</td>
<td>$7,662</td>
<td>$22,662</td>
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<tr>
<td>Garfield</td>
<td>7</td>
<td>$52,500</td>
<td>$26,817</td>
<td>$79,317</td>
</tr>
<tr>
<td>Gilpin</td>
<td>1</td>
<td>$7,500</td>
<td>$3,831</td>
<td>$11,331</td>
</tr>
<tr>
<td>Jefferson</td>
<td>8</td>
<td>$60,000</td>
<td>$30,648</td>
<td>$90,648</td>
</tr>
<tr>
<td>Larimer</td>
<td>4</td>
<td>$30,000</td>
<td>$15,324</td>
<td>$45,324</td>
</tr>
<tr>
<td>Pitkin</td>
<td>1</td>
<td>$7,500</td>
<td>$3,831</td>
<td>$11,331</td>
</tr>
<tr>
<td>Routt</td>
<td>1</td>
<td>$7,500</td>
<td>$3,831</td>
<td>$11,331</td>
</tr>
<tr>
<td>Weld</td>
<td>5</td>
<td>$37,500</td>
<td>$19,155</td>
<td>$56,655</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>244</td>
<td><strong>$1,830,000</strong></td>
<td><strong>$934,764</strong></td>
<td><strong>$2,764,764</strong></td>
</tr>
</tbody>
</table>

While the state government spent just over $1 million for the program’s LEAFs, there was also $228,000 of state sales tax coming to the state government as a result of these vehicle sales. In addition, each vehicle will pay approximately $1,500 in ownership taxes over the first four years of its life and will also pay local use taxes.

All of these benefits came at a relatively modest investment of resources. Boulder County estimates that they allocated a total of 165 hours of staff time and had out-of-pocket expenses of $650. For the northern Colorado program, Drive Electric Northern Colorado (DENC) allocated about 40 hours of staff time and had no out-of-pocket expenses.

10 Because the federal tax credit is based on an individual’s tax liability and is non-refundable, it is possible that some LEAF purchasers would not receive the maximum federal tax credit.

11 Municipal governments will also collect use taxes from registration of the new vehicles, but data on all of the sales is only available on the County level.
Table 4 | Local Taxes Collected by County Governments Due to LEAF Sales

<table>
<thead>
<tr>
<th>County</th>
<th>Sales</th>
<th>Use Tax Collected</th>
<th>Ownership Tax Collected (First 4 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams</td>
<td>10</td>
<td>$0</td>
<td>$15,412</td>
</tr>
<tr>
<td>Boulder</td>
<td>173</td>
<td>$54,206</td>
<td>$266,627</td>
</tr>
<tr>
<td>Broomfield</td>
<td>8</td>
<td>$10,561</td>
<td>$12,330</td>
</tr>
<tr>
<td>Denver</td>
<td>21</td>
<td>$24,382</td>
<td>$32,365</td>
</tr>
<tr>
<td>Douglas</td>
<td>3</td>
<td>$954</td>
<td>$4,624</td>
</tr>
<tr>
<td>Eagle</td>
<td>2</td>
<td>$0</td>
<td>$3,082</td>
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<tr>
<td>Garfield</td>
<td>7</td>
<td>$0</td>
<td>$10,788</td>
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<tr>
<td>Gilpin</td>
<td>1</td>
<td>$0</td>
<td>$1,541</td>
</tr>
<tr>
<td>Jefferson</td>
<td>18</td>
<td>$0</td>
<td>$12,330</td>
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<tr>
<td>Larimer</td>
<td>4</td>
<td>$827</td>
<td>$6,165</td>
</tr>
<tr>
<td>Pitkin</td>
<td>1</td>
<td>$159</td>
<td>$1,541</td>
</tr>
<tr>
<td>Routt</td>
<td>1</td>
<td>$318</td>
<td>$1,541</td>
</tr>
<tr>
<td>Weld</td>
<td>5</td>
<td>$0</td>
<td>$7,706</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>244</td>
<td><strong>$91,408</strong></td>
<td><strong>$376,051</strong></td>
</tr>
</tbody>
</table>

**Media Coverage**

News of the program was picked up by a number of media outlets, both local and nationwide. While we do not know specifically which news stories had the most impact in getting people to participate in the program, we do know from the survey of participants that news stories were the top way that people heard about the program. Based on the number of news sources that are local to Boulder County (five of the twelve stories below), it may be appropriate to assume that the multiple, locally-focused media stories were one factor helping to increase the number of participants in Boulder County. Anecdotally, the story in the Daily Camera that appeared in the program’s first week was very effective at raising awareness.

The best gauge of the effectiveness of these outreach campaigns are responses from program participants about how they heard about the program; this is discussed more fully in the “Lessons Learned” section below.
<table>
<thead>
<tr>
<th>Outlet</th>
<th>Article Title</th>
<th>Date of Story</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMI Outlet</td>
<td>What Electric Vehicles Can Learn from the Solar Market</td>
<td>10/29/2015</td>
<td><a href="http://blog.rmi.org/blog_2015_10_29_what_electric_Vehicles_can_learn_from_the_solar_market">http://blog.rmi.org/blog_2015_10_29_what_electric Vehicles_can_learn_from_the_solar_market</a></td>
</tr>
</tbody>
</table>
V. WHY THE SUCCESS IN BOULDER COUNTY VERSUS ADAMS AND DENVER COUNTIES?

Prior to the SBCO program, Boulder County demonstrated that it was a strong market for EVs. Despite having a smaller population than Denver and Adams County, it consistently registered a greater number of EVs than either of the larger counties during the September to December timeframe in 2013 and 2014. This higher level of EV adoption would explain part of the relative success that Boulder County enjoyed as part of the SBCO compared to Adams County and Denver.

In 2013 and 2014, Boulder County already had a much higher rate of LEAF sales per capita than Adams County and Denver. However, the SBCO dramatically increased Boulder County’s advantage in per capita sales. Counting only vehicles that were sold as part of the program, Boulder’s per capita sales rate tripled during the course of the SBCO compared to 2013 and 2014, as shown in Figure 2 above. The rate is likely even higher if one adds in sales of other EVs over this time period.

Table 6 | Program Signups Compared to Sales by County

<table>
<thead>
<tr>
<th>County</th>
<th>% of EV Signups</th>
<th>% of EV Sales</th>
<th>% of PV Signups</th>
<th>% of PV Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams</td>
<td>8%</td>
<td>4%</td>
<td>12%</td>
<td>9%</td>
</tr>
<tr>
<td>Boulder</td>
<td>58%</td>
<td>71%</td>
<td>53%</td>
<td>59%</td>
</tr>
<tr>
<td>Denver</td>
<td>21%</td>
<td>9%</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td>Other Counties</td>
<td>13%</td>
<td>16%</td>
<td>9%</td>
<td>6%</td>
</tr>
</tbody>
</table>

One of the factors that likely contributed to much higher rates of LEAF sales in Boulder County compared to Denver and Adams Counties is the convenient location of Boulder Nissan for Boulder County residents. One way to try to assess the impact of the dealerships location is to compare the distribution of both program signups and sales between the PV systems and the EVs. While it was more convenient for Boulder County residents to go to Boulder Nissan, there is no convenience advantage in the solar PV program because Sunrun would go the participants’ house regardless of which county they lived in.

The first piece of evidence to support the idea that the location of Boulder Nissan made a difference is that while Boulder County residents still made up the majority of the PV sales, the percentages of PV sales in Adams and Denver Counties are quite a bit higher than their percentages of EV sales.

Second, Boulder County had a higher percentage of EV sales compared to the number of people who signed up for the EV program (71% compared to 58%) while Denver and Adams Counties both had lower sales compared to the number of signups. For PV sales compared to signups, while again Boulder County residents had a higher adoption rate than the percentage of signups would suggest, there was less of a drop-off in Adams County (compared to EVs) and no drop-off at all in Denver.
This suggests that initial interest in the EV program may have been tempered in Adams and Boulder Counties by the inconvenience of traveling to Boulder Nissan to complete the purchase of the LEAF.

There are at least two other factors that may have increased sales in Boulder County relative to those in Denver and Adams Counties. Several large employers in Boulder County (CU-Boulder, BVSD, NCAR and UCAR) conducted outreach to their employees. And finally, as noted above, a significant amount of the media coverage was focused in local Boulder publications, giving extra exposure to Boulder County residents.

VI. INFORMATION FROM OTHER EV GROUP PURCHASE PROGRAMS

Fort Collins / Drive Electric Northern Colorado Program (DENC)

In November, another group purchase program began in the Fort Collins area. The program was administered by DENC and offered participants the opportunity to purchase a new 2015 Nissan LEAF S for approximately $11,600 after state and federal tax credits.

The program was initially targeted to employees of businesses that were a part of DENC’s Workplace Charging Program. However, because of the positive response from the Workplace Charging partners, it was opened to the general public on the Friday following Thanksgiving as a “Black Friday” promotion. At the time of the program release, there were 18 Workplace Charging partners employing over 30,000 northern Colorado residents. Two more large employers joined the Workplace Charging Challenge to open the group purchase program to their employees. DENC had done a lot of outreach to these employers over the last few years and had developed a community of EV advocates within each company. Examples of outreach included ride-and-drive events, direct employee engagement (such as lunch-and-learn presentations) and email education. These advocates played an important role in publicizing the program to their fellow employees; the companies with the most engaged internal advocates saw the most sales. Nissan North America had encouraged competition among the companies by offering a free charging station to the employer with the most sales through the program. In addition to this employer-based outreach, DENC reached out to the nearly 2,000 people who had participated in EV ride-and-drive events at DENC events in the last couple years.

The program was very successful; despite preparing for the program with additional LEAF inventory, the local Nissan dealership (Tynan’s) actually ran out of 2015 LEAFs in only seven days. After this, the program shifted to offering a discount on the 2016 LEAF. While the price for a 2016 was somewhat higher at $14,500, the group buy still represented a 44% discount. This shift caused some concern because some people who had expected to be able to get a 2015 LEAF for $10,600 were not as interested in paying $14,500 for a 2016 LEAF. However, there was still a strong increase in sales after the change in pricing, potentially due to the increased functionality of the 2016 LEAF, such as the increased range.
The program opened up to Workplace Charging partners on November 23 and was opened the general public on November 27 (Black Friday). The program concluded on December 31.

During the 39 days of the program, 52 LEAFs were sold by Tynan’s Nissan and at least seven others were sold by other dealerships in the area. This is nearly four times the number of sales that Tynan’s had in 2014, when they sold a total of only 15 LEAFs during the months of November and December.

Figure 4 shows that LEAF sales in Larimer County increased significantly during the group purchase program compared to 2013 and 2014.

The success of the program encouraged the BMW Center in Loveland to offer a $6,000 discount off of the BMW i3, reducing its price from $44,444 to $24,944 after accounting for the federal and state tax credits. The BMW deal was offered from December 15 to January 4.

Based on this success, DENC is hoping to launch another group purchase program in 2016 with an expanded number of dealerships participating.

**University of Utah Group Purchase Program**

The *U Drive Electric* group purchase program was launched on December 14 by the University of Utah Office of Sustainability in partnership with Utah Clean Energy, with funding from the Utah Clean Air Partnership. This program is open to all members of the University of Utah community, including faculty, staff, students, alumni and campus guests who are residents of Salt Lake, Davis, Summit, Tooele, Utah and Weber Counties. *U Drive Electric* negotiated discounts with three different dealerships offering nine different EV models.
Initial vehicle sales were strong and, due to high demand, the program was extended one month, from the end of 2015 to January 31, 2016. At the conclusion of the program, 75 new EVs were sold in only six weeks in the six participating counties (averaging 12.5 sales per week). In comparison, 121 EVs were sold in the entire state of Utah during the last three months of 2014 (averaging 9.3 sales per week statewide).

Table 7 | EV Pricing and Discounts as Part of U Drive Electric Program

<table>
<thead>
<tr>
<th>Price</th>
<th>BMW</th>
<th>Nissan</th>
<th>Ford</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSRP</td>
<td>$43,395</td>
<td>$47,245</td>
<td>$32,130</td>
</tr>
<tr>
<td>Final Price</td>
<td>$29,185</td>
<td>$15,719</td>
<td>$20,748</td>
</tr>
</tbody>
</table>

San Francisco program

At nearly the same time as the Solar Benefits Colorado program was launched, a similar program was started in San Francisco that went from August to October. However, this program met with significantly less success, selling only 15 vehicles over the life of the program.

One possible challenge is that the Bay Area is a very mature EV market compared to Colorado. This region has seen EV sales near 6% of all new car sales over in recent years. This is significantly higher than the percentage in Boulder and Denver, potentially indicating a more saturated market for new EV owners in the Bay Area than in Colorado.

Another challenge came from the dealerships. Four Nissan dealerships under the same ownership participated in the program. However, the decision to participate in the program was made at the ownership level, so there was less buy-in from the individual dealerships. During this time period, there was significant staff turnover at the dealerships, leaving less experienced salespeople to sell the LEAFs. With these two factors in place, potential customers were more likely to come into a dealership and talk with someone who was not familiar with the group purchase program, leading to a non-sale.

Finally, the participating dealerships did not have a large inventory of LEAFs, so there was little incentive to aggressively sell the vehicles.

One key lesson learned from this program is that the dealerships need to have the right salespeople who are very informed and very engaged around selling EVs.
VII. LESSONS LEARNED

Lessons Learned From Program Administrators

Staff from Adams, Boulder and Denver Counties reported that the program did not require a large investment of staff time and that the impact of the program was well worth the staff time dedicated to it. One reason that the program was so efficient, according to staff, was that Vote Solar provided templates for most of the outreach materials that the local governments used, including press releases, newsletters, social media postings, emails and flyers. This made it relatively easy for the local government staff to plug in the relevant information and send out the materials without having to reinvent the wheel.

One local government staffer thought it would be important to have multiple vendors participating in any future rounds so as to give potential EV or PV buyers more choices.

Another staff member mentioned that it was very helpful to have the flexibility to extend the dates of the program to meet customer demand.

Clearer language about exactly what the deal is and what incentives are being offered would be helpful. According to one staff member, it was not always easy for potential program participants to understand the offer.

Everyone was very enthusiastic about participating in an additional group purchase program in the future.

Denver staff said that it was very helpful to have Vote Solar managing the program because they were able to move much faster than local governments in the vendor selection process.

Staff from Boulder County identified an important ancillary benefit of the program: all the publicity and consumer response prompted interest from elected officials and local government staff. The Boulder County Commissioners became more interested in investing additional resources into EVs and approved additional matching funds for the installation of charging stations at workplaces and multi-family housing. The City of Boulder also agreed to contribute matching funds. In addition, Nissan North America donated chargers to Boulder County. Due to this support, several local employers and two multifamily housing sites in Boulder County applied for and received funding to install EV charging stations, including:

- BMC Properties
- Boulder County
- Boulder Valley School District
- City of Boulder
- City of Lafayette
- Douglas Myers
- Gold Run Condominium Association
- Left Hand Brewing Company
- NMMS Twin Peaks, LLC
- The Nature Conservancy
- The W.W. Reynolds Companies
- Town of Lyons
- Wild Sage Cohousing HOA
One big challenge with the program was communicating important data between project partners. For future programs, it would be very helpful to develop an agreed upon data collection template, so that all partners are collecting the same data and it can be easily shared among partners.

Boulder County expressed interest in managing the program themselves in any future rounds. However, the county would need to allocate staff time to set up a web based portal for signing up participants.

**Lessons Learned From Auto Dealerships**

In order to better understand the dealership experience and what could be learned for application to other group purchase programs, we interviewed Nigel Zeid at Boulder Nissan and Tom Lotz at Tynan’s Nissan in Fort Collins.

"It was easier and faster to sell LEAFs through the group purchase program. Customers came in the door ready to buy." ~Tom Lotz, Tynan’s Nissan

Both dealerships were happily surprised by the strong interest they received in the program, and neither had enough inventory on hand to satisfy the demand. Boulder Nissan was able to get LEAFs from other dealerships. Tynans’ felt that they would have been able make more sales if they’d had more LEAFs in stock.

One major benefit of the program to dealers was that selling a LEAF to a group purchase program participant tended to be easier and take less time. The potential customers from the program came into the dealership ready to buy – not to shop, browse or compare prices.

While it is critical that there be one very engaged point person on the sales staff, it is also important that all of the sales staff is familiar with the program and able to help any customers who call or walk in the door. If there is only one person dealing with all EV sales, there will likely be too many people calling or coming in (especially during the initial surge of interest) for one staff person to handle. This could lead to lost sales due to customers interacting with uninformed salespeople or needing to wait too long for a response from the dedicated salesperson.

"Everyone at Boulder Nissan was great and the whole experience has been wonderful!" ~Chris, Boulder County

The program provided a great educational opportunity for Boulder Nissan’s entire sales staff. Once the other salespeople saw how many customers were interested in LEAFs, they were motivated to learn more about them. For this dealership, it was important that salespeople be completely comfortable with the LEAF before they engaged with customers.
The dealerships reported that it can be difficult to track whether people are officially part of the group purchase program. While many people signed up through a website to participate in the program, others simply heard about the program and either called or showed up at the dealerships, making it challenging to determine whether they should be counted as part of the program. This resulted in different sets of data collected, with the program administrator having one set of data from people who signed up on a website and the dealership having a separate or overlapping set of data of customers who walked in the door but had not officially signed up for the program. One recommendation for future programs is that a common data sharing platform be developed to ensure that the same information is collected for walk-ins as for customers who entered through the web portal.

Lessons Learned from Participant Surveys

Surveys were sent out via email to all 578 individuals who signed up for the EV portion of the Boulder County group purchase program. Of the 248 people who did buy a LEAF through the program, we received 124 responses. Of the 330 people who initiated the process but did not buy a LEAF, we received 59 responses. This was a very high response rate for an online survey and we were pleased with the robust data the survey provided. As an incentive, we entered everyone who completed the survey into a drawing for $100 discount on a home charging station or an electric bicycle. The following section provides a summary of survey results that could be useful for future group purchase programs and highlights key data on EVs in general. Complete survey results for both groups are included in Appendix A.

Participants heard about the program through a broad range of sources. For those who purchased EVs, news stories (41% of respondents) were the most common way of learning about the program, followed by word of mouth (32% of respondents) and employers (17% of respondents). For those who ended up not purchasing an EV through the program 36% cited news stories, 24% heard from their employers, 12% heard via word of mouth and 10% heard about it on social media.

When asked how the program could be improved, by far the most common suggestion was to have more and better outreach and advertising. A number of respondents mentioned that although they had heard about it, they felt like very few other people knew about the program.
Figure 5 | SBCO Participants Who Purchased a LEAF: How did you hear about the EV discount purchase program? (124 Responses)

- Advertisement: 17%
- From Employer: 32%
- Word of Mouth: 41%
- News Story: 6%
- Social Media: 5%
- Other: 13%

Figure 6 | Participants Who Did Not Purchase a LEAF: How did you hear about the EV discount purchase program? (59 Responses)

- News Story: 36%
- From Employer: 24%
- Social Media: 12%
- Word of Mouth: 17%
- Advertisement: 10%
- Other: 2%
Additional Highlights from Participant Surveys

Why participants did not buy a LEAF

Of the 330 participants who did not purchase a vehicle through the program, 54 provided feedback about why they did not follow through. Very few respondents cited a problem in the program itself that kept them from purchasing an EV.

Figure 7 | Reasons for Not Purchasing an EV Through the Program

Commute Distances

The average one way commute distance for those who purchased an EV was 14.1 miles and the median commute distance was 11 miles. The average commute distance for those who did not purchase was 14.8 and the median commute distance was 9.5. From this data, it does not seem that longer commute distances played a role in discouraging purchase of an EV. In comparison to the Denver metro region where the average one-way commute is 9.2 miles, EV purchasers have a slightly longer commute but still easily within the range of the LEAF.

Motivations for purchase

When asked about why they purchased an EV, by far the strongest reason was environmental benefits, with 70% citing this as the most important reason. The second reason cited was savings on fuel and maintenance costs. The northern Colorado program also asked this question and got a similar result – the environmental benefits of owning an EV were by far the most important reason cited for the purchase, followed by cost savings and the availability of incentives.
**How to improve the program**

79 respondents who had purchased an EV provided information on how they felt the program could be improved. By far the most common feedback was to have better outreach and advertising so that more people would be aware of the program. After that, the most common suggestions included:

- offering a large incentive;
- extending the program;
- providing more general information about EV and charging stations, including a home charging station component in the program;
- better responsiveness from Boulder Nissan;
- offering clearer information on pricing and incentives; and
- having more vehicles and dealerships involved.

For those participants who did not purchase an EV, the most common recommendation was to offer more EV models from a greater number of dealerships. Other feedback that came from multiple participants included better or clearer financial information and more and better advertising and outreach.

![Figure 8 | Feedback from Buyers on How to Improve the Program](image-url)
Another important finding of the survey was that the majority of participants were not considering buying an EV prior to hearing about the program. Only 28% of survey respondents said they were already considering buying an EV before the SBCO program. This indicates that the SBCO program successfully engaged people who had not yet considered buying an EV. The survey also shows that the program was successful in getting people to buy new cars – even those customers who were not already in the market to do so. 42% of respondents indicated that they were not thinking of buying a new car prior to the program, meaning that these are not just sales that were accelerated forward in time and would have happened eventually. Among the survey respondents who did not buy an EV, 91% indicated that they would like to buy an EV in the future.
Participants generally felt that environmental organizations and air quality agencies were the most trustworthy sources of information on EVs and their benefits. This may indicate that these types of organizations could be good partners for conducting outreach for other EV group purchase programs. Interestingly, the survey data indicates that of the organizations mentioned, electric utilities were the least trusted source of information on EVs. This contradicts other research which indicated that local utilities were one of the most trusted sources of information on EVs.\footnote{Edison Electric Institute. Transportation Electrification. Utilities Leading the Charge. Figure 14: Trust in EV Information Sources} It is possible that conflict over the effort by the City of Boulder to municipalize their electric utility service has led to more negative impressions of investor-owned utilities in the Boulder area than would be typical.

Figure 11 | SBCO Participants Purchasing EVs: Please rate each of the following from 1-5, as to how much trust you have in each of these as sources of information on EVs and their benefits.
Figure 12 | SBCO Participants Who Did Not Purchase: Please rate each of the following as to how much trust you have in each of these as sources of information on EVs and their benefits.

Demographics of program participants

It is important to understand participant demographics in order to 1) most effectively target outreach and marketing, and 2) consider program modifications that may make the program more appealing to other segments of the population.

In the Boulder program, 95% of participants lived in two-car households. This makes sense, given some of the challenges associated with EVs. Since most pure EVs have ranges of around 100 miles, and there is still limited availability of fast charging infrastructure, they are less likely to be chosen as the only vehicle in a household that occasionally makes longer trips. This may not be the case in a program that is also offering plug-in hybrid vehicles such as the Chevy Volt, since these have the ability to travel for hundreds of miles.

Boulder County also found that 94% of participants lived in single family homes. Most charging is done at home, and it is much easier to access charging stations in a driveway or garage of a single family home than it is to install charging in parking areas in multifamily housing. If a program is interested in targeting residents of multifamily housing, it may be necessary to couple this with a program focused on installing charging stations that serve these residents.

“I love the program. Hope you’ll offer it again.” ~ Janna, Jefferson County
APPENDIX A: COMPLETE SURVEY RESULTS FOR THE BOULDER COUNTY / DENVER / ADAMS COUNTY PROGRAM

SBCO Participants Who Purchased a Nissan LEAF

Question 1: How did you hear about the EV discount purchase program? (124 Responses)

- Advertisement: 4.5%
- From Employer: 17.1%
- Word of Mouth: 31.5%
- News Story: 40.5%
- Social Media: 6.3%
- Other: 12.6%

Question 2: Were you considering purchasing a new car or an EV prior to hearing about this program? (124 Responses)

- Already considering an EV: 30%
- Already considering a new car: 42%
- Was not thinking of buying a new car: 28%
Question 3: How easy was the program from sign up to purchase/lease? (122 Responses)

![Bar chart showing response distribution for ease of program sign up to purchase/lease.]

Question 4: Please rank the reasons why you purchased an electric vehicle from most important to least important.

![Bar chart showing response distribution for reasons of electric vehicle purchase.]

- Environmental Benefits
- Reduced Fuel & Maintenance Costs
- New & Exciting Technology
- Superior Performance
- Reduced Oil Consumption

Number of Respondents: 89

Number of Respondents: 18

Number of Respondents: 5

Number of Respondents: 6

Number of Respondents: 4
Question 5: Please rank which of the following types of EV charging are most important to you.

![Bar chart showing the importance of different types of EV charging.]

- Ability to charge at your home: 6.6%
- Charging at your workplace: 84.4%
- Fast charging along major highways: 9.0%
- Charging at major recreational destinations (ski areas, parks, trailheads): 6.6%

Question 6: If you purchased a solar PV system in conjunction with this program, did you size the system to power your car in addition to your home?

(122 Responses)

![Pie chart showing the responses to Question 6.]

- No, the system was only sized to power my home: 84.4%
- No PV System Purchased: 9.0%
- Yes, the system was sized to power my home and car: 6.6%
Question 7: Do you have charging available at your workplace?
(121 Responses)

- Yes: 25%
- No: 75%

Question 8: Please rate your experience at the auto dealer.
(123 Responses)

- Excellent: 86
- Good: 25
- OK: 2
- Bad: 5
- Poor: 5
Question 9: Please rate each of the following from 1-5, as to how much trust you have in each of these as sources of information on EVs and their benefits.

Question 10: In your opinion, how could this program be improved?
Question 11: What is your annual household income?
(122 Responses)

- $25,001-$50,000: 2%
- $50,001-$75,000: 8%
- $75,001-$100,000: 25%
- $100,001-$150,000: 39%
- $150,000+: 25%

Question 12: Does your household own another vehicle?
(123 Responses)

- Yes: 95%
- No: 5%
Question 13: Do you live in single or multi-family housing?  
(124 Responses)

- 94% Single family home (or duplex)
- 6% Multi-family housing

Question 14: How many miles is your daily commute (one way)?  
(117 Responses)

- 0-5 miles: 31%
- 6-10 miles: 18%
- 11-15 miles: 15%
- 16-20 miles: 15%
- 21-30 miles: 15%
- 31-40 miles: 5%
- 41+ miles: 3%
SBCO Participants Who Did Not Purchase a Nissan LEAF

Question 1: How did you hear about the EV discount purchase program? (59 Responses)

- News Story: 36%
- From Employer: 17%
- Social Media: 12%
- Word of Mouth: 10%
- Advertisement: 2%
- Other: 1%

Question 2: Why did you decide to not purchase/lease an electric vehicle through the program?

- Not enough range: 16
- Bought another EV: 11
- Still cost too much: 8
- Unable to get federal tax credit: 4
- Not ready to buy a car: 4
- Cars (in general) cost too much: 4
- Did not get called back: 2
Question 3: Which of the following incentives would be most influential in your decision to purchase/lease an EV (rank in order of importance from most important to least important)?

![Bar chart showing incentives ranked from most to least important.]

- $5,000 state tax credit
- HOV lane access
- Free charging at work
- Free parking downtown
- Lower electricity price
- $5,000 state rebate

Question 4: Please rank which of the following types of EV charging would be most important in your decision to purchase/lease an EV from most important to least important.

![Bar chart showing charging types ranked from most to least important.]

- Charging at your residence (if in multi-family housing)
- Charging at your workplace
- Fast charging along major highway
- Charging stations at major recreational destinations

Number of Respondents
Question 5: Are you considering purchasing/leasing an EV in the future? (57 Responses)

- Yes: 91%
- No: 9%

Question 6: If you interacted with the car dealer, please rate your experience at the dealer. (43 Responses)

- Excellent: 51%
- Good: 26%
- OK: 16%
- Bad: 5%
- Poor: 2%
Question 7: Please rate each of the following as to how much trust you have in each of these as sources of information on EVs and their benefits.

Question 8: Which of the following do you think are the largest barriers to EV adoption?
Question 9: In your opinion, how could this program be improved?

- More dealerships: 8 responses (14%)
- More models: 5 responses (12%)
- Better financial info: 4 responses (21%)
- Better advertising/outreach: 4 responses (26%)
- # of Respondents Giving Answer: 57

Question 10: What is your annual household income?
(57 Responses)

- $10,000-$25,000: 2 responses (4%)
- $25,001-$50,000: 14 responses (24%)
- $50,001-$75,000: 12 responses (21%)
- $75,001-$100,000: 21 responses (37%)
- $100,001-$150,000: 26 responses (46%)
- $150,000+: 25 responses (44%)

# of Respondents Giving Answer: 57
Question 11: Does your household own more than one vehicle?  
(57 Responses)

- Yes: 75%
- No: 25%

Question 12: Do you live in single or multi-family housing?  
(58 Responses)

- Single family home (or duplex): 93%
- Multi-family housing: 7%
Question 13: How many miles is your average daily commute (one way)?
(59 Responses)