



# DES

## DEPARTMENT OF ENVIRONMENT AND SUSTAINABILITY



air quality



desert conservation  
PROGRAM



sustainability

### **Ozone Advance Program Progress Report Update**

**October 2020**

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## **List of Acronyms and Abbreviations**

### **Acronyms**

AQS	Air Quality System
CMAQ	Congestion Mitigation and Air Quality
DES	Clark County Department of Environment and Sustainability
EPA	U.S. Environmental Protection Agency
GOE	Governor's Office of Energy
NAAQS	National Ambient Air Quality Standard
NDOT	Nevada Department of Transportation
NEI	National Emissions Inventory
NRS	Nevada Revised Statute
PPA	power purchase agreement
PV	photovoltaic
RPS	Renewable Portfolio Standard
RTC	Regional Transportation Commission of Southern Nevada
SEZ	Solar Energy Zone
WESTAR	Western States Air Resources Council
WRAP	Western Regional Air Partnership

### **Abbreviations**

CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
kW	kilowatt
kWh	kilowatt-hour
MW	megawatt
MWh	megawatt-hour
NO <sub>x</sub>	nitrogen oxides
ppb	parts per billion
ppm	parts per million
VOC	volatile organic compound

## **1. Introduction**

The Clark County Department of Environment and Sustainability (DES) enrolled in the U.S. Environmental Protection Agency (EPA) Ozone Advance program on June 12, 2013. The program's goals are to ensure that maintenance and attainment areas offer continued health protection, to better position those areas to remain in attainment, and to efficiently direct available resources toward actions to address ozone and its precursors. As Clark County enters its eighth year of participation in the program, DES continues to investigate innovative ways to reduce precursors to ozone formation and new ways to reach out to and educate the public.

DES had contracted with National Oceanic and Atmospheric Administration to conduct a study to better understand the relationship between nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOCs) in southern Nevada. Unfortunately, the study was cancelled due to COVID 19. DES is considering a number of efforts that may help lower ozone levels in the next several years. These include, but are not limited to, ways to convert additional local agency fleets to electric power; ways to convert diesel and gasoline equipment to electric equipment or replace it with newer, more efficient models; additional public outreach, which will include promoting public awareness through social media; and the importance of reducing vehicle idling. In addition, DES is reaching out to other agencies and entities to enhance our coordination and partnerships and explore additional ozone-reducing activities.

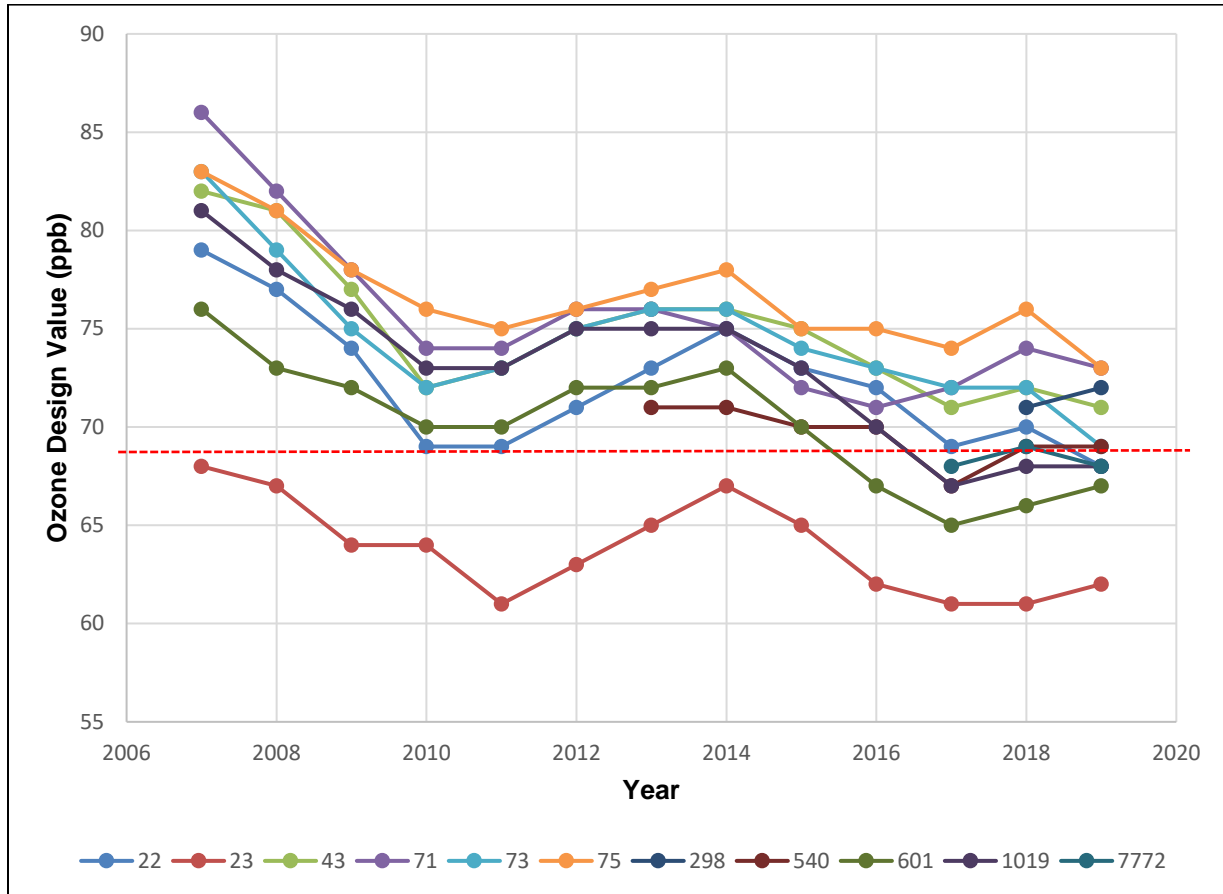
### **A. Current Attainment Status**

On June 4, 2018, EPA designated portions of Clark County (Hydrographic Area 212) as being in nonattainment of the 2015 8-hour ozone National Ambient Air Quality Standard (NAAQS) of 70 parts per billion (ppb), effective August 3, 2018. By law, the state of Nevada uses hydrographic areas to define regions that are in attainment, unclassifiable, and in nonattainment. Table 1-1 shows a list of Clark County's ozone monitoring stations.

**Table 1-1. Ozone Monitoring Stations**

<b>EPA Site ID</b>	<b>Monitor Location</b>
32-003-0022	Apex
32-003-0023	Mesquite
32-003-0043	Paul Meyer
32-003-0071	Walter Johnson
32-003-0073	Palo Verde
32-003-0075	Joe Neal
32-003-0298	Green Valley
32-003-0540	Jerome Mack
32-003-0601	Boulder City
32-003-1019	Jean
32-003-7772	Indian Springs

Design values are used to compare ambient air monitoring data against the NAAQS. Ozone design values are calculated by taking the average of the 4<sup>th</sup> highest 8-hour concentration over three years for each monitor. Clark County's ozone design value history (Figure 1-1) shows an overall downward trend from 2007 through 2019. However, there was an increasing trend between 2011 and 2014. Also, all monitors showed an increase in 2018. As of 2019, four monitors in Clark County (all within Hydrographic Area 212) have ozone design values above the NAAQS.



**Data Source:** EPA's Air Quality System (AQS) AMP480 Design Value Report, ID 1853902, July 1, 2020.

**Note:** 2015 NAAQS (70 ppb) depicted as a dashed red line.

**Figure 1-1. Ozone Design Values (2007–2019).**



## 2. Emission Sources

Ground-level ozone is not usually emitted directly into the air, but is formed through chemical reactions between NO<sub>x</sub> and VOCs in the presence of sunlight. Vehicle exhaust, emissions from commercial and industrial sources, gasoline vapors, chemical solvents, and natural sources emit NO<sub>x</sub> and VOCs. Ozone source categories include:

- Point: Smokestack sources, such as industry and utilities.
- Non-point: VOC sources, including gas stations, dry cleaners, print shops, and consumer products, and NO<sub>x</sub> sources, including forest fires, residential fires, and natural gas-fired water heaters.
- On-road: Vehicles traveling on paved roads, e.g., cars, trucks, buses, and motorcycles.
- Non-road: Vehicles not traveling on paved roads, e.g., construction and agricultural vehicles, lawn care equipment, motorboats, and locomotives.
- Biogenic: Trees and other natural sources.

DES submits emission inventory data to EPA for point, non-point (area), on-road, and non-road sources. Most of this emission information is based on local data, figures submitted by permitted facilities, or estimates made using population data. EPA includes these emission inventories in the triennial National Emissions Inventory (NEI), which contains data not only for criteria pollutants but also for hazardous air pollutants (some of which are VOCs). EPA released the 2017 NEI in June 2020.

The following sections focus on NO<sub>x</sub> and VOCs, considered the primary precursors for ozone. Tables 2-1 and 2-2 provide NO<sub>x</sub> and VOC data for the source categories: point/non-point, on-road, non-road, and biogenic. Figures 2-1 and 2-2 illustrate the data in these tables.

**Table 2-1. NO<sub>x</sub> Emissions for 2017 (tons)**

Source Category	2017 Emissions
Point/Non-point	7,485
On-road	14,290
Non-road	14,538
Biogenic	768
<b>TOTAL</b>	<b>37,081</b>

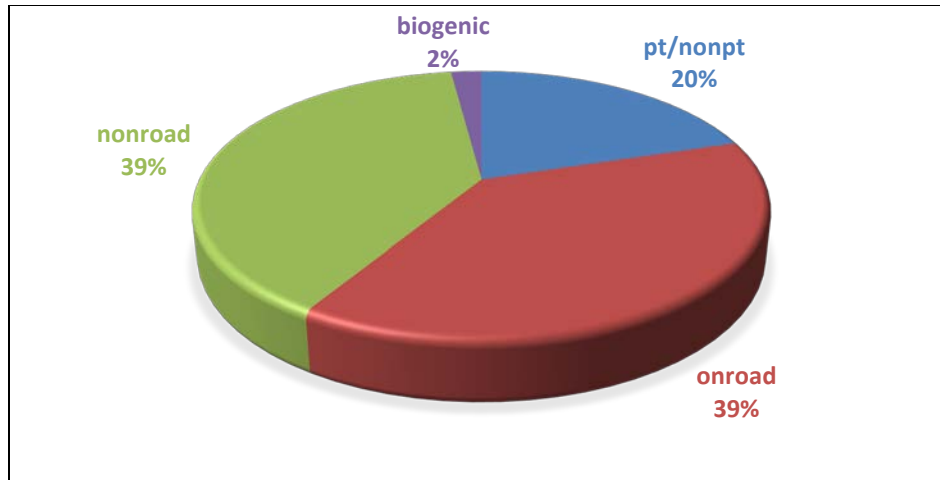


Figure 2-1. NO<sub>x</sub> Source Apportionment.

Table 2-2. VOC Emissions for 2017 (tons)

Source Category	2017 Emissions
Point/Non-point	23,982
Onroad	8,490
Nonroad	7,839
Biogenic	54,727
<b>TOTAL</b>	<b>95,038</b>

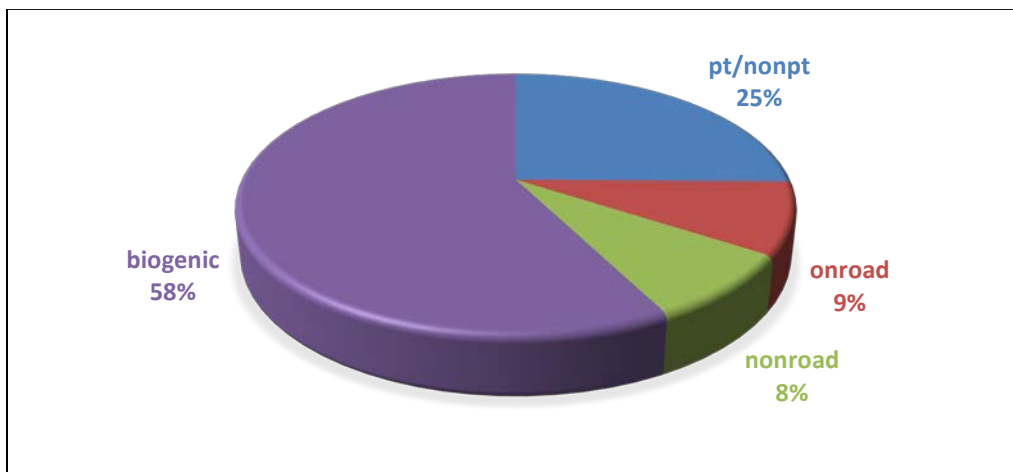


Figure 2-2. VOC Source Apportionment.

#### A. Emissions and Source Categories

Tables 2-3 and 2-4 list 2017 Tier 1 NO<sub>x</sub> and VOC emission data, respectively. Vehicles (on-road and non-road) make up the two highest categories of NO<sub>x</sub> emissions and account for 78% of the

2017 total in Clark County. Biogenic makes up the highest category of VOC emissions, accounting for 58% of the 2017 total. Solvent use is the second-highest category of VOCs, followed by on-road vehicles.

**Table 2-3. NO<sub>x</sub> Emissions in 2017 (tons)**

TIER 1 NAME	NO <sub>x</sub>	% of Total
Off-highway	14,538	39
Highway vehicles	14,290	39
Fuel comb. – other	3,279	9
Fuel comb. – industrial	1,624	4
Other industrial processes	1,527	4
Fuel comb. – Elec Util	886	2
Natural Resources	768	2
Waste disposal & recycling	109	<1
Petroleum & related industries	22	<1
Miscellaneous	16	<1
Metals processing	13	<1
Storage & transport	8	<1
Solvent utilization	2	<1
<b>TOTAL</b>	<b>37,081</b>	

**Table 2-4. VOC Emissions in 2017 (tons)**

TIER 1 NAME	VOC	% of Total
Natural Resources	54,727	58
Solvent utilization	17,667	19
Highway vehicles	8,490	9
Off-highway	7,839	8
Storage & transport	4,018	4
Fuel comb. – other	881	1
Waste disposal & recycling	529	1
Fuel comb. – elec. util.	261	<1
Miscellaneous	255	<1
Other industrial processes	249	<1
Fuel comb. – industrial	97	<1
Petroleum & related industries	25	<1
Metals processing	2	<1
<b>TOTAL</b>	<b>95,038</b>	

### 3. Stakeholders

DES continues to engage with stakeholder groups and provide a forum to review and comment on state implementation plans, Exceptional Event Rule demonstration packages, county rulemakings, and other documents and actions. Stakeholder groups include members of the regulated community, environmental groups, other Clark County communities, state agencies, and EPA.

The **Southern Nevada Fleet Association** is a nonprofit group whose goal is to improve vehicle efficiency and reduce operating costs by advancing clean technologies, networking between agencies, and providing opportunities for education and training.

The **Metropolitan Planning Subcommittee** assists the Executive Advisory Committee in preparing recommendations to the Regional Transportation Commission of Southern Nevada (RTC). The subcommittee considers transportation planning and programming issues that require investigation and analysis.

The **Southern Nevada Regional Planning Coalition** was created in 1999 by Senate Bill 436, and was further refined in January 2000 by interlocal agreements between Clark County, the City of Las Vegas, the City of Henderson, the City of North Las Vegas, the City of Boulder City, and the Clark County School District Board of Trustees under the authority of Nevada Revised Statute (NRS) 277.180. The coalition prepares a biennial report on air quality policies and implementation plans adopted by DES, including ozone implementation plans and policies. The Coalition completed the “Southern Nevada Strong” regional plan, which includes policies that provide for alternative modes of transportation.

The Nevada **Advisory Committee on Control of Emissions from Motor Vehicles** was established in June of 1990 by the Nevada state legislature. The committee was charged to:

- Establish program goals and objectives for control of motor vehicle emissions.
- Identify areas where funding should be made available.
- Review and make recommendations concerning adopted regulations.

Committee members are appointed by the deputy director of the Nevada Department of Motor Vehicles and meet at least quarterly. See Nevada Administrative Code 445B.853–857 for details.

The **Western States Air Resources Council (WESTAR)** was founded in 1988 by eight state air agencies, and has since grown to fifteen states plus several local and tribal air quality agencies. The council’s purposes are to:

- Promote the exchange of information related to the control of air pollution for use in state and federal activities, as authorized by air quality statutes and regulations.
- Develop processes and procedures for consideration by Western states, federal land managers, and EPA to meet air quality objectives and protect environmental resources.
- Discuss air quality issues of common concern.

- Report on the status of efforts undertaken to achieve air quality objectives.
- Establish work groups, task forces, etc., to investigate specific topics and recommend a course of action for council members.
- Adopt resolutions and policy statements for council member implementation or use during the development of local, state, and federal programs, regulations, and laws.

WESTAR changed its bylaws in 2013, allowing DES to join as an ex-officio member. The department is a very active participant now that ozone transport has become a regional issue. During meetings and conferences, WESTAR discusses possible control measures and other ways to reduce NO<sub>x</sub> and VOC emissions. The council has been an excellent platform to exchange information with agencies outside of Clark County and to evaluate their control programs.

**The Western Regional Air Partnership (WRAP)**, formed in 1997, is a membership organization supporting Western regional air quality analyses and the planning needs of its members. WRAP is a voluntary partnership of states, tribes, federal land managers, local air agencies, and EPA whose purpose is to understand current and evolving regional air quality issues in the West. WESTAR and WRAP have joined together in a partnership.

The issues WRAP addresses include, but are not limited to:

- Implementation of, and future planning for, the Regional Haze Rule.
- Air quality issues related to ozone, particulate matter, nitrogen deposition and critical loads, mercury, and other pollutants.
- Emission sources from all sectors, both domestic and international.
- The effects of air pollution transport.
- The effects of climate change on regional air quality.

To address these issues, WRAP develops, maintains, and shares databases; supports technical analyses; and provides access to data and information from various sources to produce consistent, comparable, and complete results for use by individual members and agencies.

**The Southern Nevada Home Builders Association** has received several prestigious awards for its work on local environmental issues, including protection of multispecies habitat, air quality, dust control, and water and energy conservation. DES is a member of its community planning and infrastructure committee, which meets regularly to discuss issues of land use, environment, air and water quality, and other categories important to home builders in Clark County.

The **DES Air Quality Planning Division and Monitoring Division Committee** is comprised of DES personnel who meet monthly to discuss air quality data-related concerns, key projects related to meeting and maintaining the NAAQS, and other issues related to EPA regulatory requirements. The committee examines issues with local and transported ozone, particulate matter, and other criteria pollutants, and recently supervised a study of summer ozone patterns in Clark County. It reviews DES's Monitoring Network Plans, monitor site locations, Exceptional Event Rule demonstration packages, data analyses, special sampling needs (e.g., for fireworks and wildfires), and other reports and projects that require oversight.

**The Nevada Air Quality Agencies Consortium** includes representatives from EPA Region 9, the Nevada Division of Environmental Protection, DES, and Washoe County's Air Quality Management Division. These agencies meet biennially to discuss environmental issues in Nevada and the requirements of upcoming regulatory documents and reports.

**Nevada air agencies**, including the Nevada Division of Environmental Protection (NDEP), DES, and Washoe County's Air Quality Management Division, have a monthly teleconference to discuss air quality issues pertaining to the state of Nevada. Issues the teleconference covers include, but are not limited to, ozone transport, the Ozone Advance Program, implementation plans, and exceptional events. Table 3-1 lists stakeholder organizations and their meeting frequency.

**Table 3-1. Stakeholder Organizations and Frequency of Meetings**

Name of Organization	Frequency of Meetings/Teleconferences
Southern Nevada Fleet Association	Every other month
Metropolitan Planning Subcommittee	Every other month
Southern Nevada Regional Planning Coalition	Monthly
Southern Nevada Home Builders Association	Monthly
Advisory Committee on Control of Emissions from Motor Vehicles	Quarterly
Western States Air Resources Council	Semiannually
Western Regional Air Partnership	Semiannually
DAQ Air Quality Planning Division and Monitoring Division Committee	Monthly
Nevada Air Quality Agencies Consortium	Biennial
Nevada Air Agencies	Monthly

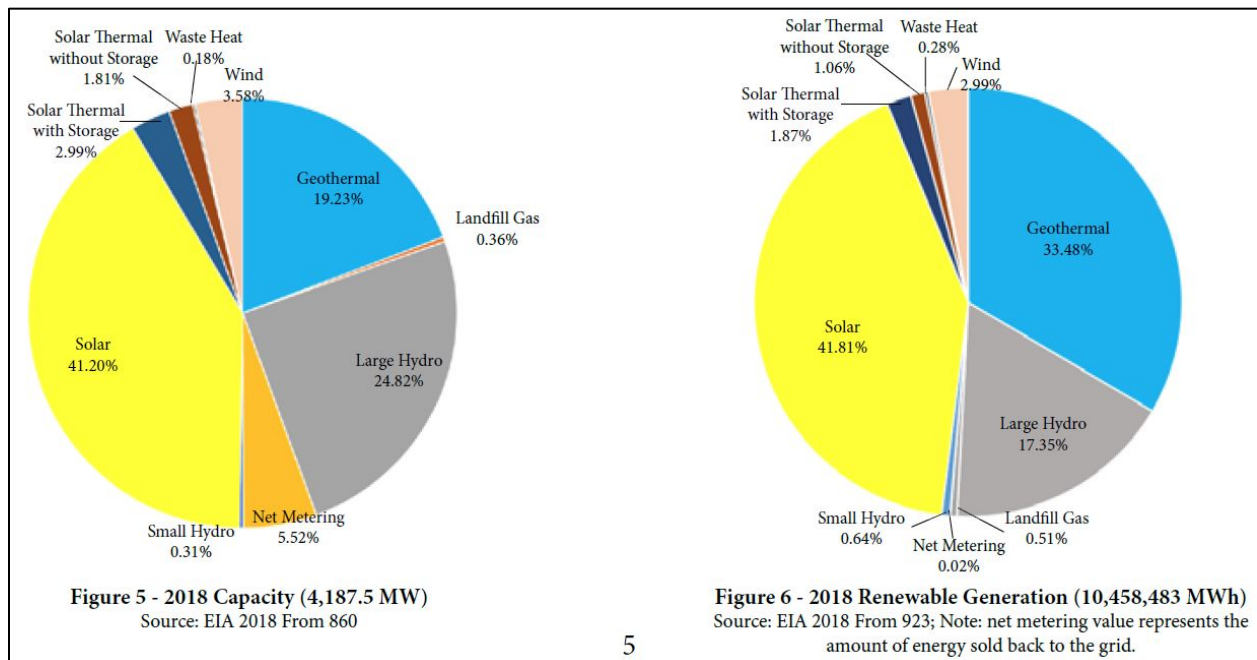
## 4. Energy Programs

In 2018, renewable energy resources generated 26% of Nevada's in-state utility-scale electricity (<http://www.eia.gov/state/print.cfm?sid=nv>). Solar electricity generation supplied 12% of the state's utility-scale power, geothermal energy provided 9% and 5% came from hydroelectric power. This was due in part to Nevada's Renewable Portfolio Standard (RPS) (NRS 704.7801), which requires electric utilities in the state to generate, acquire, or save a certain percentage of electricity annually through renewable energy systems or energy efficiency measures. The law was amended in 2019 (Senate Bill 358) to require a 50% contribution from renewable energy by 2030.

The RPS, along with federal grants, has been the driver for many renewable energy projects in Nevada. This section summarizes the status of major renewable energy projects currently operating, under construction, or in development.

### A. Solar

Figure 4-1 shows renewable energy capacity installed and the energy generated, respectively, in 2018. "Nameplate capacity" is the maximum rated electric output a generator can produce under specific conditions. "Generation" is the amount of electricity a generator actually produces over a specific time. In the year 2018, 10,458,483 megawatt-hours (MWh) were generated from an installed capacity of 4,187 megawatts (MW) of renewable energy (<http://energy.nv.gov/uploaded-Files/energynv.gov/content/Media/2019%20Status%20of%20Energy.pdf>).



Data Source: 2019 State of Nevada Status of Energy Report (Governor's Office of Energy).

**Figure 4-1. Nevada Renewable Capacity and Generation.**

Nevada ranked sixth nationally in the category of total installed solar capacity (3,587 MW). There is enough solar generation in the state to power 665,836 homes ([https://www.seia.org/sites/default/files/2020-06/Nevada\\_0.pdf](https://www.seia.org/sites/default/files/2020-06/Nevada_0.pdf)).

Table 4-1 lists solar generating projects now operating in Clark County; Table 4-2 lists solar projects that are in development.

**Table 4-1. Clark County Solar Projects in Operation**

Owner	Plant Name	Nameplate Capacity	Power Purchase Agreement	Completed
Acciona Solar Power	Nevada Solar One	75 MW	NV Energy	June 2007
TerraForm Power	Nellis I Solar Star	14 MW	Nellis AFB	December 2007
Sempra Energy	Copper Mountain 1	58 MW	PG&E	December 2010
Southern Power Company	Apex Nevada Solar	20 MW	NV Energy	2012
Enbridge	Silver State North Solar Energy Center	52 MW	NV Energy	May 2012
Sempra Energy	Copper Mountain 2	154 MW	PG&E	July 2012
Southern Power Company	Spectrum Nevada Solar	30 MW	NV Energy	2013
NextEra Energy	Mountain View Solar	20 MW	NV Energy	January 2014
Sempra Energy	Copper Mountain 3	255 MW	Southern California Public Power Authority	May 2014
American Capital/ Searchlight Solar LLC	Searchlight Solar I	17.5 MW	NV Energy	January 2015
TerraForm Power	River Mountain Solar	14 MW	Southern Nevada Water Authority	January 2016
SunPower	Nellis AFB Solar Array II	15 MW	Nellis AFB	February 2016
NextEra Energy	Silver State South Solar Energy Center	250 MW	SoCal Edison	December 2016
Sempra Energy	Copper Mountain 4	94 MW	SoCal Edison	December 2016
SunPower	Boulder Solar I	100 MW	NV Energy	December 2016
SunPower	Boulder Solar II	50 MW	NV Energy	February 2017
First Solar	Moapa Southern Paiute Solar Project	250 MW	LA Dept. Water & Power	March 2017
EDF Renewables	Switch Solar 1	79 MW	NV Energy	December 2017
EDF Renewables	Switch Solar 2	100 MW	NV Energy	December 2017
174 Power Global	Techren Solar I	100 MW	NV Energy	December 2018
Swinerton Renewable	Techren Solar II	200 MW	NV Energy	August 2019



**Table 4-2. Clark County Solar Projects in Development**

Owner	Plant Name	Nameplate Capacity	Power Purchase Agreement	Status
Techren Solar LLC	Techren Solar 3,4, and 5	100 MW	NV Energy	Under construction
Invenergy-MGM	Harry Allen Solar Energy Project	100 MW	MGM Resorts	Completion scheduled for 2020
Sempra Renewables	Copper Mountain Solar 5	250 MW	NV Energy	Completion scheduled for 2021
8minute Solar Energy	Eagle Shadow Mountain Solar Farm	300 MW	NV Energy	Completion scheduled for 2021
8minute Solar Energy	Southern Bighorn Solar Center	300 MW	NV Energy	Construction to start in 2022
Nextera Energy	Yellow Pine Solar	250 MW	Unknown	EIS Process
Arevia Power	Gemini Solar	690 MW	NV Energy	EIS Process

## **B. Nevada Governor’s Office of Energy**

The Nevada Governor’s Office of Energy (GOE) oversees state energy programs under NRS 701 and 701A, advises the governor on energy policy, and administers grant/rebate programs using state and federal funds. GOE administers the Green Building Tax Abatement Program as an incentive for business owners to improve the energy efficiency of new and existing buildings. To qualify for the partial tax abatement, applicants must earn a minimum number of points for energy conservation: this is determined either by an Energy Star score at the Silver Level or higher in the Leadership in Energy and Environmental Design (LEED) rating system, or by two globes or higher in the Green Globes rating system. In 2019, 16 buildings in Nevada, representing more than 11 million square feet of space, received a Green Globes or LEED certification. There are currently 186 buildings participating in the program (<http://energy.nv.gov/uploadedFiles/energynv.gov/content/Media/2019%20Status%20of%20Energy.pdf>).

## **C. City of Las Vegas**

The City of Las Vegas receives 100 percent of its power from renewable energy sources after entering into a Renewable Energy Agreement with NV Energy. The city now runs more than 140 facilities—everything from City Hall to parks to streetlights—on clean energy (<https://cityoflasvegas.tumblr.com/post/154385263383/mayor-announces-city-power-comes-from-100>). City of Las Vegas also powers on-site facilities with solar panels in the City Hall plaza, solar shade canopies at city parks, and solar arrays on city-owned building roofs and at the wastewater treatment plant.

The city launched a new program – Commercial Property Assessed Clean Energy (C-PACE) in 2019, designed to provide long-term investments in clean energy for commercial property owners. New construction and existing building retrofit projects can apply for C-PACE financing based on the proposed energy saving improvements.

#### **D. STAR Communities**

The STAR Community Rating System (STAR) is a certification program for evaluating local sustainability, encompassing economic, environmental and social performance measures (<http://www.starcommunities.org/about/framework/>). The rating system uses several air quality related evaluation measures such as energy efficiency, greenhouse gas mitigation, local government greenhouse gas footprint, greening the energy supply and climate adaptation.

In Clark County, both City of Henderson and City of Las Vegas are 4-STAR certified communities. The City of Henderson achieved a 4-STAR rating in 2016 with a score of 60.5/100 in the Climate and Energy measure. The City of Las Vegas was rated a 4-STAR community in 2015 with a score of 77.8/100 for Climate and Energy.

#### **E. NV Energy**

Now fully subscribed, NV Energy paid approximately \$146 million in incentives for the installation of rooftop solar in residential and commercial properties. Since the inception of the program in 2004, nearly 270,000 kW of solar capacity has been installed (<https://www.nvenergy.com/cleanenergy/monthly-report>). NV Energy still offers incentives under the Lower Income Solar Energy Program (LISEP) to business customers for solar photovoltaic systems that serve lower income populations. It also offers incentives for installation of residential and commercial solar-integrated energy storage systems.

#### **F. SolSmart**

SolSmart is a national designation program recognizing cities, counties, and regional organizations that foster the development of mature local solar markets. Clark County earned a bronze and the City of Las Vegas earned a gold level designation in the U.S. Department of Energy funded program. Both entities created an online permitting checklist increasing transparency for solar installers and community members. They reviewed local zoning codes and identified restrictions that intentionally or unintentionally prohibit solar development. The City of Las Vegas earned a special award for inspection. The City earned a gold level designation for allowing solar by-right accessory use in all zones, cross training both inspection and permitting staff on solar and providing a streamlined permitting pathway for small photovoltaic systems (<https://solsmart.org/communities/las-vegas/>).

## 5. Mobile Sources

### A. Volkswagen Settlement

In 2017, Volkswagen (VW) settled with the U.S. government and California after it was discovered that the company violated the Clean Air Act by making cars designed to cheat on smog tests. Thousands of VW cars in Nevada emitted NO<sub>x</sub> over the legal limit; Nevada received \$24.8 million through the VW settlement to help fund projects to offset the excess pollution emitted.

NDEP has developed a Beneficiary Mitigation Plan with input from the Nevada Advisory Committee on the Control of Emissions from Motor Vehicles. Approximately \$17 million of the VW settlement is allocated for projects under the Diesel Emission Mitigation Fund (DEMF). Figure 5-1 shows a list of projects in Clark County awarded under DEMF's first and second annual competitive funding cycles. Projects were estimated to result in a NO<sub>x</sub> mitigation of approximately 670 tons in the first cycle and 44 tons in the second cycle.

**1<sup>st</sup> Annual Competitive Funding Cycle**

Awardee	Award Amount	Project
Clark County		
Allegiant Air	\$157,200.00	Replacement from diesel to electric of two pieces of airport ground support equipment.
Clark County Department of Aviation	\$90,000.00	Diesel repower of five airport shuttle bus engines.
Clark County School District	\$150,000.00	Diesel replacement of five school buses.
Republic Services	\$200,000.00	Replacement from diesel to natural gas of five refuse trucks.
Southern Nevada RTC	\$300,000.00	Replacement from diesel to natural gas of five transit buses.
Southwest Airlines	\$3,655,661.29	Replacement from diesel and gasoline to electric of 109 pieces of airport ground support equipment.
United Airlines	\$658,043.40	Replacement from diesel to electric of twenty-one pieces of airport ground support equipment.

**2<sup>nd</sup> Annual Competitive Funding Cycle**

Awardee	Award Amount	Project
Clark County		
Allegiant Air	\$127,308.00	Electric replacement of four pieces of gasoline-powered airport ground support equipment
JetBlue Airways	\$176,617.20	Electric replacement of five pieces of gasoline-powered airport ground support equipment
Republic Services	\$920,000.00	CNG replacement of 23 diesel-powered refuse trucks
Southwest Airlines	\$1,072,702.22	Electric replacement of eight diesel-powered aircraft pushback tugs

Data Source: <https://ndep.nv.gov/air/vw-settlement/demf-awards>

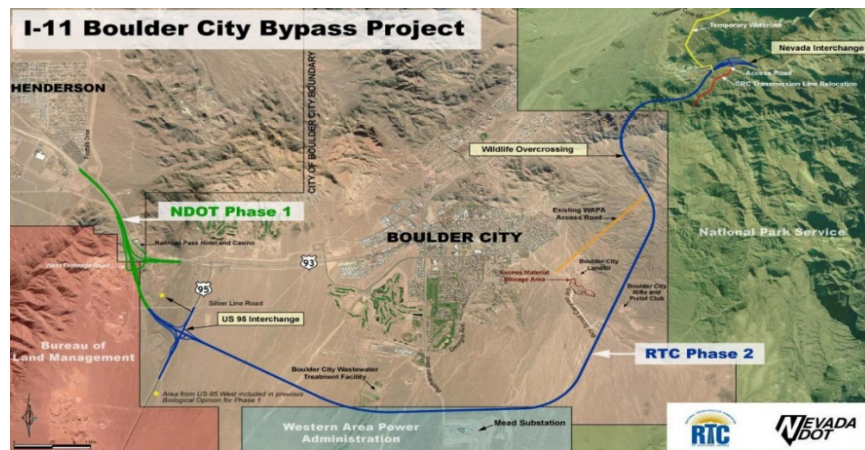
**Figure 5-1. DEMF Funded Projects in Clark County.**

## B. Project NEON

Construction of Project Neon started in 2016 and was completed in August 2019. The project consisted of widening 3.7 miles of Interstate 15 between Sahara Avenue and the U.S. 95/I-15 interchange near downtown Las Vegas. This stretch of I-15 is the busiest in Nevada, carrying more than 300,000 vehicles daily—a number projected to double by 2035 (<http://ndotproject-neon.com/learn/overview/>). Project NEON is expected to reduce accidents and other travel delays, bringing down idling times and NO<sub>x</sub> emissions. The project includes High-Occupancy Vehicle lanes between U.S. 95 and I-15 (20 miles), along with better connections to surface streets into and out of the downtown area. Active Traffic Management freeway signs were also installed for traffic flow control, real time speed limit sign changing and other dynamic messaging.

## C. Boulder City Bypass / Interstate 11

The Boulder City bypass involves road improvements to U.S. Highway 93, a major commercial corridor and the only route through Boulder City. Construction began in May 2015; the Nevada Department of Transportation constructed the 2.5-mile Phase 1 portion of I-11 from Railroad Pass to U.S. 95 (Figure 5-2), while the RTC managed the 12.5-mile Phase 2 route from U.S. 95 to U.S. 93, near the Hoover Dam bypass bridge. Construction was completed in August 2018 (<http://i-11nv.com/>).



Data Source: <https://www.nevadadot.com/projects-programs/road-projects/interstate-11>

**Figure 5-2. I-11 Boulder City Bypass Project.**

U.S. 93 carries more than 34,000 vehicles per day on the main street of Boulder City. The Boulder City bypass allows traffic to flow through the area without the stoplights and congestion associated with the current route.

## D. Clark County Fleet

The county has 2,471 vehicles, 397 of which are hybrids. The fleet contains 13 Chevy Volt, 6 Tesla and 130 SmartWay vehicles—cars and trucks that EPA has certified for improved fuel efficiency and reduced environmental impact.

### **E. RTC Club Ride**

In April 2015, EPA honored RTC's Club Ride program with a Clean Air Excellence Award, which "recognizes and honors outstanding innovative efforts to help make progress in achieving cleaner air." Club Ride is a free program designed to improve air quality by encouraging commute alternatives, e.g., carpooling, vanpooling, walking, bicycling, public transport, compressed work weeks, and telecommuting. Over 400 employers participate in Club Ride with approximately 18,700 active commuters. The program removed nearly 8.5 million vehicle travel miles from the road, resulting in the reduction of 85 tons of carbon monoxide (CO), 19 tons of NO<sub>x</sub>, and 14 tons of VOCs in 2019.

### **F. RTC Bike Share**

RTC Bike Share was launched in 2016 to enhance the transportation options in downtown Las Vegas. The program, with 21 stations and 180 bikes, complements the dedicated green bike lanes. Since inception, 206,316 miles were travelled in 67,909 trips. RTC estimates Bike Share has taken approximately 98 tons of CO<sub>2</sub> out of the air (<https://bikeshare.rtcnv.com/about/data/>). The program has also reduced an estimated 900 pounds of NO<sub>x</sub>.

### **G. Low or No Emission Grant**

RTC has received a \$3.8 million grant from U.S. Department of Transportation Low or No Emission Grant Program. The funds will allow RTC to deploy two hydrogen fuel cell buses and install hydrogen-fueling infrastructure. RTC estimates delivery of the buses in 2022 at a total project cost of \$6 million (<https://www.rtcnv.com/news/rtc-awarded-3-8-million-federal-grant-to-continue-to-invest-in-clean-energy-vehicles/>).

### **H. Congestion Mitigation and Air Quality Improvement (CMAQ) Program**

DES has secured funding to purchase hybrid electric vehicles under the CMAQ program administered by the Federal Highway Administration. Three Chevy Volts (plug-in hybrid electric vehicles), six Tesla Model 3 (electric vehicles) and 26 Chevy Malibu hybrids (hybrid electric vehicles) have been procured under Phase I (fiscal year 2017 [FY17] to FY21) of the project. Nine more hybrid electric vehicles are anticipated to be purchased using the remaining funds under Phase I. The project has been delayed due to tightening of the Buy America Waiver approval process under the federal directive. RTC has approved DES's request to move the funds approved for this project to FY2022. In Phase II of the project, 16 electric vehicles and 60 hybrids will be purchased from FY22 to FY24. Tables 5-1 and 5-2 show total vehicle emission reductions and total emissions reduction compared with a midsize gasoline car for Phase I. Similar data for Phase II are shown in Tables 5-3 and 5-4.

**Table 5-1. Phase I Emission Reductions**

Vehicle Type	Chevy Volt		Tesla Model 3		Chevy Malibu Hybrid	
Pollutant	Emission Reductions (kg/day/vehicle)	Total Emission Reductions over Vehicle Life (kg/all vehicles)	Emission Reductions (kg/day/vehicle)	Total Emission Reductions over Vehicle Life (kg/all vehicles)	Emission Reductions (kg/day/vehicle)	Total Emission Reductions over Vehicle Life (kg/all vehicles)
VOCs	0.005	68	0.010	226	0.003	436
CO	0.071	889	0.073	1,636	0.040	5,807
NO <sub>x</sub>	0.005	58	0.004	100	0.003	401

**Table 5-2. Phase I Emission Reduction Comparison**

Pollutant	Chevy Volt Reduction	Tesla Model 3	Chevy Malibu Hybrid Reduction
VOCs	80%	100%	43%
NO <sub>x</sub>	73%	94%	43%
<b>Average:</b>	<b>77%</b>	<b>97%</b>	<b>43%</b>

**Table 5-3. Phase II Emission Reductions**

Vehicle Type	Electric		Hybrid	
Pollutant	Emission Reductions (kg/day/vehicle)	Total Emission Reductions over Vehicle Life (kg/all vehicles)	Emission Reductions (kg/day/vehicle)	Total Emission Reductions over Vehicle Life (kg/all vehicles)
VOCs	0.010	602	0.002	563
CO	0.073	4,362	0.032	7,117
NO <sub>x</sub>	0.004	265	0.002	462

**Table 5-4. Phase II Emission Reduction Comparison**

Pollutant	Electric Reduction	Hybrid Reduction
VOCs	100%	43%
NO <sub>x</sub>	94%	43%
<b>Average:</b>	<b>97%</b>	<b>43%</b>



## **I. Anti-Idling Regulations**

Section 45 of the Clark County Air Quality Regulations, “Idling of Diesel Powered Motor Vehicles,” prohibits idling of diesel-powered trucks or bus vehicles for more than 15 consecutive minutes. The only exemptions are for emergency vehicles; vehicles used to repair or maintain other vehicles; vehicles stopped because of traffic congestion on a highway or street; vehicles whose engines must idle to perform a specific task, such as trenching or hoisting; and any vehicle idling while maintenance procedures are being performed at a repair facility.

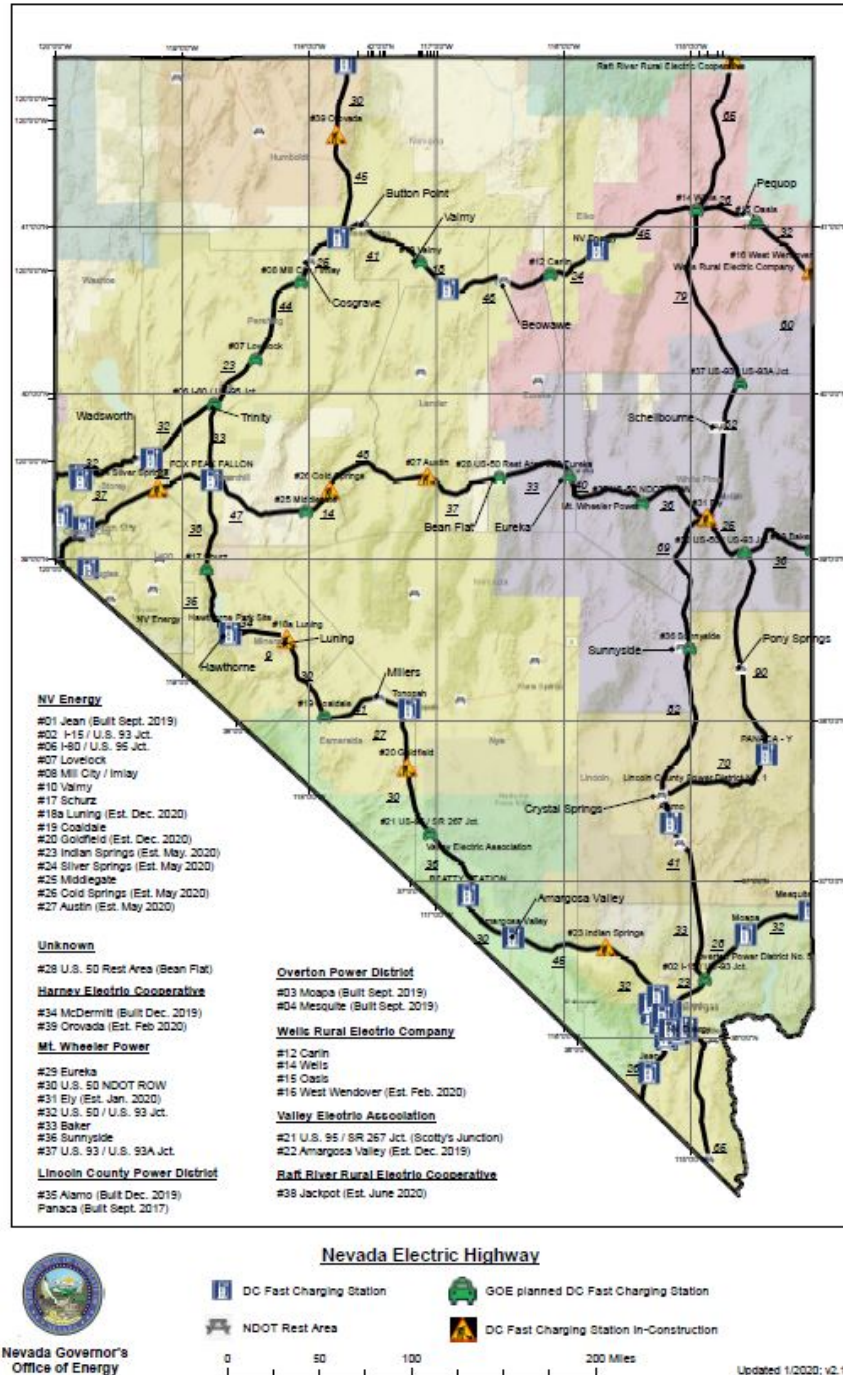
## **J. Voluntary Airport Low Emissions Program**

The VALE program was established in 2004 to encourage airports to implement clean technology projects that improve air quality. VALE is available to commercial airports located in nonattainment or maintenance areas; projects generate Airport Emission Reduction Credits that are recognized by EPA to meet future air emission regulation requirements (<https://www.faa.gov/airports/environmental/vale/media/VALE-brochure-2017.pdf>). According to the Federal Aviation Administration (FAA), McCarran International Airport, North Las Vegas Airport, and Henderson Executive Airport are eligible for the VALE program. In June 2019, the Clark County Department of Aviation (DOA) submitted a VALE grant application to the FAA for McCarran International Airport. McCarran Airport was awarded an Airport Improvement Program grant (\$4,274,843) by the FAA to install 59 dual port charging stations (<https://www.faa.gov/airports/environmental/vale/media/VALE-grant-summary.pdf>). The chargers will be used for airport ground support equipment being electrified using VW settlement funds.

## **K. Nevada Electric Highway**

The Nevada Electric Highway began as a joint venture between the GOE, NV Energy, and the Valley Electric Association to expand Nevada’s infrastructure for charging electric vehicles. Using federal and state grants, the three partner with businesses along U.S. 95 to provide charging stations on the road between Reno and Las Vegas in the first phase of the project. Charging stations are operational in Tonopah, Beatty, Hawthorne, and Fallon (Figure 5-3), and a station is under construction in Indian Springs. Each location has two Level 2 chargers and one Direct Current Fast Charger. Business owners will provide free charging services for the first five years.

Phase II of the Nevada Electric Highway officially began in 2017 with the completion of a charging station in Panaca. At the completion of Phase II, charging stations will be deployed on the state’s remaining major interstate and highway corridors, including I-15, I-80, U.S. Highway 93, and U.S. Highway 50 ([http://energy.nv.gov/Programs/Nevada\\_Electric\\_Highway/](http://energy.nv.gov/Programs/Nevada_Electric_Highway/)). NDEP expects that 15% of the VW settlement fund will go to support the development of the Nevada Electric Highway (<https://ndep.nv.gov/air/vw-settlement/bmp>). Jean, Moapa, and Mesquite stations were constructed in Clark County with VW settlement funds and were opened in 2019.



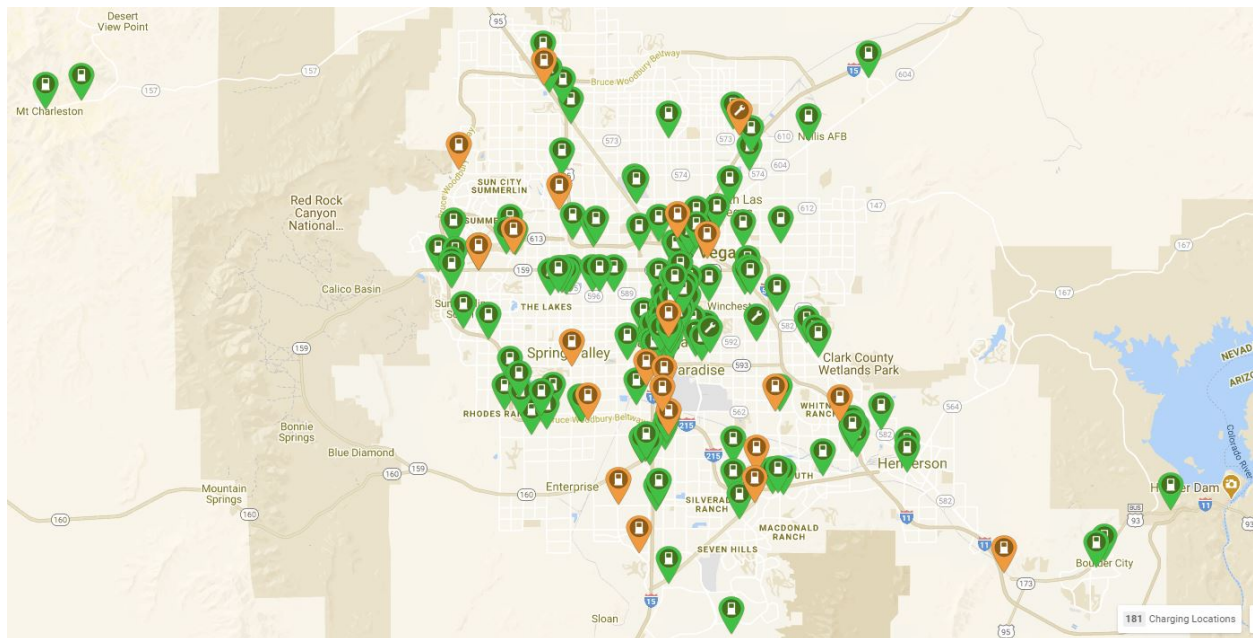
Data Source: <http://energy.nv.gov/uploadedFiles/energygov/content/Programs/NEH%20Map%20v2.11.pdf>

Figure 5-3. Nevada Electric Highway.

## L. Electric Vehicle Charging Stations

Clark County has more than 190 electric vehicle charging locations (<https://www.plugshare.com/>), the majority of which are free to the public (Figure 5-4).





Data Source: <https://www.plugshare.com/>

**Figure 5-4. Electrical Vehicle Charging Stations in the Las Vegas Area.**

NV Energy has allocated \$15 million for incentives to build electric charging stations. Businesses, non-profits, schools and public enterprises can apply for these incentives to build charging stations at workplaces, multifamily properties and public places. Since inception, NV Energy has provided \$439,712 (as of May 2020) in incentives to construct charging stations at 22 locations (19-workplace, 2-multifamily and 1-public) (<https://www.nvenergy.com/cleanenergy/monthly-report>).

### **M. Southern Nevada Strong**

The Southern Nevada Strong Regional Plan was created to better integrate quality housing, transportation, education, workforce, and social service networks. Implementation began in 2015 under the administration of RTC. The plan identifies 300 specific strategies to make southern Nevada a more viable place to live, work, and play (<http://sns.rtcnv.com/implementation-matrix/>).

As part of the Southern Nevada Strong, RTC launched On Board as a comprehensive mobility plan for Southern Nevada. The following transportation and mobility strategies identified in the plan will help improve local air quality ([https://assets.onboardsnv.com/wp-content/uploads/2020/06/11152131/Las-Vegas-Draft-Briefing-Book\\_11-22-19\\_Facing-Pages.pdf](https://assets.onboardsnv.com/wp-content/uploads/2020/06/11152131/Las-Vegas-Draft-Briefing-Book_11-22-19_Facing-Pages.pdf)):

- Build high capacity transit system
- Expand transit service to maximize access to jobs and housing
- Make short trips easier
- Improve connections to major destinations
- Leverage new technology to improve mobility



## **6. Outreach**

The goal of DES's public information and education program is to create citizen awareness and interest in air quality, transform behaviors and habits, and encourage voluntary actions to reduce air pollution. Every year, Clark County issues a season-long ozone advisory that tells the public about ozone's health effects and suggests ways to reduce ozone pollution. DES also provides daily air quality reports and forecasts on its website, along with real-time monitoring data, and engages with outside organizations that focus on public outreach and communication.

### **A. 2019 Outreach Activities**

DES participated in 38 events in 2019, which yielded 11,444 engagements. Each engagement represents one person DES outreach volunteers spoke to, answered questions from, and shared vital air quality information with. Event audiences included the general public, senior citizens, K-12 children, college students, and the business community.

In addition to continuing participation in back-to-school events (families), senior expos (senior citizens) and First Friday (arts-centric community), DES participated in the Clark County School District's "Science Week." DES staff presented educational, interactive seminars for students of all ages. The week culminated in the Las Vegas Science and Technology Fair, where the DES booth engaged more than 1,700 attendees.

To kick off Air Quality Awareness Week, Clark County presented DES with a proclamation to commemorate the event. Following the proclamation, DES maintained an information booth at the County's Government Center. DES also assembled information booths at local gas stations, promoting ozone awareness and tips to reduce ozone.

Below is a list of 2019 outreach activities:

- January 24, 2019: Preview Las Vegas, Thomas and Mack Center
- February 13, 2019: Young at Heart Senior Expo, Suncoast Casino
- February 20, 2019: Young at Heart Senior Expo, Santa Fe Station Casino
- February 27, 2019: Young at Heart Senior Expo, Sunset Station Casino
- March 1 and April 5, 2019: First Friday, Downtown Las Vegas
- April 20, 2019: GREENFEST, Downtown Summerlin
- April 27, 2019: Cystic Fibrosis Foundation Walk, Henderson
- April 30–May 3, 2019: Awareness Week classroom visits, CCSD Schools
- April 30 and May 2, 2019: Operation Ozone, 7-Eleven
- May 3 and June 7, 2019: First Friday, Downtown Las Vegas
- May 4, 2019: Las Vegas Science & Technology Festival, World Market Center
- June 28 and July 26, 2019: Last Friday, City of Henderson

- July 27, 2019: Back to School, Boulevard Mall
- August 1, 2019: Better Breathers Club Presentation, Dignity Health, Henderson
- August 3, 2019: Back to School, Meadows Mall
- August 9, 2019: Environmental Health Expo, SHND
- August 10, 2019: Back to School, Downtown Summerlin
- August 30, 2019: Last Friday, Henderson
- September 7, 2019: Asthma Fair, Sunset Park
- September 28, 2019: Grapes and Hops, Springs Preserve
- October 9, 2019: Senior Expo, Suncoast Casino
- October 9, 2019: Senior Expo, Santa Fe Station Casino
- October 25, 2019: Last Friday, Henderson
- October 30, 2019: Senior Expo, Sunset Station Casino
- November 30, 2019: Tamales & Mariachi Festival, City of Las Vegas
- December 14, 2019: Henderson Winterfest Parade, Downtown Henderson

## **B. 2020 Outreach Activities**

DES sponsored Scale the Strat, a stair-climbing event hosted by the American Lung Association's Nevada chapter. It was the first of what is intended to be several partnership opportunities with the American Lung Association. By mid-March, DES had participated in seven outreach events, yielding 1,513 engagements. DES had planned for several new events in 2020, including Market in the Alley, a farmer's market-style event in downtown Las Vegas. Unfortunately, COVID-19 and eventual shutdown forced DES to suspend all in-person outreach opportunities for the remainder of 2020.

As Clark County strives to reopen, DES has decided to forgo in-person outreach. Instead, DES has turned to virtual outreach opportunities, participating in a virtual classroom seminar about air quality with Clark County School District elementary students. Also, DES participated in a "Coffee Talk" Zoom meeting with the Green Team's Nevada chapter to discuss air quality issues. Moving forward, DES will continue to examine online outreach opportunities.

Below is a list of 2020 outreach activities:

- January 11, 2020: Healthy Henderson, Henderson Multigenerational Recreation Center
- January 25, 2020: Divas Day Out, Galleria Mall
- February 1, 2020: NSSTA 2020 Southern Conference, Rancho High School
- February 10, 2020: Senior Expo, Suncoast Casino
- February 23, 2020: Scale the Strat, The Strat Casino

- March 6 , 2020: First Friday, Downtown Las Vegas
- March 10, 2020: Senior Expo, Aliante Casino
- May 7, 2020: Classroom Presentation (Virtual), Robert Taylor Middle School
- July 29, 2020: Coffee Talk (Virtual), Green Team, Nevada Chapter

The goal of outreach is to communicate the department’s purpose to the community through public, private, and business events in a professional, informative, and friendly manner. DES believes educating the public is essential to allowing people to make informed decisions about their health and welfare.

### **C. Future Outreach Effort**

With in-person events uncertain in the near future, DES will continue to explore online channels for opportunities to engage with the public. Social media activity is ramping up to help fill the void left by the lack of outreach events. Also, DES is producing educational videos on topics such as ozone to inform the public. Videos will be disseminated via social media.

DES continues the Ozone Action Days program, a voluntary initiative that asks county residents to take additional preventive actions when high ozone levels are predicted. Clark County meteorologists can forecast when ground-level ozone may exceed health standards; on those days, Clark County disseminates air quality messages to media outlets, government agencies, and other Ozone Action Day<sup>1</sup> participants. The department also makes Ozone Action Day messages and daily forecasts available to the public through its website and social media posts.

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<sup>1</sup> *Clark County Nevada Ozone Redesignation Request and Maintenance Plan*, Section 4.4.2.5.

## 7. Emission Reductions

DES used EPA's **A**Voided **E**missions and gene**R**ation **T**ool (AVERT) to calculate emission reductions in 2019, which were significantly attributable to renewable energy programs. Table 7-1 lists projects completed in 2019, along with their generating capacities. Figure 7-1 shows the corresponding input file for the AVERT model (v2.3\_05-24-2019).

**Table 7-1. Renewable Energy Projects**

Type	Project	MW
Solar	Techren Solar II	200
	<b>Total</b>	<b>200</b>

**Enter EE impacts based on the % reduction of regional fossil load**

Reduce generation by a percent in some or all hours		
Apply reduction to top X% hours:	0%	% of top hours
Reduction % in top X% of hours:	0.0%	% reduction

**And/or enter EE impacts distributed evenly throughout the year**

Reduce generation by annual GWh:	0	GWh
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**OR**

Reduce each hour by constant MW:	0.0	MW
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**And/or enter annual capacity of RE resources**

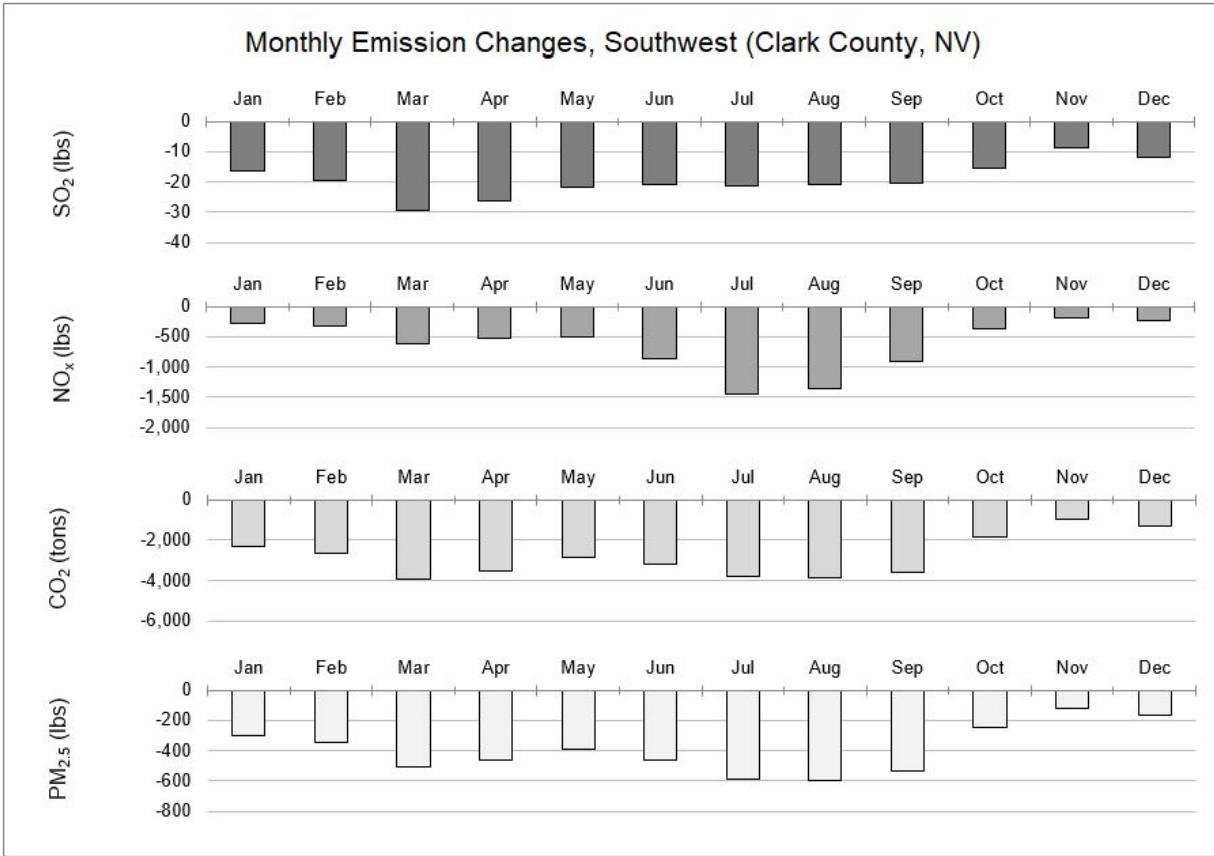
Wind Capacity:	0	MW
Utility Solar PV Capacity:	200	MW
Rooftop Solar PV Capacity:	0	MW

**Figure 7-1. Inputs for AVERT Model.**

According to the model, renewable energy generation annually displaced 74,460 MWh, which equals a reduction of 7,630 pounds of NO<sub>x</sub>. During the ozone season, renewable energy displaced a total of 5,100 pounds of NO<sub>x</sub> in Clark County (Table 7-2). Figure 7-2 shows the monthly emission reductions for specific criteria pollutants.

**Table 7-2. Annual Displacement**

Peak Gross Generation Post-EERE (MW)	Annual Gross Generation Post-EERE (MWh)	Annual Displaced Generation (MWh)	Annual Displaced NO <sub>x</sub> (lb)	Annual Displaced CO <sub>2</sub> (tons)	Ozone Season Displaced NO <sub>x</sub> (lb)	Ozone Season, 10 Peak Days Displaced NO <sub>x</sub> (lb)
3,829	18,491,240	-74,460	-7,630	-33,960	-5,100	-40



Note: Negative numbers indicate displaced generation and emissions.

**Figure 7-2. Monthly Displacements.**

The output from AVERT was input into EPA's Co-Benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA) Version 4.0 to estimate the health and economic impact of the emission reductions. Table 7-3 shows the low and high estimates of total health benefits for Clark County and the entire country for the different baseline years.

**Table 7-3. Health Benefit Estimates**

Analysis Year	Clark County, NV		Nationwide	
	Low Estimate	High Estimate	Low Estimate	High Estimate
2016	\$ 123,786	\$ 279,842	\$ 1,674,113	\$ 3,781,034
2023	\$ 150,977	\$ 340,767	\$ 1,883,737	\$ 4,246,739
2028	\$ 179,557	\$ 405,054	\$ 2,151,590	\$ 4,847,280

## **8. Conclusion**

The goal of DES is to reduce VOC and NO<sub>x</sub> through mandatory and voluntary control measures, including the installation and use of renewable energy and energy efficiency measures. Many organizations in Clark County are making great strides to reduce precursor emissions. Private companies and departments at all levels of government provide county residents with a variety of emission reduction programs. Future federal regulations for mobile sources, in conjunction with scheduled highway improvement projects, will further reduce NO<sub>x</sub> emissions in the county.

The COVID-19 situation has presented challenges in the outreach efforts. DES will explore ways to reach the public through virtual and social media channels. DES will continue to research and evaluate other short and long term initiatives to reduce ozone levels. DES will continue to participate in stakeholder committees to ensure ozone advance goals are addressed. These concerted efforts on federal, state, and local levels should help Clark County meet and maintain the ozone NAAQS.