



ROOS INSTRUMENTS, INC.

Corporate Social Responsibility (CSR)

2022 Annual Report

Roos Instruments produces Automated Test Equipment for the world's most innovative semiconductor technology. RI continues to lead the ATE industry with a Corporate Social Responsibility (CSR) management system focused on reaching aggressive goals that reduce our impact on the environment.

Visit roos.com/green for access to this and previous annual reports.

2022 Energy Facts	
Natural Gas:	2,689 Therms
Electricity:*	168,172 Kilowatt Hours
GHG (Scope 1&2):	19.287 tCO ₂ -e

*100% of electricity offset by Renewable Energy Credits
100% Western Solar



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In 2022, Roos Instruments maintained a 80% fixed reduction target that remains the same every year. We continue to enjoy the reduced environmental footprint from changes made in previous years.

Purchasing 100% green energy since 2005 has helped us reach a higher standard of environmental responsibility and encouraged us to take this concept one step further. We are proud to offer our flagship product, Cassini, as one of the most energy efficient automated test equipment available, helping our customers set higher standards in responsible semiconductor manufacturing.

“We see this initiative as a wise investment in our future. Meeting energy needs with clean power and reducing the energy footprint of any investment, be it our company or the products we make, is very rewarding.” -- Cathy Rossi-Roos, Roos Instruments COO.

Accomplishments

17 Years of 100% Renewable Electricity

100% CA Solar¹

Over 4.3 MWh purchased since 2005 from Silicon Valley Power, Green Power Supporter.

Awarded Environmental Innovator 2010

Awarded 2011

Silicon Valley Power issues the Environmental Innovation Award to organizations for "all around efforts to support energy efficiency and renewable energy."

At Desk Recycling - quarterly recycling, reduce waste, reuse components

Since 2009

Each desk has a dedicated recycling container, facilities empties weekly and reports "good to great" compliance and notifies individuals of incorrectly discarding recyclable material in a waste bin. Our vendor, Waste Management, switched from taking only paper and cardboard (separated) to accepting all forms of plastic, glass, aluminum, and paper in one container, increasing individual compliance.

Green Projects - Ideas to improve energy conservation collected from staff

Since 2012

Reduce Travel - Telecommuting and Virtual/Web Conferencing

Since 2006

Composting – Food and soiled paper waste is collected for composting

Since 2019

LED Lighting – Replaced existing fluorescent lighting fixtures with modern lightening standards for brightness, installed motion sensors and replaced all fixtures with LEDs, to eliminate hazardous waste disposal activity and reduce energy use over the fixtures' lifetime.

Since 2020

¹ Green Power Facilities – Sources for Renewable Energy Credits
<https://www.siliconvalleypower.com/sustainability/santa-clara-green-power/green-power-facilities>

Goals for 2022

Reach 80% Reduction of "Peak" Electricity²

185,868 kWh Target (26% reduction)

168,172 kWh Actual (Target Exceeded by 9.52%)

Maintain Natural Gas at 2008 Levels³

2,179 Therms Target

2,689 Therms Actual (Target Missed by 22%)

Reduce all electricity usage to reach 80% of "peak demand."

Planned Projects

- Maintain Energy reduction programs to meet future goals
- Cascading requirements - Vendor incentives (monetary and preference) to voluntarily participate in creating a CSR of their own.
- Strive for 100% recycling with facility reviews where all recyclable material is recovered from waste bins prior to dumping.
- Increase energy efficiency of RI systems with software and hardware engineering related to supporting sleep and low power modes.

² For 2019, Goal for electrical consumption is 185,686 kWhs/yr or less (80% of Peak Demand, 2008 Annual Usage = 232,335 kWh)

³ 100% or less of 2008 levels or 2,179 Therms/yr

Green Power Partners

Silicon Valley Power



100% renewable energy from Silicon Valley Power. Verifiable RECs available upon request.⁴

United States Environmental Protection Agency (EPA)



Roos Instruments participates with the EPA Green Power partnership. RI has purchased 100% renewable energy since 2005.⁵

These suppliers and customers have implemented a similar Corporate Responsibility and Environmental Management System. Thank you for helping Roos Instruments promote good environmental stewardship in the semiconductor industry.



⁴ Send an email to ["admin@roos.com"](mailto:admin@roos.com) to request RECs from Silicon Valley Power

⁵ EPA: <https://www.epa.gov/greenpower/green-power-partnership-100-green-power-users-0>

Green Projects

RI Santa Clara, CA

Building Area: ~1820 m² (~19,600 feet²) , Constructed 1978

5,000 feet² updated 2007 with modern HVAC, 2022 with motion activated LED lights

The projects listed below contributed to achieving the 2022 targets.

Total Expected Annual Impact for All Projects in 2022: **80 Therms**

Name of Project

Potential Impact⁶

HVAC Efficiency Tuning and Maintenance:

80 Therms

Assure optimum performance, managed by Environmental Systems.

Other CSR Goals:

- Reclaim Used Equipment: Any RI equipment can be returned to Santa Clara factory for recycling. Incentives like free shipping may be available. Publicized online [roos.com/contact](https://www.roos.com/contact), and on printed material like docs & service/training manuals.
- Maintain high recycling compliance with "unified" recycling bins located throughout the building that is used for plastic, aluminum and paper instead of separate bins.
- Supply "Green certified" office cleaner and post-consumer recycled paper products in restrooms and kitchens and environmentally friendly cleaning chemicals.
- Divert waste with composting collection bins.

Vendor Letter and qualification:

- Promote vendors who have their own Green programs on our [roos.com/green](https://www.roos.com/green) page. Prefer "green" vendors by clearly marking them in our vendor contact databases to enable increased purchasing of equipment and services from preferred sources.

⁶ Potential Impacts were computed with the following calculators:
EPA's www.epa.gov/cleanenergy/energy-resources/calculator.html
CO2 Footprint Calculator: www.carbonify.com/carbon-calculator.htm

Future Green Projects

Name of Project

Potential Impact

Clean Living

Waste Reclaim

Replacing all non-biodegradable products used in the break rooms like foam cups and plates to biodegradable ones.

Sweater & Shorts Days:

400 Therms

Wear warm clothing and leave temp down to 68 one day a week in Winter.

Wear cool clothing and leave temp up to 76 one day a week in Summer.

Land Care:

Hazardous Material Reduction

Mulching and using non-toxic chemicals for lawn maintenance.

Purchase RECs to offset 100% GHG Emissions:

100% GHG Offsets

Employee Activities

Recycle Program: 100% of recyclable material is collected in dedicated bins.

Composting: Divert waste that is not recyclable but will compost to dedicated bins.

Green Waste: Recycle all electronics that are not in use.

Annual Employee Training and Audits: Carpool, how to reduce paper, proper tire inflation, etc...

Support mobile workforce:

1,000 kWh

Provide smart phones, laptops and other resources for mobile and remote offices.

Web conference

Saving Estimated 2.91 Tons of CO₂

Instead of face to face meetings, use remote presence (video chat) for sales/support.

Cascading CSR Notice

Reduce Scope 3 GHG

Top 10 vendor CSR Questionnaire - Cascading requirement letter and questionnaire.

Compliance Enforcement

All local and national environmental laws, regulations and contractual requirements are followed by ensuring that appropriate signs and labels are posted. Employees are notified of changes to requirements via email and are required to attend annual safety training programs appropriate to their tasks. All vendors are certified and approved legal operations, only verified if suspected of violations.

Projects are reviewed by assigned personnel and milestones used to show progress.
OSHA - Computer Workstations & Material Safety Data Sheets (MSDS)

Employees are asked to complete the [Green Audit & Survey](#)
RI Headquarters in Santa Clara is included in this program.

Safety Program

All Employees should complete formal training including workstation ergonomics, lifting, emergency plans, and distracted driving. Employees working on the production of RI systems complete electronics safety, soldering iron, lighting, ventilation, and lead exposure training courses. Employees who regularly ship equipment must learn about back safety, maintaining a safe working environment (i.e. no cluttered floors) and proper lighting.

Employee Training Resources

The Roos Instruments' new employee training presentation includes an introduction: "What is our CSR?", an Employee Survey/Audit, and mandatory minimum training. There will be a prize incentive to come up with a project that saves the most kWh or CO₂. Carpooling is highly encouraged. The thermostat is not 72°F all year round; 74°F in warm months and 68°F in cold months, using personal heaters and fans to adjust for individual comfort. Employees sent newsletter including links to "[More Energy Saving Tips](#)" online. Posters from "[Recyclestuff.org](#)" remind employees where to recycle various items. [Local Government Programs](#) are used to educate and engage. Email newsletter includes topics like "[How to Reduce paper at work](#)" and "Dangers of distracted driving" OSHA's distracted driving brochure explains to employers and supervisors the importance of preventing texting by their workers while driving. Texting while driving dramatically increases the risk of motor vehicle crashes, the leading cause of worker fatalities.

Disclosing Results

The Green Annual Report, this document, is published online at roos.com/green and includes Roos Instruments' annual usage, goals, projects, analysis, and refinements needed to the Corporate Social Responsibility program.

Fully Loaded Cassini 16



800 Watts



=

Greenhouse Gas (GHG) Emissions

Greenhouse Gas Emissions and Carbon Dioxide Equivalent (CO₂ -e) are calculated using the GHG Corporate Protocol standard⁷. Zero percent (0%) of Scope 1 and one hundred percent (100%) of Scope 2 GHG Emissions are offset by Renewable Energy Credits.

Total Scope 1 & 2 **18,725 kg CO₂-e**

Scope1: Generated by Roos Instruments

Includes RI vehicles, appliances (refrigerators), HVAC systems, facilities, and landscaping.

2000 Tundra 4WD, 6 cyl, 3.4 L (Petroleum - Transportation) ⁸	4,738 kg CO₂-e
3 Office Refrigerators (Leaking Refrigerant) ⁹	56 kg CO₂-e
12 Air Conditioning Units (Leaking Refrigerant) ¹⁰	100 kg CO₂-e
Facilities (Gas Lawn Care, Blower, etc.) ¹¹	142 kg CO₂-e
Natural Gas (Heating with Natural Gas): 2,689 Therms ¹²	14,251 kg CO₂-e

Scope 1 Total: **19,287 kg CO₂-e**

Scope2: Generated by electricity producers (Silicon Valley Power)

100% renewable sources. Natural Gas usage is included in Scope 1.

Electricity: 213,865 kWh **100% Offset by Renewable Energy Credits**

Scope 2 Total: **0 kg CO₂-e**

Total GHG tCO₂-e By Year (excluding Scope 2, 100% offset by RECs)

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
15.461	15.238	14.220	14.018	13.482	15.009	15.514	13.774	21.623	15.668	18.725	19.287

⁷ Scope1 GHG emissions calculation. <http://www.ghgprotocol.org/calculation-tools/fag>

⁸ Annual mileage is estimated 7,500 miles/year @ 15 mpg = 0.0667 gallons per mile = 500 gallons of gasoline per year

⁹ KitchenAid Model: KSF5200EWHO, 5.125 oz of R134b, 0.145291306 kg
 Kenmore Model: 106.9618412, 1992, 6.25 oz R12 0.17718452 kg!
 Electrolux Home Products: 4.25oz, R134a = 0.1566305 kg
 Total from Refrigerant = 0.479 kg
 Global Warming Potential Table HFC 134a, 1300 R404a, 3260 R407b, 2285 R407c, 1526 R410A, 1725 source:
<http://www.ghgprotocol.org/calculation-tools/all-tools>

¹⁰ GHG emissions from refrigerants (kg CO₂-e) = Recharge capacity (kg) X Annual leakage rate x Global Warming Potential - 37.72 kg CO₂ -e = 0.322 kg x 0.09 x 1300; Air conditioners/chillers Annual leakage rate = 0.09 (9%) - www.fueleconomy.gov

¹¹ According to the EPA, and one gas-powered [lawn mower emits](http://www.epa.gov/cleanenergy/energy-resources/calculator.html) as many pollutants as 8 new vehicles driving 55mph for the same period of time. 30 min per week, for 12 months, equals 16 hours, approx 16 gallons of gas.

¹² 5.3 kg or 0.0053 metric tons CO₂/therm - <https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references>

Energy Usage Details

Electricity generated by Silicon Valley Power

Conservation efforts are monitored with vendor supplied meters.

kWH By Year¹³

2009	2010	2011	2012	2013	2014	2015
218,917	208,384	208,240	205,462	200,039	195,526	208,068
2016	2017	2018	2019	2020	2021	2022
213,741	212,113	213,225	216,584	170,032	213,685	168,172

2022 kWH By Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
13381	12956	12629	12080	13478	15228	17199	18315	19198	14818	14073	13023

Natural Gas provided by PG&E

Conservation efforts are monitored with vendor supplied meters.

Therms By Year¹⁴

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
2,179	1,881	1,982	2,317	1,946	2,584	1,698	1,588	1,720	1,395	1,581	3,410	2,006	2,583	2,689

2022 Therms By Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
730	498	498	336	234	101	16	0	0	11	34	201

¹³ Started purchasing Renewable Energy Credits in 2005. Totals revised after 2022 audit corrected for consumption overcount.

¹⁴ Totals revised after audited data correction.