



ROOS INSTRUMENTS, INC.

Corporate Social Responsibility (CSR)

2020 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 other annual reports.

2020 Energy Facts	
Natural Gas:	3,135 Therms
*Electricity:	157,694 Kilowatt Hours
GHG (Scope 1&2):	18,756 kg CO ₂ -e

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



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In 2020, Roos Instruments has completed a LED lighting upgrade, allowing us to resume the ambitious 2% annual reduction in electrical consumption targets. Instead of an 80% fixed reduction target that remains the same every year, we are now targeting a continued reduction of consumption every year. We enjoyed 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

15 Years of 100% Renewable Electricity

100% CA Solar¹

Over 4 MWh purchased since 2005 from Silicon Valley Power, Green Power Supporter.

Year	2006	2007	2008	2009	2010	2011	2012	2013
KwH	202,634	210,240	230,975	218,975	208,594	209,113	201,336	199,806
% diff	1.24%	3.62%	8.98%	-5.51%	-4.95%	0.25%	-3.72%	-0.01%

Year	2014	2015	2016	2017	2018	2019	2020
KwH	184,782	202,079	203,589	212,113	211,603	216,584	157,694
% diff	-8.13%	8.56%	0.36%	6.13%	-2.24%	2.29%	-27.19%

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

Composing – 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

¹Green Power Facilities – Sources for Renewable Energy Credits

<https://www.siliconvalleypower.com/sustainability/santa-clara-green-power/green-power-facilities>

Goals for 2020

Reach 72% Reduction of "Peak" Electricity²

167,281 kWh Target (26% reduction)

157,694 kWh Actual (Target Beat by 5.73%)

Maintain Natural Gas at 2008 Levels³

2,179 Therms Target

3,135 Therms Actual (Target Missed by 47%)

Encourage corporate environmental responsibility with focused programs to increase awareness and building efficiency and increase individual employee participation with "Green Team" awards and incentives. Reduce all electricity usage by 2% year after year of "peak demand." After successfully targeting 10% reduction in 2011, after 9 more years, the target is now 72% of peak demand, representing a 26% reduction overall.

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.

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

³100% 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



The following 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.

⁴Send an email to "admin@roos.com" to request RECs from Silicon Valley Power

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

Green Projects

RI Santa Clara, CA

Building Area: ~19,600 feet², Constructed 1978

5,000 feet² redeveloped 2007 with modern HVAC, high efficiency motion sensing lights

The projects listed below contributed to achieving the 2020 targets.

Total Expected Annual Impact for All Projects in 2020: **250 kWh**

Name of Project

*Potential Impact*⁶

Continue Power conservation:

250 kWh

Turn off lights when not in use. Use motion sensors for lights frequently left on.

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, 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 page. Prefer "green" vendors by clearly marking them in our vendor contact databases to enable increased purchasing of equipment and services from preferred sources.

⁶Potential 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 two days a week in Winter.

Wear cool clothing and leave temp up to 76 two days 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.

Composing: 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.

"Green Team" awards are given to RI employees annually to encourage innovation and participation.

Innovator - finds new and effective ways to meet or define goals

Grind - the person recognized for doing the most to lower consumption, increase reuse, or do the most recycling @ RI Santa Clara

Guru - the person who proves the most aware of RI's current programs (answers most questions right, random drawing if tie)

Example "Green Team" Guru survey questions:

How many kWhs did Roos Instruments consume last year?

How many Watts does a fully loaded Cassini (16 TIMs) use in an hour?

What is the closest Thermostat set at right now?

How many Therms (Natural Gas) did RI use last year?

How many average total miles do RI employees collectively commute per day?
(excluding visits from employees normally staffed outside of Santa Clara county)

What is RI's CO₂ Equivalent impact? (mostly due to Natural Gas consumption)

Employee Training Resources

The Roos Instruments' 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. Employees sent newsletter including links to "[More Energy Saving Tips](#)" online. Posters from "[Recyclestuff.org](#)" remind employees where to recycle various items. Occasionally "Bike to Work" incentives like free lunch are used to get hooked on cycling as normal transportation. [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) published online at roos.com/green 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 **18,756 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): 2,593 Therms¹² **13,720 kg CO₂-e**

Scope 1 Total: **18,756 kg CO₂-e**

Scope2: Generated by electricity producers (Silicon Valley Power)

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

Electricity: 156,694 kWh **110,789 kg CO₂-e**

100% Offset by Renewable Energy Credits

Scope 2 Total: **0 kg CO₂-e**

Total GHG CO₂-e By Year (excluding Scope 2, 100% offset by RECs)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
16,328	15,461	15,238	14,220	14,018	13,482	15,009	15,514	13,774	21,623	18,756
-	-5.61%	-1.46%	-7.16%	-1.44%	-3.98%	11.32%	3.25%	-11.22%	56.98%	-13.26%

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

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

⁹KitchenAid 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>

¹⁰GHG 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

¹¹According 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.

<http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

¹²0.0053 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

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
230,975	218,917	208,384	208,240	205,462	200,039	195,526	208,068	213,741	212,113	213,225	216,584	157,694
10.63%	-5.90%	-4.68%	-0.07%	-1.33%	-2.64%	-2.26%	6.41%	2.73%	-0.75%	0.51%	1.58%	-27.19%

Percentage is Year to Year Difference

2020 kWH By Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
17,524	13,429	13,506	12,535	12,630	13,397	15,715	14,418	15,470	15,771	14,820	9,472

Natural Gas provided by PG&E

Conservation efforts are monitored with vendor supplied meters.

Therms By Year

2008	2009	2010	2011	2012	2013	2014 ¹⁴	2015	2016	2017	2018	2019	2020
2,179	2,135	2,092	1,966	1,924	1,732	1,694	1,593	1,881	1,574	1,648	3135	2593
N/A	86%	91%	106%	89%	119%	78%	73%	86%	72%	76%	144%	119%

Target is same as 2008 of 2,179 Therms

2019 Therms By Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
495	495	317	334	172	49	14	54	64	72	134	393
-0.52	0.12	0.31	0.13	0.1	-0.79	-0.93	-	-0.8	0.14	-0.25	-0.36

¹³Started purchasing Renewable Energy Credits in 2005. Totals revised after 2017 audited data correction for month-to-month irregularities.

¹⁴2014 amount revised after audited data