

New Jersey's Clean Energy Program

LGEA Exit Meeting for: Linwood City School District

TRC Energy Services

February 14, 2019

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Introductions

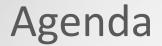


Linwood City School District

- Teri Weeks Business Administrator
- Patrick Childs Director of Facilities

NJ Clean Energy Program

- Brian DeLuca, CEM TRC Program Manager
- Robert Grindrod TRC Auditor
- Elizabeth Ebinger TRC Account Manager
- Gary Finger TRC Outreach Manager
- Mike Thulen ESIP Coordinator





- The audit process overview
- Energy use & existing conditions
- Review of Energy Conservation Measures (ECMs) identified
- Questions or concerns regarding the draft audit report
- Overview of NJCEP equipment incentives
- Next steps for Linwood City School District

LGEA Process



Application Approval Scheduling Call Audit **Benchmarking & Analysis Draft Report Exit Meeting Presentation Final Report**

Site Visit and Utility Analysis



Overview of Systems, Baseline & Existing Conditions:

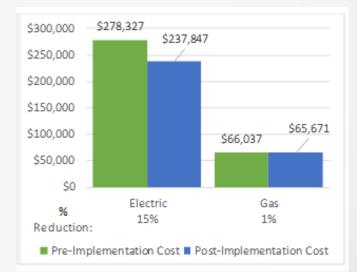
- Building Envelope
- Lighting System
- HVAC and Mechanical Systems
- Plug Load Equipment

Utility Consumption:

- Electric Consumption and Costs
- Natural Gas Consumption and Costs

Sites Visited/Analyzed

- Belhaven Middle School
- Seaview Elementary School



Utility Cost Savings

Benchmarking



Belhaven Middle School

	RGY STAR [®] St ormance	atement of Energy			
39	Belhaven Midd Primary Property Typ Gross Floor Area (ft²) Built: 1995	e: K-12 School			
ENERGY STAR® For Year Ending: December 31,2017 Date Generated: November 12,2018 Score ¹ 1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for					
climate and business activity.	o assessment of a building s energy	y enclosely as compared with similar buildings nate	nimuo, aujuoting toi		
Property & Contact Informa					
Property Address Belhaven Middle School 51 Belhaven Ave Linwood, New Jersey 08221	Property Owner Linwood City Schoo 51 Belhaven Ave Linwood, NJ 08221	Primary Contact I District Teri Weeks 51 Belhaven Ave Linwood, NJ 08221 609-928-6700 teriweeks@linwoodschc	ols.org		
Property ID: 6582901					
Energy Consumption and E	nergy Use Intensity (EUI)				
Site EUI 69.5 kBtu/ft ² Annual Ene Natural Gas Electric - Gr Source EUI 138.7 kBtu/ft ²		National Median Comparison National Median Ste EUI (kBtu/ft [*]) National Median Source EUI (kBtu/ft [*]) % Diff from National Median Source EUI Annual Emissions Greenhouse Gas Emissions (Metric Tons C02e/year)	62.4 124.4 11% 601		
Signature & Stamp of \	/erifying Professional				
(Name) verify that the above information	on is true and correct to the best of my knowled	ge.		
Signature: Licensed Professional , ()	Date:				
		Professional Engineer Stamp (if applicable)			

Building Name	ENERGY STAR Score
Belhaven Middle School	39
Seaview Elementary School	45

ENERGY STAR Scores are percentile ranking from 1 (least efficient) to 100 (most efficient). It compares your building's energy performance to similar buildings nationwide.



All Opportunities

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (Ibs)
Lighting Upgrades	250,907	65.0	0.0	\$33,777.93	\$206,884.08	\$38,545.00	\$168,339.08	5.0	252,661
Install LED Fixtures	45,851	9.1	0.0	\$6,172.35	\$74,243.56	\$15,850.00	\$58,393.56	9.5	46,171
Retrofit Fluorescent Fixtures with LED Lamps and Drivers	64,964	22.0	0.0	\$8,751.92	\$54,009.45	\$5,525.00	\$48,484.45	5.5	65,418
Retrofit Fix tures with LED Lamps	139,821	33.9	0.0	\$18,817.12	\$76,386.19	\$17,170.00	\$59,216.19	3.1	140,799
Install LED Exit Signs	272	0.0	0.0	\$36.54	\$2,244.88	\$0.00	\$2,244.88	61.4	273
Lighting Control Measures	38,549	9.7	0.0	\$5,189.16	\$27,824.00	\$3,350.00	\$24,474.00	4.7	38,819
Install Occupancy Sensor Lighting Controls	38,549	9.7	0.0	\$5,189.16	\$27,824.00	\$3,350.00	\$24,474.00	4.7	38,819
Motor Upgrades	3,880	1.1	0.0	\$522.46	\$12,486.90	\$0.00	\$12,486.90	23.9	3,907
Premium Efficiency Motors	3,880	1.1	0.0	\$522.46	\$12,486.90	\$0.00	\$12,486.90	23.9	3,907
Electric Unitary HVAC Measures	23,675	13.2	0.0	\$3,189.24	\$132,301.36	\$5,437.50	\$126,863.86	39.8	23,841
Install High Efficiency Electric AC	22,209	13.1	0.0	\$2,991.73	\$125,494.48	\$5,161.50	\$120,332.98	40.2	22,364
Install High Efficiency Heat Pumps	1,466	0.1	0.0	\$197.51	\$6,806.88	\$276.00	\$6,530.88	33.1	1,476
Gas Heating (HVAC/Process) Replacement	0	0.0	7.2	\$83.16	\$9,095.79	\$1,600.00	\$7,495.79	90.1	848
Install High Efficiency Furnaces	0	0.0	7.2	\$83.16	\$9,095.79	\$1,600.00	\$7,495.79	90.1	848
HVAC System Improvements	6,447	0.0	0.0	\$868.50	\$5,437.68	\$0.00	\$5,437.68	6.3	6,492
Implement Demand Control Ventilation	6,447	0.0	0.0	\$868.50	\$5,437.68	\$0.00	\$5,437.68	6.3	6,492
Domestic Water Heating Upgrade	0	0.0	31.9	\$366.03	\$243.78	\$0.00	\$243.78	0.7	3,731
Install Low-Flow Domestic Hot Water Devices	0	0.0	31.9	\$366.03	\$243.78	\$0.00	\$243.78	0.7	3,731
Food Service Equipment & Refrigeration Measures	824	0.1	0.0	\$111.08	\$909.90	\$0.00	\$909.90	8.2	830
Refrigerator/Freezer Case Electrically Commutated Motors	824	0.1	0.0	\$111.08	\$909.90	\$0.00	\$909.90	8.2	830
Plug Load Equipment Control - Vending Machine	3,909	0.0	0.0	\$526.23	\$920.00	\$0.00	\$920.00	1.7	3,936
Vending Machine Control	3,909	0.0	0.0	\$526.23	\$920.00	\$0.00	\$920.00	1.7	3,936
TOTALS	328,191	89.1	39.1	\$44,633.79	\$396,103.49	\$48,932.50	\$347,170.99	7.8	335,064

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

Cost Effective Opportunities*



* Opportunities considered cost effective have a payback period less than 2/3rds of the useful life of the measure

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades	250,907	65.0	0.0	\$33,777.93	\$206,884.08	\$38,545.00	\$168,339.08	5.0	252,661
ECM 1 Install LED Fix tures	45,851	9.1	0.0	\$6,172.35	\$74,243.56	\$15,850.00	\$58,393.56	9.5	46,171
ECM 2 Retrofit Fluorescent Fixtures with LED Lamps and Drivers	64,964	22.0	0.0	\$8,751.92	\$54,009.45	\$5,525.00	\$48,484.45	5.5	65,418
ECM 3 Retrofit Fixtures with LED Lamps	139,821	33.9	0.0	\$18,817.12	\$76,386.19	\$17,170.00	\$59,216.19	3.1	140,799
Lighting Control Measures	38,549	9.7	0.0	\$5,189.16	\$27,824.00	\$3,350.00	\$24,474.00	4.7	38,819
ECM 4 Install Occupancy Sensor Lighting Controls	38,549	9.7	0.0	\$5,189.16	\$27,824.00	\$3,350.00	\$24,474.00	4.7	38,819
HVAC System Improvements	6,447	0.0	0.0	\$868.50	\$5,437.68	\$0.00	\$5,437.68	6.3	6,492
ECM 5 Implement Demand Control Ventilation	6,447	0.0	0.0	\$868.50	\$5,437.68	\$0.00	\$5,437.68	6.3	6,492
Domestic Water Heating Upgrade	0	0.0	31.9	\$366.03	\$243.78	\$0.00	\$243.78	0.7	3,731
ECM 6 Install Low-Flow Domestic Hot Water Devices	0	0.0	31.9	\$366.03	\$243.78	\$0.00	\$243.78	0.7	3,731
Food Service Equipment & Refrigeration Measures	824	0.1	0.0	\$111.08	\$909.90	\$0.00	\$909.90	8.2	830
ECM 7 Refrigerator/Freezer Case Electrically Commutated Motors	824	0.1	0.0	\$111.08	\$909.90	\$0.00	\$909.90	8.2	830
Plug Load Equipment Control - Vending Machine	3,909	0.0	0.0	\$526.23	\$920.00	\$0.00	\$920.00	1.7	3,936
ECM 8 Vending Machine Control	3,909	0.0	0.0	\$526.23	\$920.00	\$0.00	\$920.00	1.7	3,936
TOTALS	300,636	74.8	31.9	\$40,838.93	\$242,219.44	\$41,895.00	\$200,324.44	4.9	306,469

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.



Belhaven Middle School

	Energy Conservation Measure	Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (Ibs)
	Lighting Upgrades		115,737	38.1	0.0	\$15,592.09	\$126,987.28	\$22,155.00	\$104,832.28	6.7	116,546
ECM 1	Install LED Fixtures	Yes	20,037	4.8	0.0	\$2,699.32	\$49,210.00	\$10,900.00	\$38,310.00	14.2	20,177
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	64,964	22.0	0.0	\$8,751.92	\$54,009.45	\$5,525.00	\$48,484.45	5.5	65,418
ECM 3	Retrofit Fixtures with LED Lamps	Yes	30,737	11.3	0.0	\$4,140.85	\$23,767.84	\$5,730.00	\$18,037.84	4.4	30,952
	Lighting Control Measures		15,230	4.9	0.0	\$2,051.81	\$19,788.00	\$2,180.00	\$17,608.00	8.6	15,337
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	15,230	4.9	0.0	\$2,051.81	\$19,788.00	\$2,180.00	\$17,608.00	8.6	15,337
	Motor Upgrades		2,560	0.6	0.0	\$344.90	\$9,081.66	\$0.00	\$9,081.66	26.3	2,578
	Premium Efficiency Motors	No	2,560	0.6	0.0	\$344.90	\$9,081.66	\$0.00	\$9,081.66	26.3	2,578
	Electric Unitary HVAC Measures		22,063	12.3	0.0	\$2,972.27	\$122,579.25	\$4,999.50	\$117,579.75	39.6	22,217
	Install High Efficiency Electric AC	No	20,597	12.2	0.0	\$2,774.76	\$115,772.37	\$4,723.50	\$111,048.87	40.0	20,741
	Install High Efficiency Heat Pumps	No	1,466	0.1	0.0	\$197.51	\$6,806.88	\$276.00	\$6,530.88	33.1	1,476
	Gas Heating (HVAC/Process) Replacement		0	0.0	7.2	\$83.16	\$9,095.79	\$1,600.00	\$7,495.79	90.1	848
	Install High Efficiency Furnaces	No	0	0.0	7.2	\$83.16	\$9,095.79	\$1,600.00	\$7,495.79	90.1	848
	HVAC System Improvements		6,447	0.0	0.0	\$868.50	\$5,437.68	\$0.00	\$5,437.68	6.3	6,492
ECM 5	Implement Demand Control Ventilation	Yes	▼ 6,447	0.0	0.0	\$868.50	\$5,437.68	\$0.00	\$5,437.68	6.3	6,492
	Domestic Water Heating Upgrade		0	0.0	31.9	\$366.03	\$243.78	\$0.00	\$243.78	0.7	3,731
ECM 6	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	31.9	\$366.03	\$243.78	\$0.00	\$243.78	0.7	3,731
	Food Service Equipment & Refrigeration Measures		824	0.1	0.0	\$111.08	\$909.90	\$0.00	\$909.90	8.2	830
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	824	0.1	0.0	\$111.08	\$909.90	\$0.00	\$909.90	8.2	830
	Plug Load Equipment Control - Vending Machine		1,954	0.0	0.0	\$263.29	\$460.00	\$0.00	\$460.00	1.7	1,968
ECM 8	Vending Machine Control	Yes	1,954	0.0	0.0	\$263.29	\$460.00	\$0.00	\$460.00	1.7	1,968
	TOTALS FOR HIGH PRIORITY MEASURES		140,193	43.1	31.9	\$19,252.80	\$153,826.64	\$24,335.00	\$129,491.64	6.7	144,904
	TOTALS FOR ALL EVALUATED MEASURES		164,816	56.0	39.1	\$22,653.13	\$294,583.34	\$30,934.50	\$263,648.84	11.6	170,546

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.



Seaview Elementary School

Energy Conservation Measure	Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	-	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (Ibs)
Lighting Upgrades		135,170	27.0	0.0	\$18,185.83	\$79,896.79	\$16,390.00	\$63,506.79	3.5	136,115
ECM 1 Install LED Fixtures	Yes	25,814	4.3	0.0	\$3,473.03	\$25,033.56	\$4,950.00	\$20,083.56	5.8	25,994
ECM 2 Retrofit Fixtures with LED Lamps	Yes	109,084	22.7	0.0	\$14,676.27	\$52,618.35	\$11,440.00	\$41,178.35	2.8	109,847
Install LED Exit Signs	No	272	0.0	0.0	\$36.54	\$2,244.88	\$0.00	\$2,244.88	61.4	273
Lighting Control Measures		23,319	4.7	0.0	\$3,137.35	\$8,036.00	\$1,170.00	\$6,866.00	2.2	23,482
ECM 3 Install Occupancy Sensor Lighting Controls	Yes	23,319	4.7	0.0	\$3,137.35	\$8,036.00	\$1,170.00	\$6,866.00	2.2	23,482
Motor Upgrades		1,320	0.5	0.0	\$177.56	\$3,405.24	\$0.00	\$3,405.24	19.2	1,329
Premium Efficiency Motors	No	1,320	0.5	0.0	\$177.56	\$3,405.24	\$0.00	\$3,405.24	19.2	1,329
Electric Unitary HVAC Measures		1,613	0.9	0.0	\$216.97	\$9,722.11	\$438.00	\$9,284.11	42.8	1,624
Install High Efficiency Electric AC	No	1,613	0.9	0.0	\$216.97	\$9,722.11	\$438.00	\$9,284.11	42.8	1,624
Plug Load Equipment Control - Vending Machine		1,954	0.0	0.0	\$262.94	\$460.00	\$0.00	\$460.00	1.7	1,968
ECM 4 Vending Machine Control	Yes	1,954	0.0	0.0	\$262.94	\$460.00	\$0.00	\$460.00	1.7	1,968
TOTALS FOR HIGH PRIORITY MEASURES		160,172	31.7	0.0	\$21,549.58	\$86,147.91	\$17,560.00	\$68,587.91	3.2	161,292
TOTALS FOR ALL EVALUATED MEASURES		163,376	33.1	0.0	\$21,980.65	\$101,520.14	\$17,998.00	\$83,522.14	3.8	164,518

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.



Solar Energy Generation Potential 🖤

	Belhaven Middle School	Seaview Elementary School
Potential:	HIGH	HIGH
System Potential: (kW)	200	200
Electric Generation: (kWh per year)	238,274	150,489
Displaced Cost: (per year)	\$20,730	\$13,090

For more information on the SREC Registration Program (SRP) please visit:

http://www.njcleanenergy.com/renewable-energy/programs/solar-renewable-energy-certificates-srec/newjersey-solar-renewable-energy

Energy Efficient Best Practices

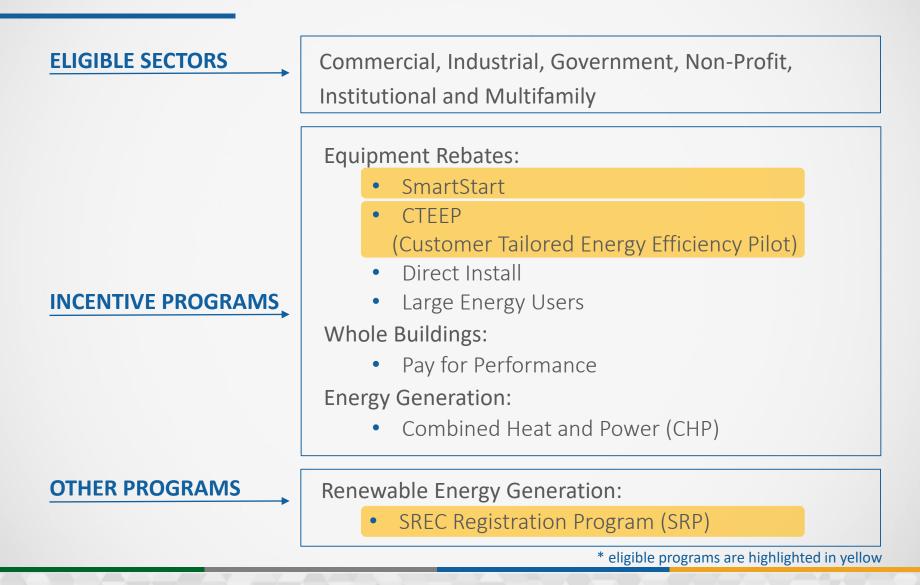


- Reduce Air Leakage
- Close Doors and Windows
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Use Fans to Reduce Cooling Load
- Use Window Treatments/Coverings
- Clean and/or Replace HVAC filters
- Check and Seal Duct Leakage
- Perform Boiler Maintenance
- Perform Water Heater Maintenance
- Plug Load Controls
- Water Conservation

See individual reports for specific EE practices by building

Clean Energy Program Portfolio





Recommended NJCEP Incentives per Building



Linwood City School District	SmartStart	СТЕЕР
Belhaven Middle School	Х	Х
Seaview Elementary School	Х	Х



SmartStart: Overview

- Two types of incentives for high efficiency equipment installation:
 - Prescriptive
 - Custom
- Project Categories:
 - New Construction
 - Renovation
 - Remodeling
 - Equipment Replacement
- Project pre-approval required for lighting and custom measures
- Incentives up to \$500,000 per electric account & \$500,000 per natural gas account
- Specific incentives and individual applications for Lighting, HVAC, VFDs, Refrigeration, Controls and more!

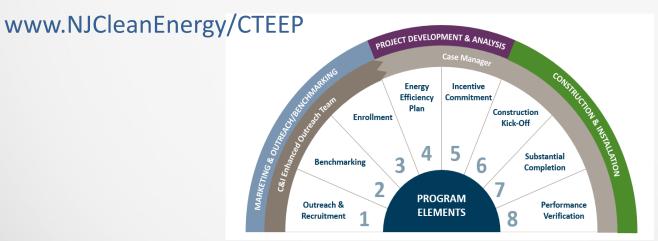
www.NJCleanEnergy/SSB



CTEEP: Overview

Customer Tailored Energy Efficiency Pilot (CTEEP)

- Provide customers with **on-site assistance** to discuss project opportunities and program incentives.
- A **single application** submission streamlines multiple prescriptive and custom measures.
- Provide **technical assistance incentives** to help offset soft costs associated with developing and planning an energy efficiency project.
- Incentives up to \$250,000 entity cap.



SmartStart, CTEEP & P4P:



Financing Option

- 0% Financing
- Up to \$130,000 for 10 years
- SJG can help guide you through the process

Contact:

Bruce Grossman – Program Manager

South Jersey Gas

#1 South Jersey Plaza

Folsom, NJ 08037

Phone: 609-561-9000, ext. 4271





Recommended NJCEP Incentives per Building

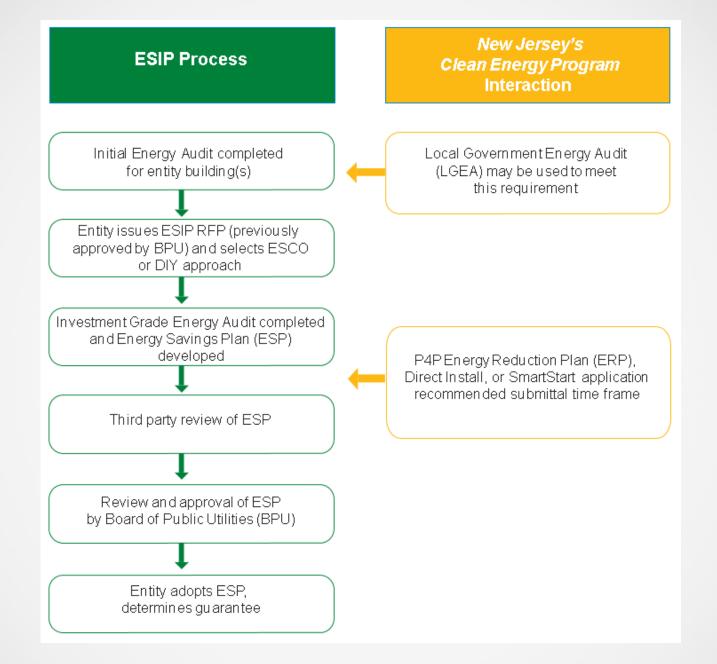


Linwood City School District	SmartStart	СТЕЕР
Belhaven Middle School	Х	Х
Seaview Elementary School	Х	Х



Energy Savings Improvement Program (ESIP)

- Provides alternative financing for energy savings projects at public institutions. Value of energy savings leveraged to pay for cost of EE projects over a 15 year contract. Does not count as debt/require voter approval.
- Requires an audit as 1st step (LGEA satisfies requirement)
- ESIP participation question on LGEA application
- Program administered directly by BPU





FOR MORE INFORMATION

ESIP

Mike Thulen ESIP Coordinator Office: 609-777-3338 Cell: 732-330-2419 ESIP@bpu.nj.gov

Questions



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FOR MORE INFORMATION

Visit NJCleanEnergy.com

Call (866) NJSMART

Gary Finger Regional Outreach Manager 856.780.8553 gfinger@trcsolutions.com