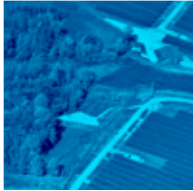


Innovative Energy



We look **holistically** at a project and propose **solutions** that **add value** and balance capital spending against **longterm operational costs**.

Our **Corporate Numbers**

Founded in
1955

100%
Employee Owned

Projects Completed in Over
75
Countries

80%
Business from Repeat Clients

100%
Canadian Owned



Who We Are

As a Platinum Club member of Canada's Best Managed Companies, J.L. Richards provides high-quality, fully integrated engineering, architecture, planning, and project management services to clients in the private and public sectors throughout Canada and internationally. Proudly 100% employee owned and completely Canadian, J.L. Richards has seven offices across Ontario supporting a wide variety of projects across seven key markets for nearly 70 years.

Our team of **energy systems experts** has been involved in groundbreaking, large-scale projects that have helped **set the bar for sustainable development**. They have also used their expertise to develop countless small-scale, **specialized energy innovations** in diverse client contexts throughout North America.

With unmatched experience in renewables and energy systems engineering, our Innovative Energy group has the insight and experience to **see solutions that you may never have even considered**.

Cohesive & Customized

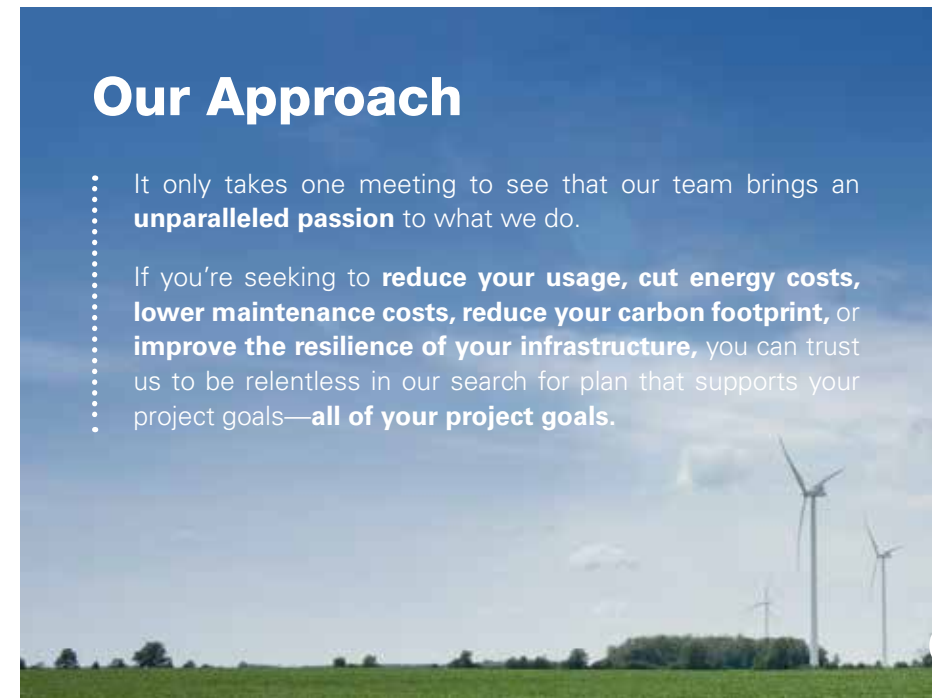
There are countless ways to reduce energy and carbon usage that are housed in every aspect of your project, from building materials to construction methodology. By tapping into the added advantage of J.L. Richards' expansive team of discipline-specific specialists, we can coordinate to identify opportunities that are truly unique to you.

Our team can examine your facilities as a complete system, support your energy planning, and assist you in navigating the evolving options available to you.

Our Approach

It only takes one meeting to see that our team brings an **unparalleled passion** to what we do.

If you're seeking to **reduce your usage, cut energy costs, lower maintenance costs, reduce your carbon footprint, or improve the resilience of your infrastructure**, you can trust us to be relentless in our search for plan that supports your project goals—**all of your project goals**.



1. Solar Air Heating System (Source: SolarWall®)
2. Bifacial Solar Modules (Source: PV Magazine)
3. Penn Energy Hamilton Solar Farm - Coburg, ON
4. Wind Turbine Farm - Brantford, ON

Cover: Solar Panels

Services

Energy management plans and energy strategy

Peak shaving and grid integration

Greenhouse gas emission evaluations

Detailed cost of energy, carbon, and lifecycle analysis

Energy audits and carbon reduction roadmaps

Feasibility studies

Building energy modelling

Design for retrofits and new builds

Owner's engineering advisory services

Independent engineering for investors

Performance verification

Climate lens assessments

Funding opportunities and application support

Renewable energy plans

District and campus energy system design

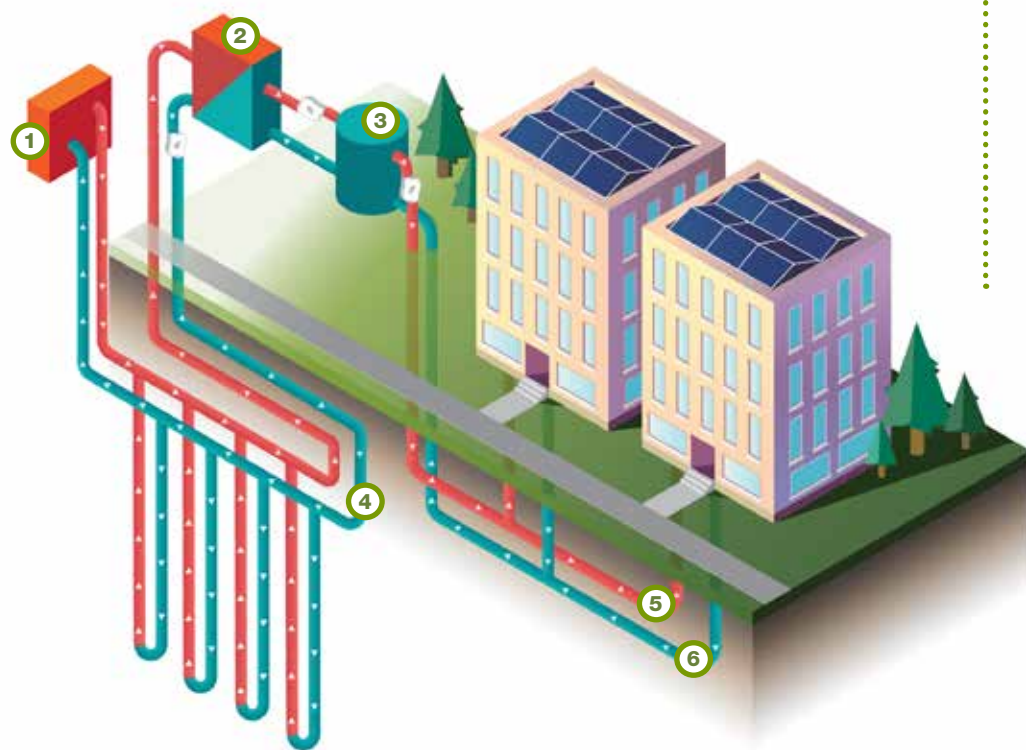
Zero-carbon design



When it comes to innovative energy supply and power solutions, **we've seen it all**. Some innovative energy infrastructure projects are driven by clients' **economic objectives** and some are motivated by **environmental interests**. No matter what you're attempting to achieve, we can design **electrical or thermal energy alternatives** that are just right for you, including complex, multitool, and multitechnology solutions.

Heat pumps offer electric-based heating that provides the same results as fossil fuel heating, but with a **50-90%** lower carbon footprint.

We can use heat pumps to supply renewable energy for all of your heating and cooling needs.



Renewable Energy Supply & Power

- 1. Additional heat supplies from solar, waste heat, etc.
- 2. Heat pumps
- 3. Buffer tank
- 4. Boreholes
- 5. Supply
- 6. Return



You can incorporate **low cost** and **durable** solar systems today that will last over **35 years**.

In recent years, there have been **more solar photovoltaic installations** than **any other electricity generation technology**.

Electric Alternatives

- Once considered too costly to implement, alternative electric technology like solar photovoltaics, wind generation, and battery energy storage systems are **competitive with conventional grid energy costs** today.
- Better still, these renewable systems have been proven to be **highly predictable energy generation** assets that are reliable and provide multiple benefits, such as **peak shaving** and **back-up power**.

Thermal Energy Options

- There are abundant options available that allow you to incorporate renewable heating and cooling to supply energy to your assets.
- Capturing waste heat, preheating ventilation air with passive solar energy, using heat pumps, wood pellet boilers, or biogas energy supplies, or incorporating thermal drywood energy storage are all ways you can **use your site to sustainably create and store energy**.

- 1. Installation of foundation piles for a solar farm
- 2. "Sawtooth" high-density rooftop solar array



2



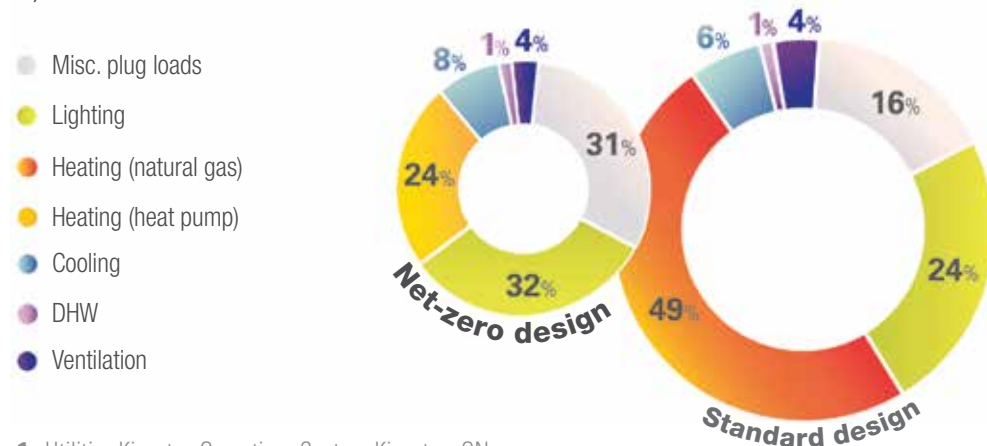
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J.L. Richards' multidisciplinary engineers and architects have been delivering innovative building designs that incorporate reliability, durability, maintainability, sustainability, and energy efficiency **for decades**.

Together, our renewable energy systems experts and extended multidisciplinary team have found a way to take high-performance building design to **new levels of energy performance and carbon footprint reduction**. Together, our buildings and energy experts produce designs for **truly remarkable high-performance buildings**.

Net-zero Design

Whether you're looking to upgrade an existing asset or start fresh with a new facility, we can optimize your energy systems and building envelope, and integrate innovative energy technology to help you **hit your net-zero energy and carbon goals**. With the reduced total energy demand of a net-zero design, the required energy can be generated on site by solar.



1. Utilities Kingston Operations Centre - Kingston, ON
2. Vale Living with Lakes Centre - Sudbury, ON

Customized Retrofits

Our approach to energy retrofitting in existing buildings is designed to make the most of your investment. We work with your existing assets to integrate retrofit options that **lower operational costs, reduce greenhouse gas emissions, and improve comfort and experience** for the individuals that occupy your space.

Energy Modelling

Understanding your energy supply and usage doesn't have to be a guessing game. Our team works with your existing data to develop models using **current and potential energy usage**. We then conduct **custom analysis** with highly dynamic energy modelling software to help you determine the best path forward for your building.

1. Solar panels
2. Optimized solar orientation
3. Solar shades
4. Solar air preheating
5. High-performance windows and doors
6. Enhanced insulation
7. Lighting and ventilation smart controls
8. Air seal and no thermal bridging
9. Air-source heat pump
10. Energy recovery ventilation
11. Mass timber construction



High-performance buildings

Each sustainable building project has access to the same ingredients to make it great, but the recipe will always be a bit different each time.

On every project, we look for the energy optimization options that are most appropriate to bring that specific building closer to carbon neutrality or zero-carbon performance.



Our municipal and institutional clients manage large portfolios of diverse assets, each with their own energy consumption patterns and asset renewal requirements. Often, for these clients, the hardest part of achieving **large-scale energy and carbon-reduction goals** is knowing where to start.

We audit greenhouse gas emissions and energy-use patterns, delivering detailed assessments that provide you with a holistic look at the full spectrum of energy options available. We then work with you to create **customized retrofit roadmaps** that align with your asset revitalization plans, so you know exactly which projects to push forward now and which you can incorporate in due time.

We can support single-facility projects, like town halls or wastewater treatment plants, and even provide plans that address your entire asset portfolio.

Large-scale assets like water or wastewater treatment plants are rich in opportunities to retrofit building systems and optimize energy infrastructure to support net-zero objectives.

Municipal & Institutional



No asset is too large or complex to target net-zero energy consumption.

Mining & Industrial



Mining and industrial processes result in highly energy-intensive operations. Luckily, this creates a unique opportunity to develop effective behind-the-metre energy supply systems and reduce energy consumption. Both options can reduce operational costs and mitigate the environmental impacts of mining and industrial operations.

Our experts work with your team to understand your site, processes, facilities, and energy cost structures so we can develop a complete sense of your current and future needs. We use that insight to design **practical and economical ways to improve your infrastructure.**

No matter the scale or complexity of your business, we can help you to **reduce your carbon reliance** and **incorporate renewable solutions** into the context of your operations and rate structure.

Did You Know?

Your processes may already be generating energy that can be repurposed to your advantage.

Even the heat generated from your everyday operations could be put to use with the right infrastructure in place.

1. Utilities Kingston Operations Centre - Kingston, ON
2. MacLeod Public School - Sudbury, ON
3. Corner Brook Wastewater Treatment Plant - Corner Brook, NL
4. West Nipissing Power Generation Turbine Replacement - Sturgeon Falls, ON

Members of J.L. Richards' Innovative Energy team have advised on the performance review of **\$5B in energy assets.**



1



2

Our deep understanding of renewable-energy technology has been put to use in an advisory capacity by **private clients, federal agencies, and provincial public utilities.**

We've helped diverse clients implement photovoltaic technology and establish algorithms to track performance, bifacial module performance, and snow losses.

Sometimes what you need isn't action—instead, it's advice you're after. We can provide you with the **expert insight** you need to establish an energy plan, sell stakeholders on your energy strategy, or conduct customized studies and asset analysis.

Whether you need a **consultant**, an **independent engineer**, or an **owner's engineer**, we have the skills and software to guide you through new technology integration and support you through the entire process.

Advisory Services



4



3

Talk To **Us** Today



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1. J.L. Richards Design Drawings
2. Penn Energy Hamilton Solar Farm - Coburg, ON
3. Energy Audit Site Visit (Source: NREL)
4. Coleman Mine Main Exhaust Fan - Sudbury, ON







Platinum
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www.jlrichards.ca

Architecture
Civil Engineering
Electrical Engineering
Energy Systems Engineering
Environmental Engineering
Mechanical Engineering
Planning
Project Management
Structural Engineering

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