



Environmental Performance  
Accountability Report

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# Environmental sustainability is everyone's story.



**fraserhealth**

Better health. Best in health care.



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# Our Focus Areas



**Active & Clean  
Transportation**



**Climate Risk &  
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**Smart Energy & Water**



**Workplace Leadership**



**Zero Waste & Toxicity**

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This is an interactive (clickable) report. You can easily navigate and link between sections and to areas that most interest you.

To view a report that is specific to one of the Lower Mainland health organizations, click on the name of the organization above. Each report details our GreenCare Focus Areas and programs, and the progress and achievements of the respective health authority.



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# Executive Message





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Welcome to the ninth annual Environmental Performance Accountability Report (EPAR). This report acknowledges the hard work, commitment, progress and success of everyone at Fraser Health in their continuing efforts to achieve environmental sustainability in all facets of our health system.

Given our climate reality, we all know that sustainable, low-carbon and climate-resilient health care is integral to the interdependent health of each of us, our communities and our planet. And, given the speed at which people, communities and health organizations responded to the pandemic in 2020, we know that through collaboration we can change rapidly and accomplish so much.

Over the past year, our health-care providers worked under tremendous pressure to transform our system in response to COVID-19. At the same time, and despite everything that was thrown at them, our staff and leadership continued to make

decisions that, by supporting the health of our environment, are essential to advancing human health.

Our **Green+Leaders** continued to push for and achieve environmental sustainability innovations and change. Our Capital Project and Facilities Maintenance teams prioritized and executed the design and construction of healthy and green health-care facilities and infrastructure, along with operational changes that result in tangible environmental and health outcomes. Departments across our health organizations challenged themselves to find ways to access resources and co-develop projects that stand as models of sustainability. And individuals at all levels of responsibility made decisions to expand active and clean transportation; improve energy and water-use efficiency; build greater health system climate resilience; support and strengthen opportunities for staff engagement; and develop new strategies to further reduce waste.

All of this dedicated work has marked a clear path for health care that will not simply help us to reduce the harm our activities cause to our environment and health, but allow us to build a truly healing system.

As you read this report, I encourage you to take pride in the collective efforts of everyone at Fraser Health, consider the vital importance of continued sustainability actions, and centre your decisions on Fraser Health's purpose: to improve the health of the population and the quality of life of the people we serve.



**Mauricio A. Acosta**

Executive Director, Facilities Management  
and Business Performance (VCH)



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is everyone's story.





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This 2020 Environmental Performance Accountability Report represents the collective work of many individuals whose impact extends beyond their immediate workplace, across the health system, and into our communities. They have made environmental sustainability, low-carbon and climate-resilient care a priority while continuing to advance health and wellness for every person.

As a regional collaborative service, the Energy and Environmental Sustainability (EES) team has had the honour of partnering with the staff of the four Lower Mainland health organizations — [Fraser Health](#), [Providence Health Care](#), [Provincial Health Services Authority](#), and [Vancouver Coastal Health](#) — providing expertise and resources, and facilitating programs that promote and support healthy and healing design, construction and operations.

2020 was a particularly challenging year for health care due to COVID-19, coupled with the difficulties created by pandemic response measures. Despite this, Fraser Health continued to take meaningful action in respect to each of the five, interdependent GreenCare Focus Areas — Active & Clean Transportation, Climate Risk & Resilience, Smart Energy & Water, Workplace Leadership, and Zero Waste & Toxicity — which provide a framework for addressing climate change and the environmental and health impacts of delivering patient care.

Fraser Health's environmental sustainability story is always being co-created, including its successes, challenges and next steps. This report presents Fraser Health's sustainability goals, targets and performance metrics, along with stories of partnerships and staff that are impacting our health-care sites.

This report speaks to our capacity for change; our commitment to each other, our place and our planet; and our resilience. It is a means of reflecting on what we've done and celebrating our achievements. But it's also a reminder that there is still much to be done, and that we must work together to do it.

**Because environmental sustainability is everyone's story.**



## 2020 Dashboard highlights

# 19.3%

decrease in greenhouse gas emissions  
intensity since 2007

# 23.5%

decrease in water-use intensity since 2010

## 2020 milestones

- Development of the Climate Resilience Design Guidelines (December 2020) for capital projects
- Implementation of infrastructure projects that are expected to reduce carbon emissions by more than 1,200 tCO<sub>2</sub>e per year
- Dispensing \$1,000 in seed funding to Fraser Health Green+Leaders for greening their workplace projects
- Reducing unnecessary plastics and packaging in maternity clinical supplies, resulting in a cost savings win of 20%



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# 1.2 The 2020 Dashboard: Setting Sustainability Targets and Measuring Results

2020 is a milestone reporting year. The traffic lights indicate whether or not we met the targets set for 2020, helping us to reflect on what is achievable and what requires a shift in action moving forward. In some cases, we will be considering new targets, including 2025 key performance indicators, to help us assess our journey. And in others, we will be strengthening our partnership approach in order to increase impact as we move towards our 2030 targets. Captured in the 2020 Dashboard, these targets and KPIs help us all to determine challenges, recognize successes, and guide the

actions we need to take to transform our health-care system toward environmentally sustainable and climate-resilient care for healthy people, place and planet. Since targets and KPIs are still being determined for Climate Risk & Resilience, this Focus Area is not included in the dashboard.



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# Active & Clean Transportation

Goal: Ensure a health-care system in which employees, patients, and visitors commute and travel in a manner that reduces pollutants and emissions, minimizes the need for onsite parking, and increases overall health and wellness.

Target*	Key Performance Indicators (KPI)	Baseline	2020 Results	Traffic Light	2020 Target	2030 Target
Increase staff commuting by active and clean transportation modes.	Percentage of staff commutes made by active and clean modes	2016	30%	●	35%	50%

\* This Focus Area is currently under review, including identification of new targets and KPIs.

- 2020 target met or exceeded
- 2020 target within sight; work in progress
- 2020 target not met and requires attention



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# Smart Energy & Water

Goal: Minimize energy and water consumption and GHG emissions to reduce costs and environmental impacts, helping to ensure the health and wellness of our living environments.

Target	Key Performance Indicators (KPI)	Baseline	2020 Results	Traffic Light	2020 Target	2030 Target
Reduce energy-use intensity (EUI) of core sites.*	EUI (ekWh/m <sup>2</sup> /year)	2007	13.5%	●	15%	25%
Reduce absolute in-scope GHG emissions.**	GHG emissions (tCO <sub>2</sub> e/year)	2007	-9.0%	●	5%	50%
Reduce in-scope GHG-emissions intensity.	GHG-emissions intensity (tCO <sub>2</sub> e/year/m <sup>2</sup> )	2007	19.3%	●	15%	50%
Reduce building water (use) performance intensity (BWPI) of core sites.	BWPI (m <sup>3</sup> /m <sup>2</sup> /year)***	2010	23.5%	●	20%	25%

\* Core sites are defined as primarily owned health-care facilities that can be actively monitored for energy, water and waste data.

\*\* Absolute emissions refers to total emissions regardless of growth change and weather variation. In-scope emissions are from owned and leased buildings, fleet travel and paper use (as defined by the [Climate Change Accountability Act](#)).

\*\*\* Although facility space is used as an intensity metric for water, it's important to note that total water consumption is influenced by facility staff count, processes, procedures and equipment.

- 2020 target met or exceeded
- 2020 target within sight; work in progress
- 2020 target not met and requires attention



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# Workplace Leadership

Goal: Together, reach, engage and inspire health-care staff to be leaders who share a commitment to and passion for healthy, sustainable and thriving communities, workplaces and environments.

Target*	Key Performance Indicators (KPI)	Baseline	2020 Results	Traffic Light	2020 Target	2030 Target
Increase the number of Green+Leaders across the organization.**	Number of staff joining the Green+Leaders program annually	n/a	7	●	12	14

\* This Focus Area is currently under review, including identification of new targets and KPIs.

\*\* In previous years, this target was measured as a proportional increase in Green+Leaders. It was decided that using numbers will provide more accurate and meaningful information for monitoring. A refresh of the engagement metrics will take place in 2021.

● 2020 target met or exceeded

● 2020 target within sight; work in progress

● 2020 target not met and requires attention



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# Zero Waste & Toxicity

Goal: Minimize waste generated and toxic chemicals used by the health-care system and supporting operations.

Target	Key Performance Indicators (KPI)	Baseline	2020 Results	Traffic Light	2020 Target	2030 Target
Increase waste-diversion rates at existing acute and long-term care sites.*	% of waste diverted (annual average)	n/a	40%**	●	50%	50%
Decrease waste-intensity rates at existing acute and long-term care sites.	Waste intensity (kilograms/m <sup>2</sup> /year)	n/a	18.1	●	15.0	12.0

\* Waste-diversion data does not include segregated bio-medical waste.

\*\* In 2020, our waste diversion reflects only waste segregation, as our recycling provider paused the collection of recycling due to concerns for staff safety during the COVID-19 pandemic. All recycling and general garbage streams were instead taken to a local waste-to-energy facility.

● 2020 target met or exceeded  
● 2020 target within sight; work in progress  
● 2020 target not met and requires attention



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# 2.0 Our Story





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# 2.1 Fraser Health

## Our vision

Better health. Best in health care.

## Our purpose

To improve the health of the population and the quality of life of the people we serve.

## Our values

Respect, caring and trust characterize our relationships.

## Our commitment

- ▶ To be passionate in pursuit of quality and safe health care
- ▶ To inspire individual and collective contribution
- ▶ To be focused on outcomes, and open to evidence, new ideas and innovation
- ▶ To embrace new partners as team members and collaborators
- ▶ To be accountable

## Our dedication to sustainability

Achieving energy and environmental sustainability is a priority for Fraser Health. To achieve this, in our [environmental sustainability policy](#), Fraser Health is mindful of the importance of developing a triple-bottom-line approach to sustainability, which balances ecological, societal and economic imperatives, and recognizes the link between a healthy environment and a healthy population. As such, we recognize our duty to minimize our environmental impact through leadership and strategic partnerships, facility construction and operations.

## Our region

Fraser Health is the largest health authority in B.C., delivering a wide range of health-care services to more than 1.8 million people within 20 municipalities.

The communities served by Fraser Health are as diverse culturally as they are geographically and include First Nations residents associated with 32 bands, new Canadians, and refugees. Facilities and services are designed to provide each patient (from newborns to centenarians) with the right care at the right time and place, whether in hospital, in an outpatient clinic, in a centre for mental health and substance use, or at home.

## Our services<sup>A</sup>



12 acute-care hospitals from Burnaby to White Rock to Hope



An outpatient care and surgery centre



7,760 long-term care beds



Mental health care, public health, home health services and community care

## Our direct care providers

More than 40,000 employees, physicians and volunteers at Fraser Health — including 20,738<sup>B</sup> full-time staff — are committed to the values of respect, caring and trust in pursuit of providing the best health care possible to every individual across the region.

Many of these individuals understand and are taking action to reduce environmental risks and increase climate resilience, particularly through their support of and participation in Energy and Environment Sustainability (EES) strategies and programs in the workplace. They have made environmental sustainability their story, as demonstrated by their participation in the Green+Leaders program and their success stories throughout this report. Given the tools and opportunity, they will continue to play a key role in transforming health care.



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## Senior executive team\*

“

Providing health services uses significant resources with a significant ecological footprint. Unfortunately, our impacts have been exacerbated due to the COVID-19 pandemic as we necessarily implemented enhanced infection prevention and control measures such as utilization of single-use personal protective equipment. Climate change is one of the most critical global health issues that we face today. While we need to use energy, water and single-use products to deliver safe care and services, we also know that we must be mindful of how this impacts the finite resources of our physical environment. I encourage all of us to reduce our ecological footprint wherever possible and to use our resources responsibly to protect our planet for both ourselves and for future generations.

– Victoria Lee, President and Chief Executive Officer, Fraser Health



**Dr. Victoria Lee**  
President and Chief Executive Officer



**Dermot Kelly**  
Vice-President, Quality, Access and Flow



**Dr. Ralph Belle**  
Vice-President, Medicine



**Cameron Brine**  
Vice-President, Employee Experience



**Brent Kruschel**  
Vice-President, Informatics,  
Technology and Facilities



**Naseem Nurany**  
Vice-President, Communications  
and Public Affairs



**Dr. Elizabeth Brodtkin**  
Vice-President, Population Health,  
and Chief Medical Health Officer



**Laurie Leith**  
Vice-President, Acute  
and Community Care



**Norm Peters**  
Vice-President, Regional Care Integration



**Linda Dempster**  
Vice-President, Pandemic  
Preparedness and Response



**Brenda Liggett**  
Vice-President, System Optimization,  
and Chief Financial Officer

\* As of August 2021



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## Building for energy and environmental sustainability

In design and construction of new facilities (i.e. project planning, design and construction teams), Fraser Health is supporting the highest level of human and environmental health and well-being by:

- ▶ Assessing and reducing the impacts of climate change on a facility and the surrounding community
- ▶ Determining how the design, construction and operation of a facility will impact the environment (energy, water, carbon and waste impacts) and human health
- ▶ Developing low-carbon, climate risk and resilience and environmental sustainability strategies
- ▶ Achieving LEED accreditation (a globally recognized green-building rating system administered by the [Canadian Green Building Council](#))
- ▶ Meeting and exceeding environmental and climate change regulations
- ▶ Drawing on credible evidence that links health outcomes to planning and design of the built-environment (re: [The Healthy Built Environment Linkages Toolkit](#))

## Our buildings<sup>C</sup>

# 726,495 m<sup>2</sup>

usable facility space

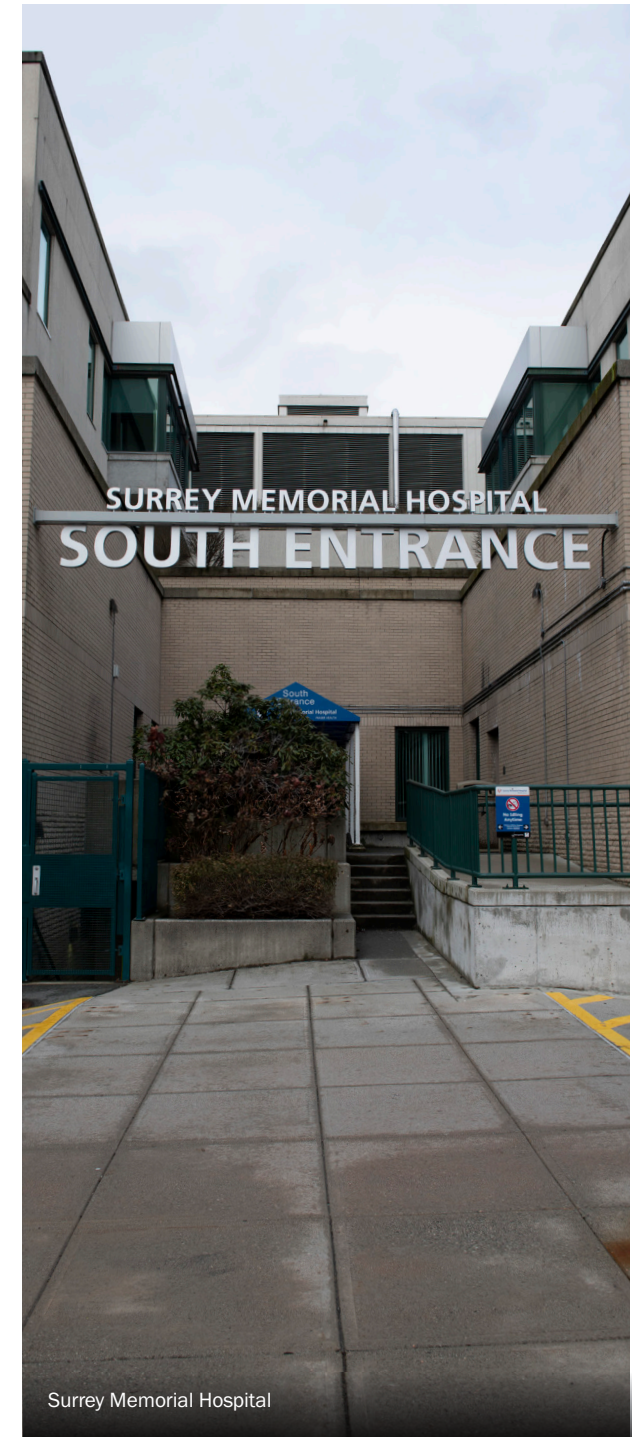
# 172

distinct buildings

“

**As a manager of facilities, I appreciate the relationship we have with the Energy and Environmental Sustainability (EES) team. Facilities Maintenance is a major consumer of energy in the health authority, but the EES team has worked collaboratively on a number of projects to improve the operation and make sure our equipment is optimized to reduce our impact on the environment.**

– Rick Molnar, Senior Manager, Facilities Maintenance and Operations, and Green+Leader, Fraser Health



Surrey Memorial Hospital



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Our LEED projects

Certification Date	Project Name	Certification Level	City	Project Size (m²)
Pending	Royal Columbian Hospital Redevelopment Project – Phase Two Acute Care	-	New Westminster	85,200
Pending	Burnaby Hospital Redevelopment – Phase One	-	Burnaby	12,696
Pending	New Surrey Hospital and Cancer Centre	-	Surrey	46,980
Pending	Delta Hospital Lab & Medical Imaging Expansion Project	-	Delta	1,770
2021-06-10	Royal Columbian Hospital Redevelopment Project – Phase One	Gold	New Westminster	18,115
2015-07-20	Mission Community Health Project – Complex Residential Care	Gold	Mission	12,962
2014-11-26	Surrey Memorial Hospital Critical Care Tower	Gold	Surrey	57,900
2013-04-22	Czorny Alzheimer Centre – Phase 2	Gold	Surrey	3,158
2012-10-11	Maxxine Wright Place	Gold	Surrey	4,406
2012-10-11	Creekside Withdrawal Management Centre	Certified	Surrey	2,415
2012-09-19	Jim Pattison Outpatient Care and Surgery Centre	Gold	Surrey	32,179
2011-04-19	Chilliwack Hospital Redevelopment	Certified	Chilliwack	3,278
2010-06-23	Good Samaritan Canada, Victoria Heights Assisted Living	Certified	New Westminster	8,668
2010-03-19	Czorny Alzheimer Centre	Certified	Surrey	3,107
2009-09-10	Abbotsford Regional Hospital and Cancer Centre	Gold	Abbotsford	60,000
2008-12-17	CareLife Maple Ridge	Silver	Maple Ridge	9,777
2007-09-14	Cottonwood Lodge – A Fraser Health Residential Mental Health Facility	Gold	Coquitlam	1,384

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## 2.2 The Energy and Environmental Sustainability Team

The Energy and Environmental Sustainability (EES) team was created in 2010 to ensure that a collaborative environmental sustainability approach is taken across the Lower Mainland health organizations (LMHOs) — Fraser Health, Providence Health Care, Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH).

Since then, we've partnered with many departments, teams and individuals to integrate and enhance sustainability infrastructure and practices in a variety of projects and programs, and made health and wellness central to our work.

The EES team is driving the push for environmentally sustainable and resilient health care, but can't do it alone.

### Embedding environmental health and wellness

Founded and led by the EES team, GreenCare is a network that unites efforts within the B.C. health-care community to transform our health-care system toward environmentally sustainable and resilient care. By connecting diverse groups across the LMHOs, GreenCare amplifies and celebrates projects, programs and staff actively working to address our climate reality. The [GreenCare website](#) acts as a home and resource to support these efforts.

Due to evolving changes to legislation and health-care priorities, in 2020 the EES team initiated a refresh of the GreenCare Strategic Framework to better meet the needs of the health-care sector. Completed in 2021, the updated framework reflects the diversity of individuals across the health system and the value in creating equity for all; the interdependent nature of people, place and planet; and the importance of building relationships that are inclusive, accountable and respectful. With this reimagined framework,

and upcoming new targets and KPIs for 2025 and 2030, we are excited to increase our focus on relationship building and collaboration, so that our health-care systems, staff, leadership and communities are empowered to meet the sustainability challenges ahead.

In spite of the new challenges that the pandemic brought in 2020, I know how hard the EES team has been working. While adapting to 2020's exceptional circumstances, they have continued to make sustainability and resilience a priority, as shown throughout this report. I also know how proud the team is of Fraser Health staff and leadership's efforts to continue to embed environmental sustainability within our health-care system.

Given our climate reality, none of us can afford to be complacent. Our well-being, our future, and our friends, family and children depend on our ability and willingness to continue to change how we live and work. We know what to do, we know how, and we know we can. Let's move forward, together.



**Robert Bradley**  
Director of Energy & Environmental Sustainability

**Meet the EES Team.**



Abbotsford Regional Hospital & Regional Centre



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# 3.0 We're Finding Solutions: Together.





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# 3.1 Our GreenCare Focus Areas

To reduce the risks of our climate reality and the environmental impacts of health-care construction and operations, we must all take clear, meaningful action. The GreenCare Focus Areas are essential to this action and have been developed in consideration of the interdependent nature of healthy people, places and planet. None of these Focus Areas exists in a silo: activities and actions in one area have real impacts on the others. In this way, energy and environmental sustainability is a holistic endeavour that requires a unified, coordinated approach that engages all stakeholders in every part of the health-care system.

In order to support meaningful change, each of the following Focus Areas, with the exception of Climate Risk & Resilience, identifies a goal and a number of targets, along with measurable Key Performance Indicators (KPI) that determine our progress. In some cases, a target is influenced by but not necessarily aligned with provincial or regional mandates. By pursuing these targets and tracking these KPIs in collaboration with key partners, Fraser Health can assess its progress and achieve environmental sustainability.



Active & Clean  
Transportation



Climate Risk  
& Resilience\*



Smart Energy  
& Water



Workplace  
Leadership



Zero Waste  
& Toxicity

\* Targets and KPIs for Climate Risk & Resilience are currently under development and were not in place for 2020.



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# 1. Active & Clean Transportation

## Our goal

**Ensure a health-care system in which employees, patients, and visitors commute and travel in a manner that reduces pollutants and emissions, minimizes the need for onsite parking, and increases overall health and wellness.**

Working towards this goal, active transportation reduces the risk of disease, the effects of psychological stress and the negative physical impact of a sedentary lifestyle. Active, or human-powered, transportation also provides environmental benefits, as an alternative to fossil-fuel-powered transportation. Modes include walking/rolling, cycling, running, and the use of human-powered or hybrid mobility aids such as wheelchairs, scooters and e-bikes. Clean transportation features modes that reduce greenhouse gas (GHG) emissions and contribute to environmental and human health by providing vehicle alternatives to single occupancy vehicles that consume gas and diesel. These include public transit, electric vehicles, plug-in hybrid vehicles, carpooling and electric scooters.

## Our targets

**Increase staff commuting by active and clean transportation modes.**



## Our partners

BC Hydro

Climate Action Secretariat

Integrated Protection Services, Commuter Services

PHSA Supply Chain

Population Public Health

## Current programs include:

The Active & Clean Transportation Focus Area is currently undergoing review and revitalization. This process will include close alignment of strategy and targets with municipal strategies, **CleanBC** and Canada's first national active transportation strategy (under development). The EES team will work closely with key stakeholders within Fraser Health and across the four Lower Mainland health organizations to engage with staff, patients and visitors to increase access to and use of active and clean transportation modes when commuting, and when travelling to and between health-care facilities.





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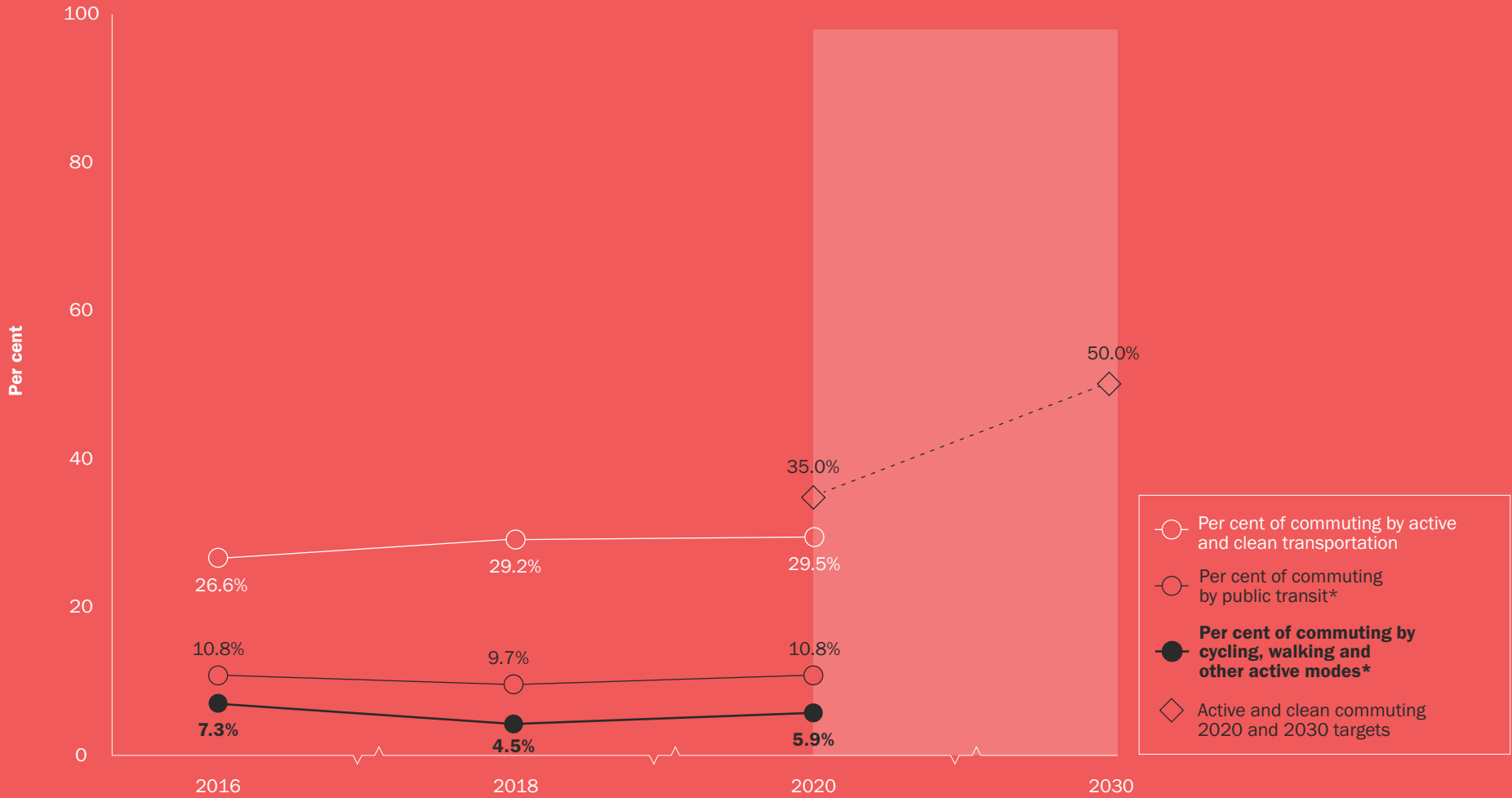
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# Active and Clean Commuting

Our goal is to support and encourage staff to choose alternative modes of transportation to gas or diesel single occupancy vehicles and to choose active and clean modes, such as electric vehicle, public transit, walking/rolling and cycling. By measuring commuter behaviour

and understanding how behaviour changes over time, we can more accurately direct our work and support staff in choosing commuting options that have a lower environmental impact.

**There has been no trend or significant change** in commuter behaviour in Fraser Health. Staff reported that 29% of commutes were replaced with working from home, which we can assume decreased the environmental impact associated with commuting.



\* For reference only. No associated targets.

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# Accessibility matters

Understanding accessibility is a key component to understanding staff commuting behaviour. It is also an important component when considering the needs of staff, and what they require from their commuting and transportation modes.

## What do staff report as accessible and practical commuting options?<sup>E</sup>

**72%**

Gas/diesel single occupancy vehicle

**29%**

Public transit

**10%**

Cycling

**11%**

Walking/rolling

Despite being reported as an accessible and practical commuting option by 30% of staff, only 10% of commutes occurred by transit. The EES team is working to narrow the gap between what staff report as accessible and practical and what modes of transportation are actually being taken for commuting. Additionally, the EES team is working to increase the accessibility of different active and clean transportation modes.

The EES team also recognizes that, due to different requirements related to mobility, family and work, some staff will always rely on single occupancy vehicles for transportation. Understanding the different accessibility requirements of staff allows the team to understand what types of active and clean transportation need more resources or support in different regions. Active transportation modes are not accessible to the majority of staff, which may be an indicator that clean transportation modes, such as public transit and electric vehicles, are more feasible options for Fraser Health staff.





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# Connections

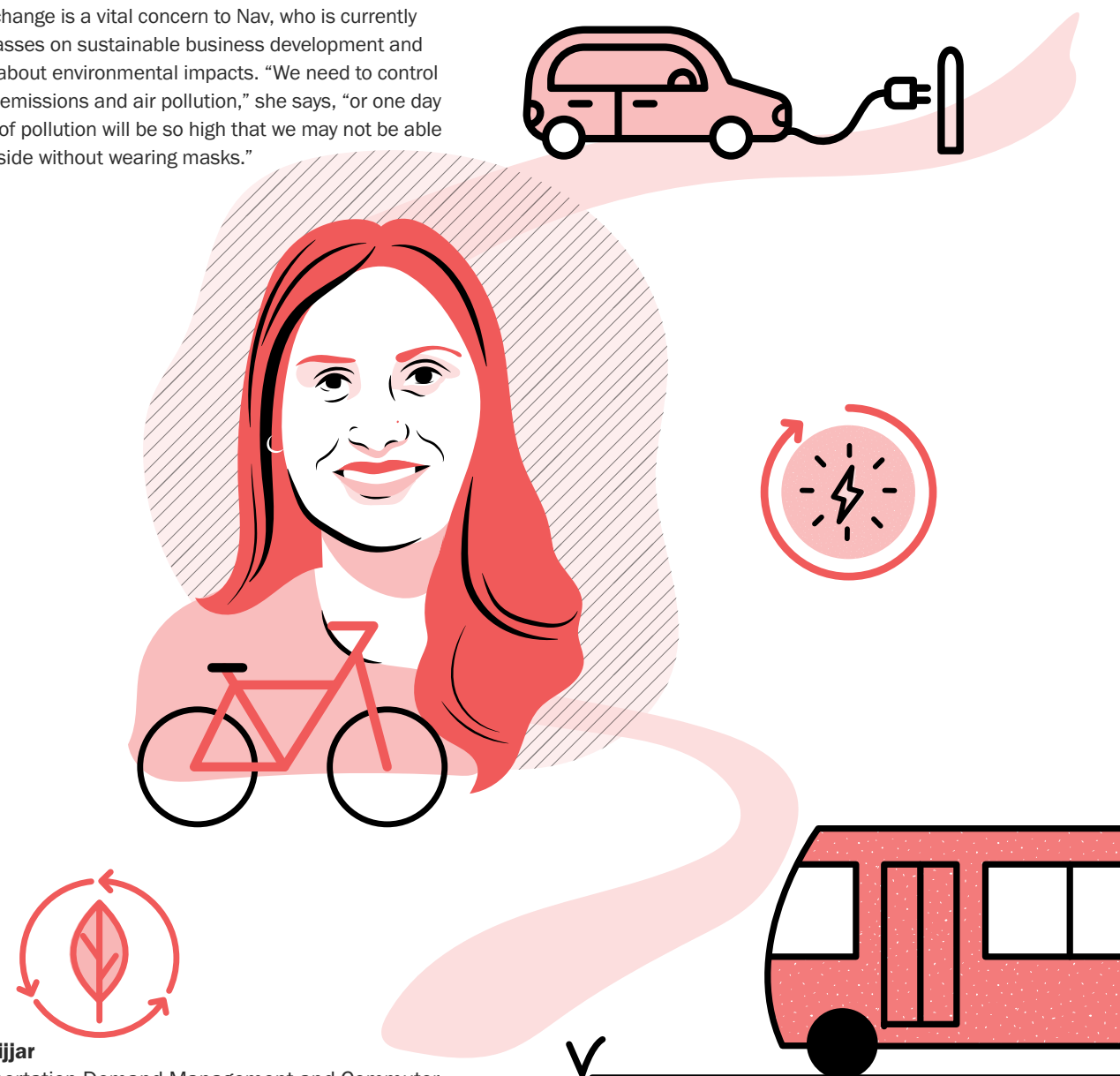
Nav Nijjar's work on sustainable transportation initiatives is influenced by the people she meets. "I connect with individuals who have changed their lifestyles to leave a positive impact on the environment," she says.

In her role as Transportation Demand Management and Commuter Services lead, Nav collaborates with organizations such as TransLink and Hub Cycling to promote public transportation and biking to work. Nav then provides data to the EES team on employee use of public transportation and the hospital shuttle service, bike cages and bike racks, and electric vehicle charging stations. But her ties with the team don't end there.

The EES team and the GreenCare community have introduced Nav to important opportunities and connections and provided invaluable support to her work. For a recent project in which Nav sought new electric vehicle chargers for one hospital, the team introduced her to critical partners and funding programs. "I wasn't aware of all the opportunities and grants that were available in our workplace," Nav says. "The EES team helped our department find viable options with the current government grants to get the most out of our project. ... [and] uses a collaborative approach and works with all the partners for the benefit of health-care employees."

Nav is proud of the health authorities' work to advance green practices, and she values the relationships she has built inside the health authorities as much as those developed externally. She believes that health-care employees "should become leaders in adopting sustainable alternatives, and our organizations' strategies should align with the Government of British Columbia's CleanBC program."

Climate change is a vital concern to Nav, who is currently taking classes on sustainable business development and learning about environmental impacts. "We need to control our GHG emissions and air pollution," she says, "or one day the level of pollution will be so high that we may not be able to go outside without wearing masks."



**Nav Nijjar**

Transportation Demand Management and Commuter  
Services Lead, Integrated Protection Services

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## OUR STORY

# Pilot shows that "smart controllers" decrease cost and demand from electric vehicle charging stations

Fraser Health currently has 40 Type 2 electric vehicle (EV) charging stations across six hospital sites. With the CleanBC commitment to 100% of vehicles sales being electric by 2040, and 37% of Fraser Health staff planning to own an electric vehicle in the next five years,<sup>E</sup> the EES team knows that a significant electrical demand could be placed on hospitals.

In 2019, the Facilities Maintenance team at Burnaby Hospital approached the EES team with concerns about power demand caused by use of eight new EV charging stations. With support from BC Hydro, a pilot project was created, with the goals of monitoring and managing the EV-charging electrical load. In the initial phase of the pilot project, using a "smart controller" with an algorithm that manages demand will help to understand the impact to the hospital electrical systems and the ability to manage those impacts while providing EV charging.

Since the pilot started in 2020, results include:

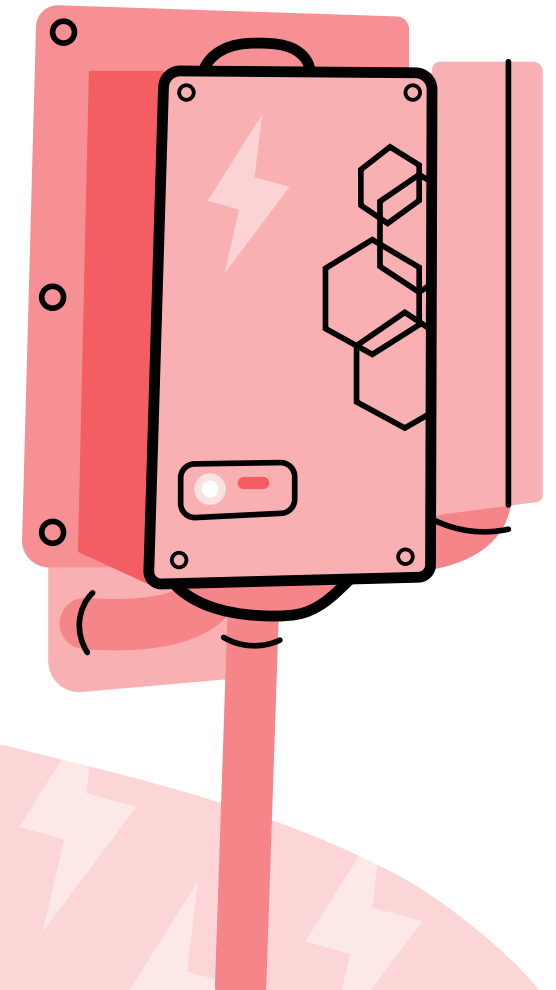
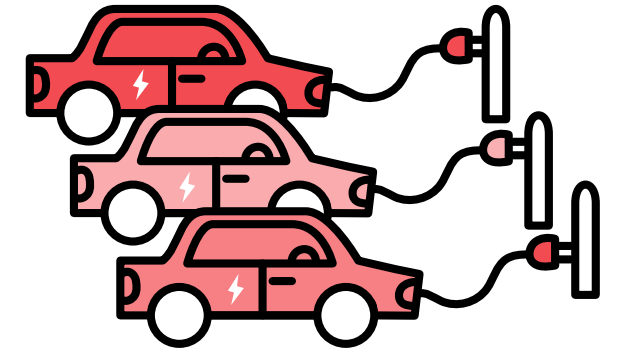
- ▶ The smart controller reduced combined EV charger power demand by 50% (at a predetermined "test" time, from 5 p.m. - 9 p.m.).
- ▶ Charging stations are most often used from 7 a.m. - 12 p.m.
- ▶ A minimum of 2-3 charging stations are in use at all times.

The smart controller was able to reduce power consumption quickly and, for a short period, avoid spikes in consumption (also known as load "shaving" or "shedding"). This system can also rotate charging among the plugged-in cars and prioritize vehicles that need the charge the most.

In the next step, we'll integrate the smart controller into Burnaby Hospital's internal network of power meters and building operation controls. This will not only enable

adjustment of power to the EV charging stations in response to the needs of the hospital, but will also allow for close monitoring and metering for continual improvement.

This pilot was an important first step and will inform future planning and expansion of EV-charging infrastructure across Fraser Health, and help increase staff use of clean modes of transportation.





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## What do Fraser Health staff have to say about electric vehicles (EVs)?<sup>E</sup>

**8%**

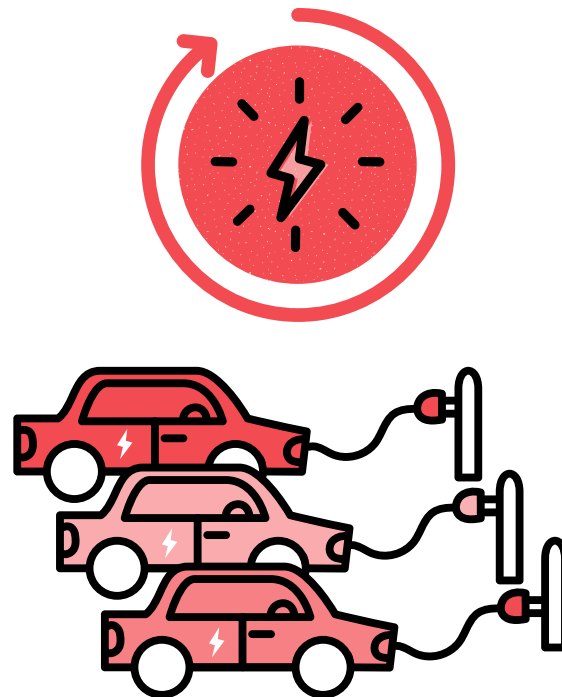
currently own an EV.

**37%**

plan to own an EV in the next five years.

**38%**

are unsure about owning an EV.



## Our successes

While there weren't any significant changes in transportation mode share (i.e. the proportion of commuting by different transportation options), we do know that in 2020 many staff were working from home, eliminating the negative social, financial and environmental impacts resulting from their commuting to work. Additionally, EV ownership has increased amongst Fraser Health staff, which is especially important considering such a great proportion of staff rely on single occupancy vehicles to commute. We expect that electric vehicle ownership and use for commuting will continue to increase, decreasing the negative impacts of staff moving to and from work.

## Challenges we face

Fraser Health is the largest health authority, by population, in British Columbia. Because of the range of locations, the remoteness of some of its facilities, and the distance and location from which many staff commute, promoting active and clean transportation can be challenging. Oftentimes, commuting via cycling or by walking/rolling may not be an option for staff. Similarly, facility location may mean that staff do not have access to established transit networks, cycling networks, or carsharing and carpooling programs, with 23% of Fraser Health staff reporting that, because they lived too far from work, cycling was not an accessible or practical commuting option for them. Increasing understanding of the travel requirements for staff commuting is essential as the EES team works to increase active and clean transportation in Fraser Health.

“  
**I started driving after 12 years  
of commuting on public transit,  
for safety reasons.**

– GreenCare Survey respondent

## COVID-19 has impacted staff behaviour when it comes to transportation

The pandemic has had an impact on how PHC staff commute. 20% of the commutes that normally would have occurred were replaced with working from home, essentially eliminating the negative environmental impacts associated with those commutes. Of the commutes that remained, there was a significant drop in commuting by public transportation and an increase in single occupancy vehicle use, a trend that was seen throughout the province. However, the percent of commutes by active transportation such as cycling and walking also increased, after having remained steady the last four years.

## The work isn't finished

The 2030 and 2040 zero-emission vehicle targets set out in the CleanBC plan (30% and 100% respectively) are an important part of Fraser Health's roadmap to clean transportation. Electric vehicle (EV) ownership has increased amongst Fraser Health staff since 2018: 8% of staff currently own an EV. In the last two years, more Fraser Health staff have purchased EVs, more staff have plans to own an EV, and more staff have an increased interest in or are considering the option of owning an EV. With these increases, the EES team is investigating opportunities to not only support the growing demand for infrastructure but accelerate the shift to low-carbon communities. A part of this process will include the execution of a baseline and feasibility study to understand the demand, challenges and opportunities that come with EVs, and the implementation of infrastructure throughout Fraser Health facilities.

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## 2. Climate Risk & Resilience

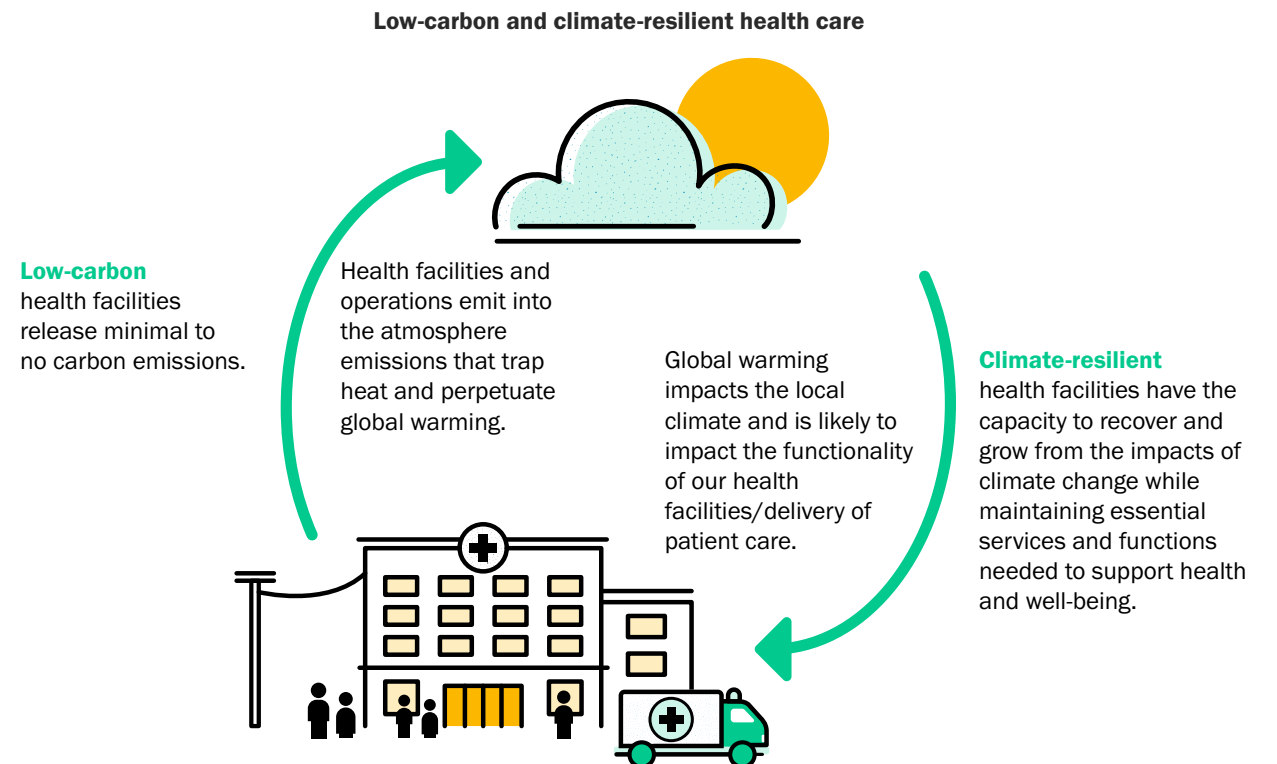
### Our goal

**In partnership with key stakeholders, move toward a climate-resilient health system, manage climate risks to our hospitals and long-term care homes, and break the chain of cascading impacts on the services we provide in our health-care facilities and our broader communities of care.**

Our leadership role in developing fit-for-purpose information, tools and processes to reduce climate risks in planning and design enables our people, services, assets and infrastructure to better manage climate risks over the next 60 to 100 years of operations. By engaging with other leaders in climate risk management, exploring synergies and co-benefits in reducing emissions, and improving human health, our program is on the forefront of developing and translating new knowledge into low-carbon and resilient actions and plans that align with the [CleanBC plan](#) and the [Climate Change Accountability Act](#).

### Our targets (under development)

We are in the process of developing climate risk and resilience metrics and targets for new major capital projects and facility operations, health system climate resilience indicators and a system for tracking progress.





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## Our partners

BC Climate Action Secretariat, Climate Risk  
Management Branch

BC Housing Research Centre, Mobilizing Building  
Adaptation and Resilience project

Health Canada, Climate Change and Innovation Bureau

Health Emergency Management BC

Interior Health

Island Health

Local governments

Ministry of Health, Capital Services Branch and Health  
Protection Branch

Northern Health

Pacific Climate Impacts Consortium

Population & Public Health

Simon Fraser University, Adaptation to Climate Change Team

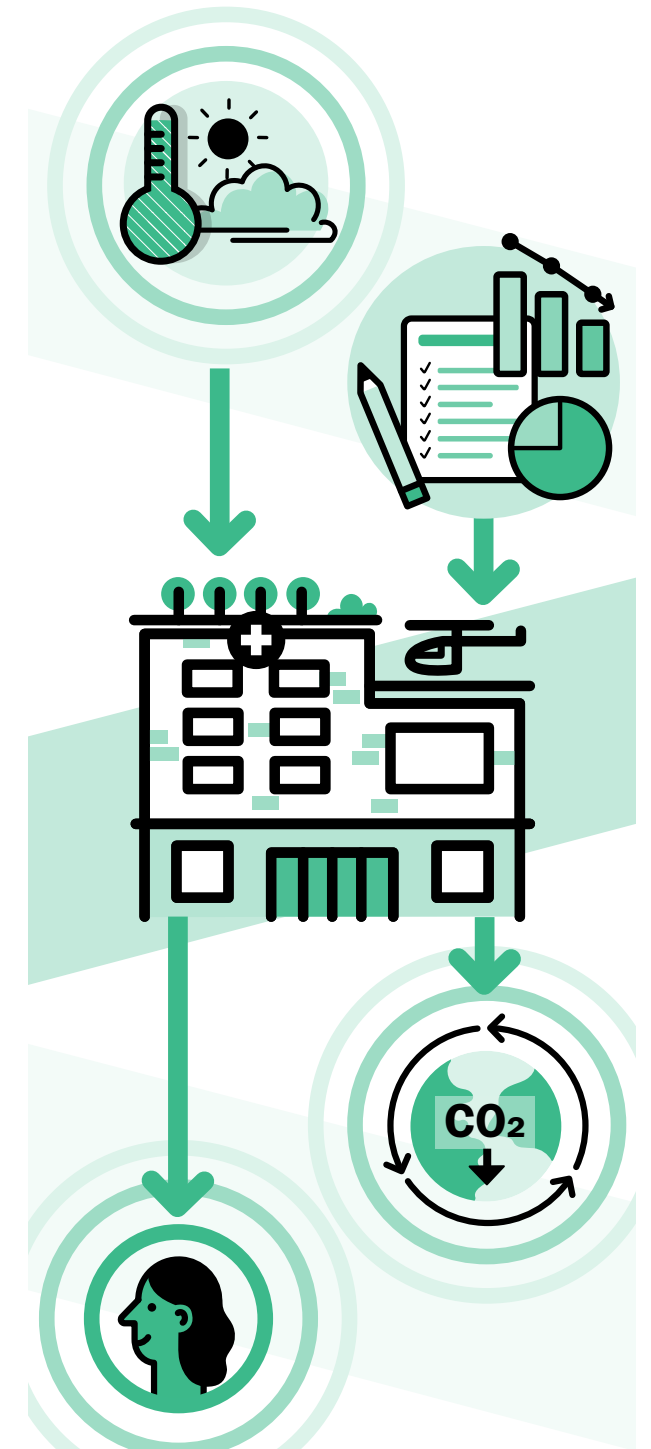
University of British Columbia, Collaborative for Advanced  
Landscape Planning

Various consultants

## OUR STORY

### Incorporating climate resilience into project planning at the new Surrey Hospital & Cancer Centre

A new acute-care facility, the new Surrey Hospital & Cancer Centre, will be built on land across from the Kwantlen Polytechnic University's Cloverdale campus. The project has an emphasis on being a "progressive and future-focused" community hospital that is resilient to major natural hazards, including climate, pandemic and seismic events. Because the project vision included resilience, the project team carried out a Resilience Workshop (including climate, pandemic and seismic resilience), which is equivalent to what is now required in the first two steps of the Climate Risk and Resilience Assessment process – the Exposure Screen and Climate Risk Assessment, as outlined in the Resilience Guidelines. The EES team had strong relationships with both Mary Lynn Nicodemus, director, Capital Land and Development, and Chief Project Officer Ken Mah, which led to climate-resilience objectives being embedded early in the project's concept plan. The Resilience Guidelines were in development at the time of the Resilience Workshop, which helped shape the workshop and the process outlined in the guidelines. Moreover, this project was used as an opportunity to better understand how climate resilience must be incorporated early in the planning process of a new construction project.



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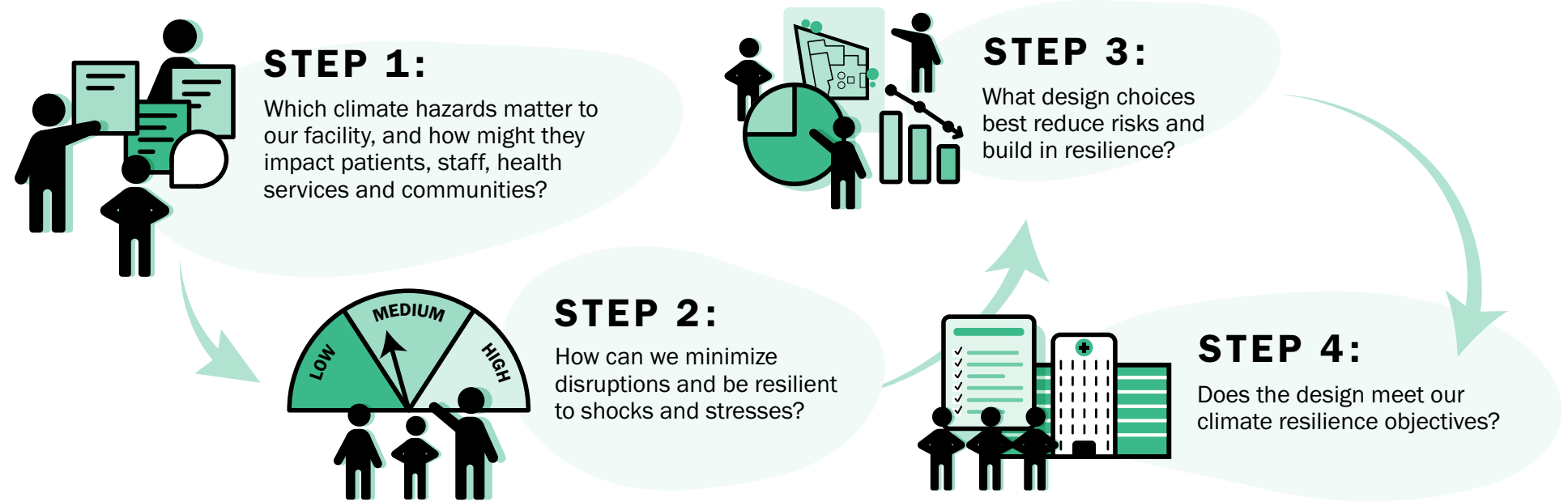
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## OUR STORY

# Collaborative planning for climate-resilient facilities

Climate change hazards that pose significant and growing risks to health facilities are most efficiently addressed at the stage of facility planning and design. Completed in 2020, [Climate Resilience Guidelines for BC Health Facility Planning and Design](#) will assist capital project planners and climate adaptation staff and consultants to improve the resilience of health-care facilities and operations to climate risks. This is the first set of such guidelines in Canada, positioning B.C. health authorities as leaders in climate risk management and resilience planning.

The guidelines apply to all new construction, major redevelopments and major renovation projects that require a business plan and use a design-build model. They help facility designers and operators with common and complex challenges, such as understanding risks associated with compound hazards (e.g. pandemic and seismic), which are identified by a climate risk and resilience assessment process outlined in the guidelines. Through the use of open-access online tools, process descriptions and other

information may be downloaded and customized for various projects and procurement models.

The guidelines also provide examples and checklists that may be customized and incorporated into contract, procurement and evaluation documents for capital projects, and they assist capital project teams in meeting annual reporting and information-sharing requirements.

Project partners worked collaboratively to develop the guidelines, which benefited from an advisory committee of subject-matter experts, a working group of B.C. health authority representatives, and a task force of building design and climate risk management professionals, in addition to the core project team. All regional and provincial health organizations contributed to the guidelines, and 10 consulting firms and one public sector organization (BC Housing) provided significant in-kind contributions.

As the project moved forward, the guidelines gained sufficient credibility and momentum to support the

development of a Carbon Neutral and Climate Resilient Health Care Facilities policy, as part of the Health Capital Policy Manual updated by the BC Ministry of Health in 2021.

“  
**This adaptive approach to climate resilience in our health-care facilities ensures that critical options are not precluded due to lack of foresight. A long-term view to building performance has a long-term impact on health outcomes.**

– Larry Harder, Executive Director, Fraser Health Facilities Management, Projects and Standards



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## OUR STORY

# Mapping vulnerability

Some people and communities are more vulnerable than others to the health impacts of climate hazards. Our exposure to the hazard, sensitivity to it (such as from age or health status) and capacity to adapt affect our degree of vulnerability.

The Community Health and Climate Change Mapping project spatially represents such community health vulnerability. Focused on four climate hazards — heat, wildfire smoke, ground level ozone, and coastal and river flooding — it intends to advance the conversation about climate change and health equity while also providing information for adaptation planning.

“Communities often have limited time and resources. These maps will help them and the health authorities as partners understand where to prioritize investments in building equitable resilience to climate change,” says Dr. Emily Newhouse, Vice-President, Public Health, and Medical Health Officer, Fraser Health.

In particular, local governments, provincial health agencies and Health Emergency Management BC can use the maps to inform environment and climate change strategy.

The project also contributes to related initiatives. In Climate Resilience Guidelines for BC Health Facility Planning and Design, the maps are a component of the high-level master planning process that informs the design of new facilities.

Led by VCH Public Health, the project was supported by staff from Fraser Health, Facilities Management, and Health Emergency Management BC, as well as by UBC, BC Centre for Disease Control, municipal and regional governments, and Licker Geospatial Consulting Co.

“

**Communities often have limited time and resources. These maps will help them and the health authorities as partners understand where to prioritize investments in building equitable resilience to climate change.**

– Dr. Emily Newhouse, Vice-President, Public Health, and Medical Health Officer, Fraser Health

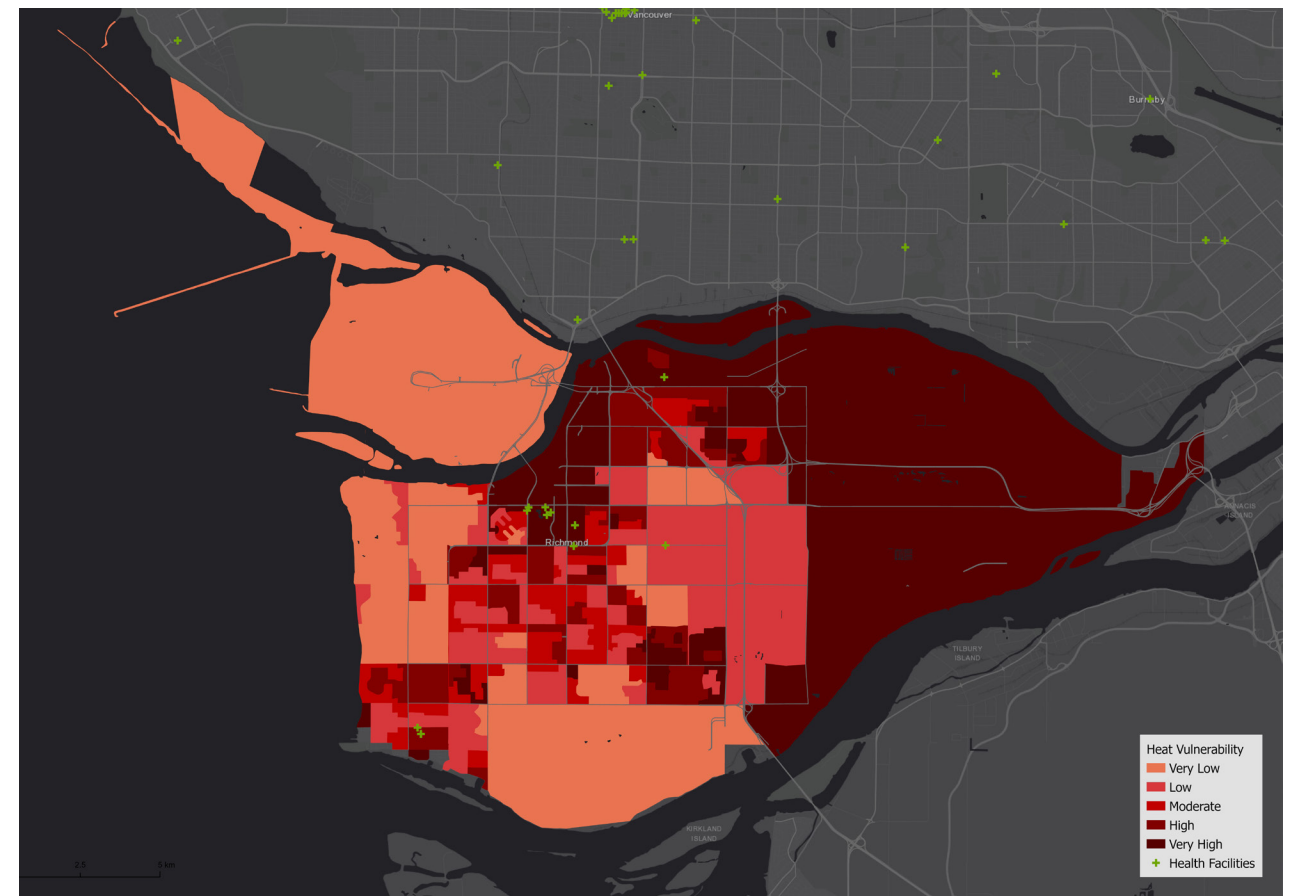


Figure 1. This example community health vulnerability map displays the heat vulnerability index in the city of Richmond. The index comprises heat exposure, population sensitivity to heat and population adaptive capacity.

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## What do Fraser Health staff have to say about the impact of climate change hazards on their work? <sup>E</sup>

**73%** of Fraser Health staff reported that they experienced climate change hazards in the last 12 months. The most common were:

- Wildfire smoke
- Wind storms
- Extreme rainfall and thunderstorms/lightning
- Heat waves

**23%** of Fraser Health staff reported that climate change hazards impacted their ability to perform their job duties in the last 12 months. The most common were:

- Wildfire smoke
- Snow or ice storms



## Our successes

In 2020, we explored successfully the synergies and co-benefits of building climate and pandemic resilience concurrently in the design of the new Surrey Hospital and Cancer Centre. By ensuring that we grounded our climate risk assessment process in the reality of compound hazards; embedded clinical and patient perspectives into a standardized process; and explored the interdependencies among social and physical resilience, we expanded our knowledge base for reducing climate-related risks in complex facilities that support a variety of direct-care services. Because the broader Climate Risk and Resilience Assessment process was integrated early into the capital project timeline, our program was able to establish and build relationships with diverse capital project stakeholders.

## Challenges we face

To work effectively at the scale of our climate challenge and build health system climate resilience, a climate lens needs to be applied to our governance and accountability frameworks. Key health system-level components, including insurance and enterprise risk management, have a critical role to play in the calculus of investing in resilience and minimizing the costs of inaction. Finally, climate risk and resilience reporting that drives action across our regional and provincial health organizations will better align with marked shifts towards increased transparency and accountability as the new normal in due diligence at national and international levels.

“

**Our health-care organization should be highly involved and motivated to reduce greenhouse gas emissions as climate change will have a big impact on health.**

– GreenCare Survey respondent

## The work isn't finished

We will continue to work with Fraser Health leadership and other key health system stakeholders with province-wide mandates, such as HEMBC and the Ministry of Health's Capital Services Branch and Health Protection Branch, to embed climate risk and resilience into strategic and operational priorities. We will also continue to review lessons learned from the whole-system COVID-19 pandemic response, with a view to engaging leadership, leveraging pan-organization coordination mechanisms, and capitalizing on momentum gained for climate preparedness and response.



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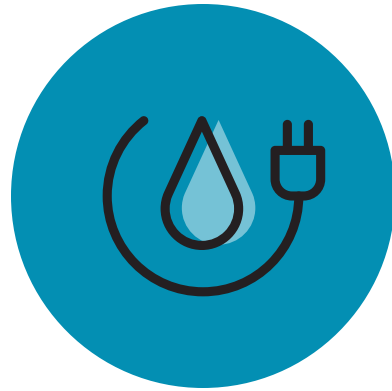
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## 3. Smart Energy & Water

### Our goal

**Minimize energy and water consumption and GHG emissions to reduce costs and environmental impacts, helping to ensure the health and wellness of our living environments.**

Achieving the Smart Energy & Water goals means stewarding energy and water and their utilities. Fraser Health is continually looking for opportunities to reduce the amount and intensity of energy and water use and GHG emissions from health-care operations. Energy efficiency measures and water-conserving infrastructure achieve greater output using fewer resources, thereby lowering our environmental footprint without compromising patient care or employee comfort.

### Our targets

Reduce energy-use intensity of core sites\* by



Reduce absolute in-scope GHG emissions by



Reduce in-scope GHG-emissions intensity by



Reduce building water-utilization intensity of core sites by



\* Core sites are defined as primarily owned health-care facilities that can be actively monitored for energy, water and waste data.

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## Our partners

BC Hydro<sup>F</sup>

BC Emergency Health Services

Climate Action Secretariat

Facilities Maintenance and Operations

Finance

FortisBC<sup>F</sup>

Ministry of Environment and Climate Change Strategy

Ministry of Health Capital Services Branch

Municipal governments

Projects and Planning teams

PHSA Supply Chain

## Current programs include:

- Energy Management
- Carbon Emissions Management
- Water Management





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## ENERGY MANAGEMENT

The Energy Management program seeks to reduce reliance on fossil fuels and overall energy consumption, thereby reducing negative environmental impacts and supporting human health.

The program develops strategic partnerships and strong relationships with a wide range of stakeholders — particularly maintenance and operations teams, project and planning teams, consultants and utility providers — to identify and implement energy conservation opportunities. It also undertakes measurement and reporting on key energy performance indicators and benchmarks, connects with internal sustainability consultants on systemic and behavioural change initiatives, and monitors and tracks project funding.

Some of the initiatives included in the energy reduction strategy are as follows:

- Energy studies to determine project opportunities
- Heating plant upgrades and district energy solutions
- Efficient lighting upgrades
- Control-system optimization
- Cooling plant site strategies
- Heat recovery retrofits and installations
- Behavioural change campaigns for energy conservation

## CARBON EMISSIONS MANAGEMENT

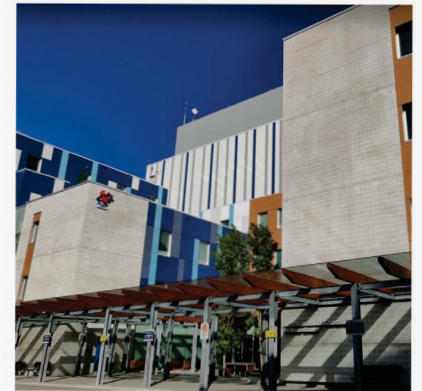
The focus of the Carbon Emissions Management program is to reduce greenhouse gas (GHG) emissions and align with the [Climate Change Accountability Act](#) (CCAA) and the [CleanBC plan](#). The CCAA has set ambitious targets for public sector organizations, requiring a reduction in emissions by 40% by 2030, 60% by 2040, and 80% by 2050. The CleanBC plan is the pathway to achieve these targets and has set an even more aggressive target of 50% by 2030 for public sector buildings. Of the total measured in-scope emissions generated by Fraser Health sites, over 96% are from buildings, while the remaining 4% are from supplies (paper usage) and transportation (fleet and other vehicles) combined. The GreenCare goals and targets for carbon-neutral operations will be achieved, generally, by reducing GHG (carbon) emissions and purchasing carbon offsets.

Some of the initiatives included in the program are as follows:

- Carbon-emission reduction strategies for buildings
- Reduction of operational energy (natural gas and electrical) consumption
- Optimization of existing plants and controls
- Building of new facilities to rigorous energy standards and aggressive carbon targets
- Consideration of asset planning to ensure lower-carbon equipment

It is important to note that energy management and carbon management initiatives work hand in hand through coordinated efforts. They are not siloed programs; activities within each are planned and executed in concert.

### 2020 Public Sector Organization Climate Change Accountability Report Fraser Health Authority



## The Fraser Health Climate Change Accountability Report

Each year, along with all public-sector organizations, B.C.'s health authorities submit a Climate Change Accountability Report (CCAR) (formerly Carbon Neutral Action Report (CNAR)) to the Climate Action Secretariat of the provincial government. This is a mandated reporting of GHG emissions and other data, and current and planned actions to reduce GHG emissions.

In 2020, and including prior year adjustment, Fraser Health had a carbon footprint offset of 39,861 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e), which was offset at a total cost of \$998,800. This represents a 19% decrease in emissions per floor area relative to the carbon footprint base reporting year, 2007.

Download: [Fraser Health 2020 CCAR](#)

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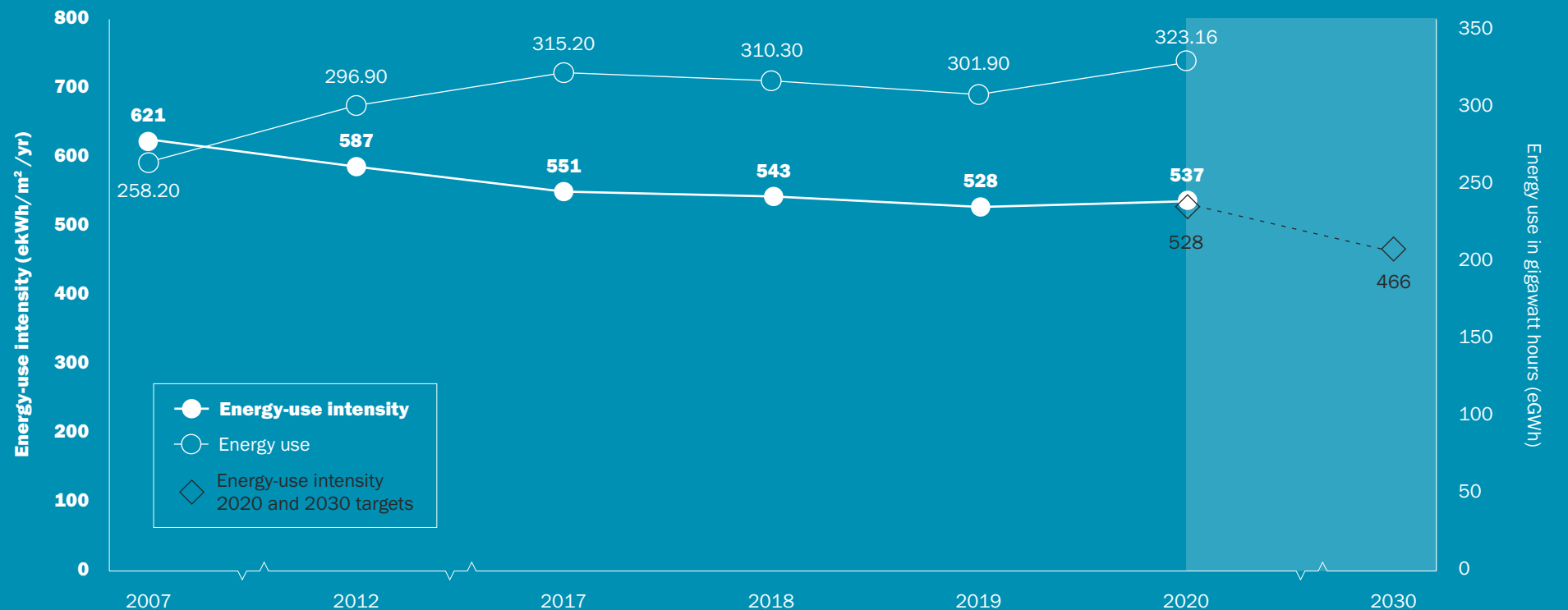
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# Energy Use and Intensity

Energy use at core health-care sites\* is measured in equivalent gigawatt hours (eGWh) and captures the entire amount of energy used from all energy sources\*\* on an annual basis. Energy-use intensity (EUI) is measured in equivalent kilowatt hours generated per square metre of facility space (ekWh/m<sup>2</sup>/yr). This graph is a key benchmark for progress of energy consumption since it tells us that even as we grow in facility space,\*\*\* we are reducing our energy use per building area. Since 2019, there has been a 1.7% increase in EUI for core sites. This is primarily due to operational changes during the pandemic, where most sites started using 100% outdoor air for ventilation (as opposed to a mix of return air and outdoor air).

13.5%↓

EUI has decreased by 13.5% since 2007, and, despite an increase of 45% in core-facility space since 2007, our energy use only increased by 25%.



\* Core sites are defined as primarily health-care facilities that can be actively monitored for energy, water and waste data.

\*\* This includes electricity, natural gas and fuel oil, and energy purchased from district energy systems.

\*\*\* Changes to facility area through new construction and demolitions directly impact these figures.



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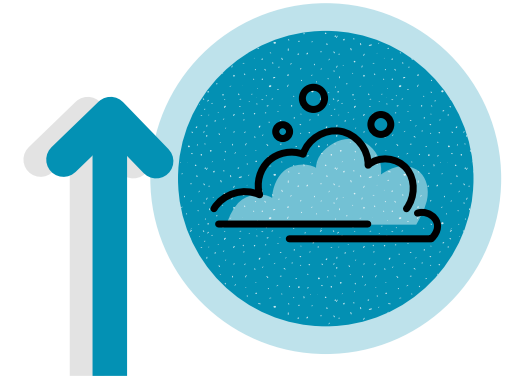
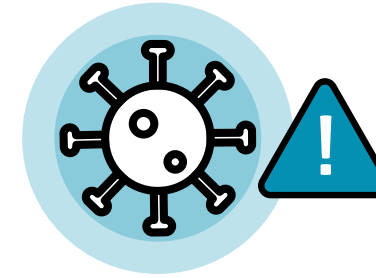
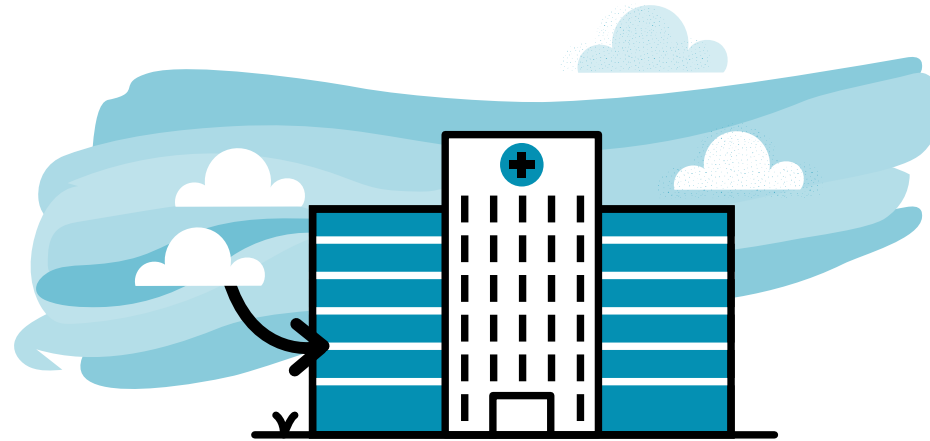
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## OUR STORY

# Learning from energy and emission impact due to the pandemic response

Despite Fraser Health's continuing effort to reduce carbon emissions, we increased our carbon emissions by 2,372 tonnes CO<sub>2</sub>e in 2020, or 6.3% compared to 2019. We did not have a cold winter, so what was the cause of this increase?

In large part, it was caused by the pandemic and a safety-related decision to increase the amount of outside air in ventilation systems. Early in the pandemic, Fraser Health leadership asked hospitals and long-term care facilities to "go to 100% outside air" — opening intakes for ventilation fans to 100% and closing off the recirculation of air.

In normal times, Fraser Health indoor environments are carefully controlled to mitigate against transmission of pathogens. Each area of the hospital, from waiting areas to operating theatres, must meet specific Canadian Standards Association code requirements for the amount of air circulation and the proportion of outside, "fresh" air.

The initial request was made in March 2020 out of an abundance of caution to lower the risk of indoor transmission of the COVID-19 virus. Guidance from

the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) later confirmed this approach, in response to available research on COVID-19 transmission<sup>6</sup>. However, ASHRAE cautioned that maintaining an appropriate thermal and humidity range for patient health is also important in preventing viral transmission.

For Fraser Health, it was a learning process as to equipment limitations and trade-offs. All sites have different designs and age of equipment, and some older hospitals are not able to provide 100% outside air during the hottest and coldest periods of the year, while also maintaining indoor thermal comfort.

In 2020, Fraser Health's core facilities energy-use intensity (EUI) was targeted to reach 15% below the 2007 baseline. Due to the pandemic, this target was missed by 1.5%. The impact of moving to 100% outside air increased Fraser Health energy costs by approximately \$550,000 and carbon emissions by 8%. (Actual emissions increased 6.3%, which takes into account a milder winter, increasing efficiencies and an overall increase in Fraser Health occupied spaces.)

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## OUR STORY

# Isolation room ventilation key to COVID-19 safety

Surrey Memorial Hospital's Critical Care Tower (CCT) was designed to respond to a pandemic. Opened in 2014, it features 138 patient rooms grouped into 16 pods, with the ability to "double-up" some rooms for extra capacity, and the rooms can be easily converted into what are known as "isolation pods," via a few changes to the ventilation controls. All pods have been in isolation mode during the third wave of the pandemic in spring of 2021, with four pods in isolation mode since the second wave in the fall of 2020.

Ventilation control has been only one part of a much larger effort to contain COVID-19 transmission within Fraser Health facilities, but it is especially key to the creation of isolation rooms for infectious patients. Each isolation room requires increased ventilation and a degree of depressurization to direct a flow of air across the patient towards the exhaust. As a strategy to reduce virus transmission, this directional airflow is more important than increasing the air change rate, according to ASHRAE.<sup>6</sup>

The CCT has a very busy Emergency Department that often reaches levels of 500 patients per day. Despite providing care for approximately 75% of COVID-19 patients within Fraser Health, the level of COVID-19 transmission among staff or patients at the CCT was minimal, which is considered a great achievement.



Surrey Memorial Hospital's Critical Care Tower



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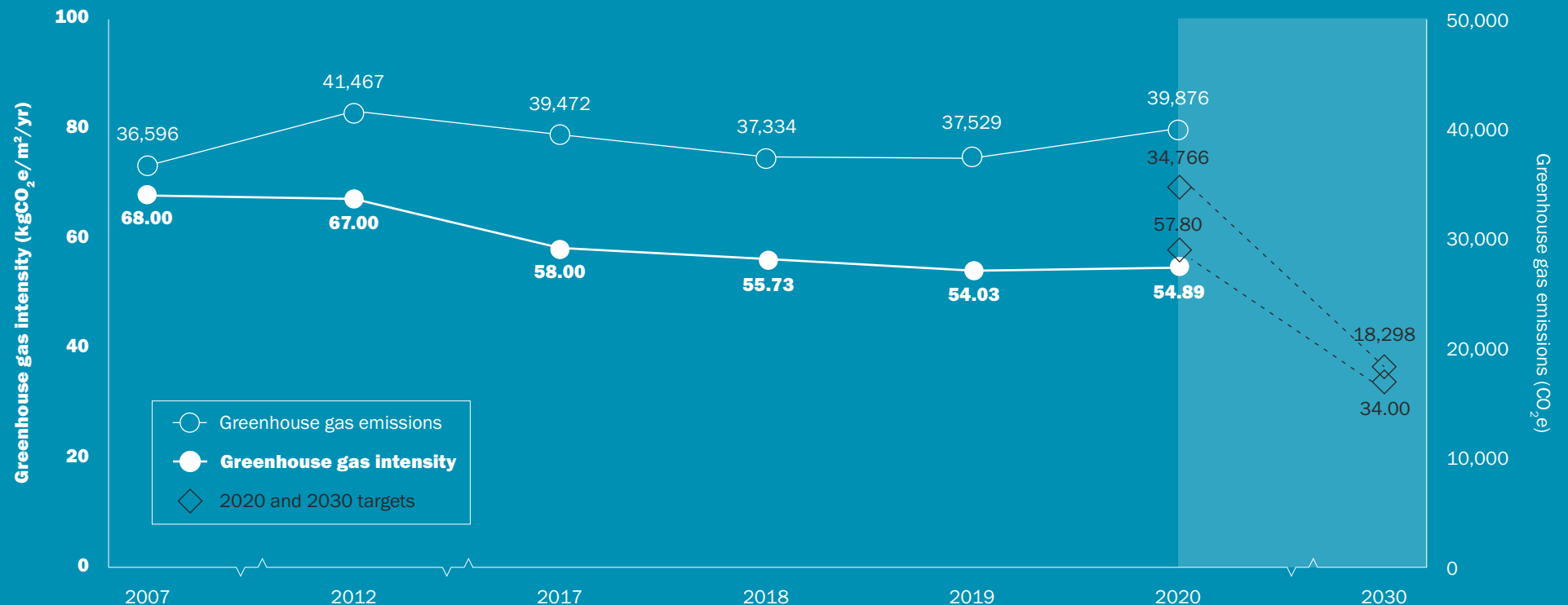
# Greenhouse Gas Emissions and Intensity

Absolute emissions,\* measured in tonnes of CO<sub>2</sub>e annually, represent the total reported, in-scope emissions (energy consumption, fleet use and office paper) for all owned and leased buildings. Intensity is measured in kilograms of carbon dioxide equivalent emitted per square metre of usable facility space per year (kgCO<sub>2</sub>e/m<sup>2</sup>/yr); this represents the emission intensity average across all owned and leased sites. Each building has a very different emission profile depending on the main fuel sources, energy infrastructure age, facility condition and clinical programs served. The emission intensity

will continue to improve as we replace old emission-intensive facilities with new, low-carbon facilities and carry out work to replace infrastructure in existing buildings with low-carbon solutions. Note that percentage differences for EUI and GHG emissions do not coincide due to factors such as weather adjustments in EUI data and different emission factors for energy sources. Since 2019, a 6.3% increase in GHG emissions was mainly driven by ventilation changes due to the pandemic.

19.3%↓

GHG intensity has decreased by 19.3%, and, despite a 35% increase in total usable facility space since 2007, absolute emissions have only increased by 9%.



\* Absolute emissions refers to total emissions regardless of growth change and weather variation. In-scope emissions are from owned and leased buildings, fleet travel and paper use (as defined by the *Climate Change Accountability Act*).

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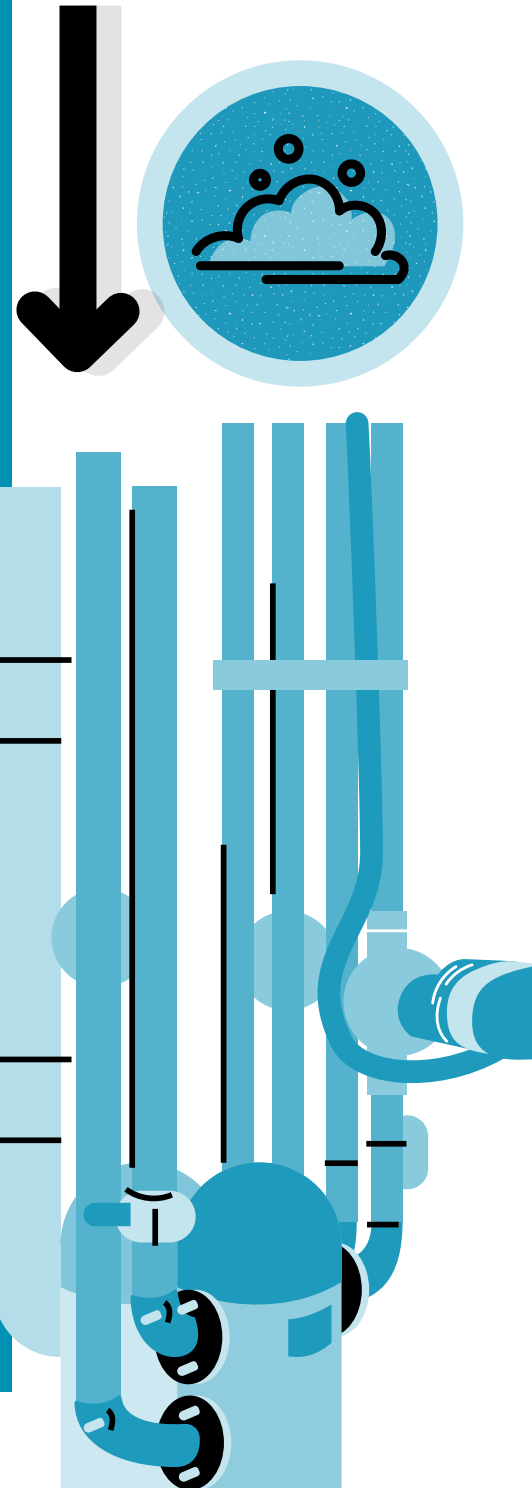
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### Future priorities for HVAC design

Fraser Health's capital planning team, in collaboration with the EES team and other partners and environmental sustainability teams, is revising design guidelines for future hospitals that will help meet B.C.'s aggressive targets for carbon reduction and increased resilience to climate-related stress and future pandemics, while maintaining services to meet the population's health-care needs.

If the call for 100% outdoor air in facilities continues, methods of avoiding an increase in carbon emissions due to the thermal heating load should be considered. Fraser Health energy retrofits, such as the Active Heat Recovery project currently underway at the Heritage Village long-term care facility, can be designed with energy efficiency in mind while still using 100% fresh air.

New construction, hospital expansion projects and major renovations of aging equipment provide critical opportunities to introduce newer technologies and improved design for efficiency and resiliency. This direction is reflected in the Carbon Neutral & Climate Resilient Health Care Facilities report, part of the government's new Health Capital Policy Manual released in March 2021.



## WATER MANAGEMENT

In our climate reality, the management of water use is a growing priority not only for health-care organizations but for all B.C. residents. Fraser Health's Water Management program is an integral part of the Province's strategy to address the recurring issue of water shortage across B.C.

The Water Management program seeks to actively plan, develop, distribute and optimize the use and possible reuse of water resources by health-care sites. Much work is done in collaboration with the Fraser Health Operations and Infrastructure teams and focuses largely on conservation programs to:

- Optimize landscape irrigation.
- Eliminate once-through cooling mechanical systems.
- Capture/reuse rainwater.
- Optimize water use through behavioural change.
- Manage sewage and wastewater, with the eventual goal of recycling or reusing grey water where applicable.
- Investigate and promote use of low-flow devices, where applicable.





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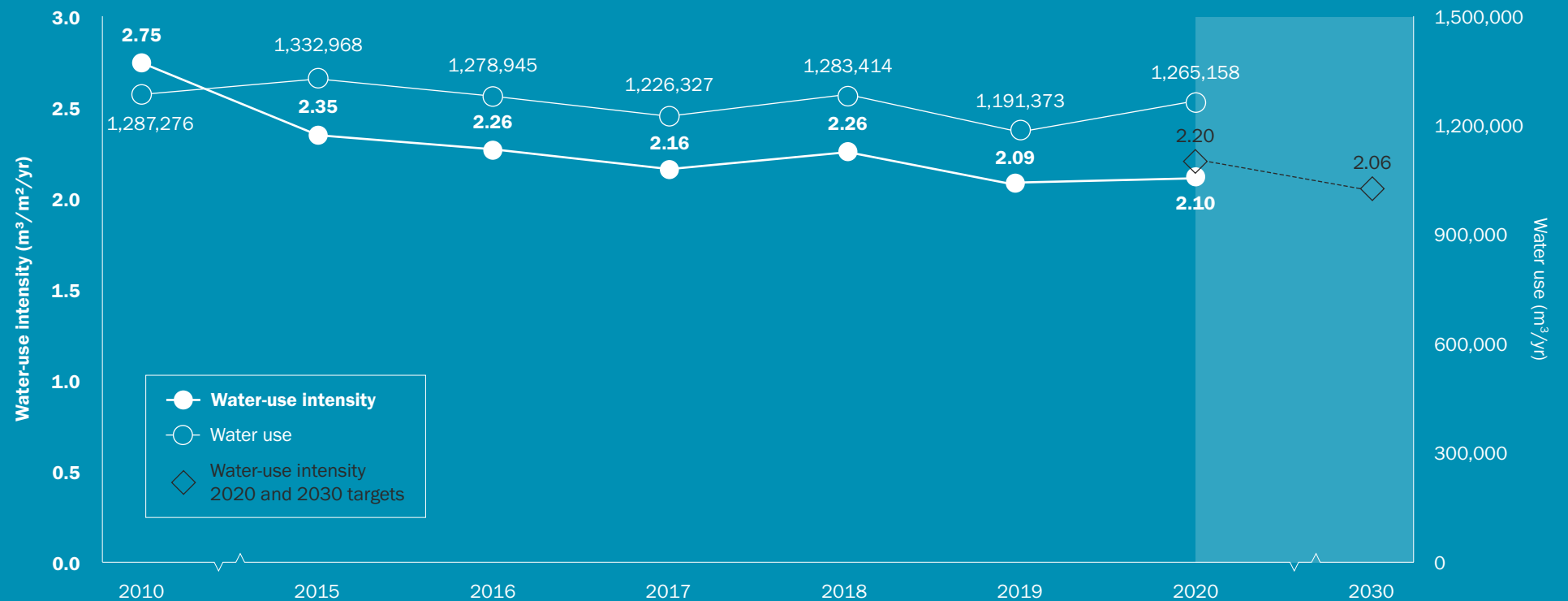
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# Water Use and Intensity

Water use at core sites\* is measured in cubic metres per year ( $\text{m}^3/\text{year}$ ). Total water-use intensity at core sites is measured in cubic metres per square metre of facility space per year ( $\text{m}^3/\text{m}^2/\text{yr}$ ). Water use depends on operational needs, process needs and clinical equipment changes. One-third of the increase in water consumption in 2020 is due to operation of the new Mental Health and Substance Use Wellness Centre on the Royal Columbian Hospital campus. Increases at Burnaby Hospital and other sites are currently under investigation.

# 23.5%↓

Water-use intensity has decreased by 23.5%, and, since 2010, despite an increase of 28.4% in core facility space, absolute water use has decreased by 1.7% (equivalent to nearly nine Olympic-size swimming pools).



\* Core sites are defined as primarily owned health-care facilities that can be actively monitored for energy, water and waste data.

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## Our successes

In fiscal year 2020-2021, energy- and emissions-reduction projects and climate-resilience and adaptation-strategy work are projected to reduce electricity consumption by over 786,860 kilowatt-hours (the equivalent of the annual electricity consumption of 30 CT scanners) and natural-gas consumption by 27,482 gigajoules (the equivalent of annual natural-gas consumption of 370 homes), reducing our carbon footprint in future years by the equivalent of 1,239 tonnes of CO<sub>2</sub> independent of weather, operational and space changes. Measures such as optimization of heat-recovery chiller systems, adding heat pumps to reuse waste heat, upgrading to high-efficiency heating and cooling systems, initiating an EV charger-demand control system, and the EES team’s increased role in new construction projects are enhancing environmental sustainability in Fraser Health facilities.

Collaboration within the Facilities Management department emphasized the energy efficiency and emission element of the primary equipment replacement projects and also optimized the resources needed for these projects. An example of this coordination at work was the decision by FM, with EES team support, to create two new staff positions (in progress) to increase internal expertise and capacity for maintenance of automated control systems. Further, in working together, collaboration between the EES team and capital planning teams contributed to a high-efficiency, low-emissions design for the new Surrey Hospital & Cancer Centre. As the EES team’s participation in the Key Strategic Projects substantially increased, new resources were added to the EES team in 2020 and 2021.

## Challenges we face

In order to build on our successes, a number of challenges must be addressed. In 2020, specific challenges resulting from the pandemic caused supply chain delays in delivery of equipment, especially lighting, and restrictions to contractor availability. While these caused delays, a major impact on carbon emissions due to COVID-19 was the need to increase outside air ventilation rates in hospitals and long-term care facilities. However, this also revealed opportunities for advanced active heat recovery and operational optimization

at some sites. Considering that our greenhouse gas emissions have increased by 9% in absolute terms, this will require a radical, cross-departmental shift in strategy to meet CleanBC’s ambitious target of 40% emissions reduction by 2030 (from 2007 levels), given that our portfolio will continue to grow.

Integration is key, and an area to continue focusing on. This could be improved through more coordination between the EES team and the Facilities Maintenance (FM) teams, and by working with capital planning teams to better integrate energy, emission and water management strategies, infrastructure, and equipment into funding requests.

By expanding communications with and engagement of diverse stakeholders, including executive sponsorship, we will be better positioned to meet the aggressive emissions targets set by the [CleanBC plan](#).

## The work isn’t finished

We know that actions speak louder than words, so we’re working on the following to advance environmental sustainability at Fraser Health. Measures such as active heat recovery systems, electrification of select domestic hot water systems, and continued evaluation and introduction of more efficient technologies to upgrade controls for monitoring and trouble-shooting issues are some of the measures planned to further reduce carbon emissions.

“
   
**I believe we will eventually realize [that health care and the environment] are intrinsically linked ... planetary health systems are the foundation for human (and all other life) health systems.**

– 2021 GreenCare Survey respondent



Jim Pattison Outpatient Care and Surgery Centre



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## 4. Workplace Leadership

### Our goal

**Together, reach, engage and inspire health-care staff to be leaders who share a commitment to and passion for healthy, sustainable and thriving communities, workplaces and environments.**

In the workplace, leaders who lead by example and inspire others to do the same are critical to an organization’s success. Fostering a culture of workplace leadership for environmental sustainability in health care presents an opportunity for better health outcomes for staff and patients. In addition, supporting and bringing leaders together — whether they are direct-care staff, corporate team members and/or executives — contributes to a more engaged and motivated workplace where values are shared and appreciated.

The Workplace Leadership Focus Area includes [GreenCare](#) and the [Green+Leaders program](#) activities. A network founded by the Energy and Environmental Sustainability (EES) team, GreenCare unites efforts across the B.C. health-care community to transform our health-care system toward environmentally sustainable and resilient care for healthy people, place and planet. GreenCare helps to bring together leaders — whether they are direct-care staff, corporate team members and/or executives — and supports them in creating a more engaged and motivated workplace where values are shared and appreciated. The GreenCare website acts as a home and resource to support these efforts, and, in collaboration with various partners, the EES team is currently in the process of refreshing the website, which should be relaunched in fall 2021.

The [Green+Leaders](#) program, a network of health-care staff who participate in projects and initiatives to advance sustainability across Fraser Health, is a key part of environmental sustainability leadership and innovation.

### Our targets

**Increase the number of Green+Leaders across the organization annually by\***



\* In previous years, this target was measured as a proportional increase in Green+Leaders. It was decided that using numbers will provide more accurate and meaningful information for monitoring. A refresh of the engagement targets and metrics will take place in 2021.

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## Our partners

BC Hydro

Clinical and non-clinical direct-care staff

Communications

Human Resources

Virtual Health

## 2020 Green+Leaders

In 2020, **seven** new staff registered for the program, bringing the total number of Green+Leaders at Fraser Health to **170** since 2010. Fraser Health has **63** active Green+Leaders. The number of Green+Leaders trained throughout the year refers to those staff who have received online training to support their journey as a Green+Leader and is measured as a year-on-year proportional increase. This training isn't mandatory but is strongly recommended as a starting point to joining the program and having the knowledge and tools to implement initiatives that reduce the environmental impact of the workplace.

## Current programs include:

### GREEN+LEADERS

The Green+Leaders program provides direct engagement and support for health-care staff in their efforts to create environmentally sustainable workplaces.

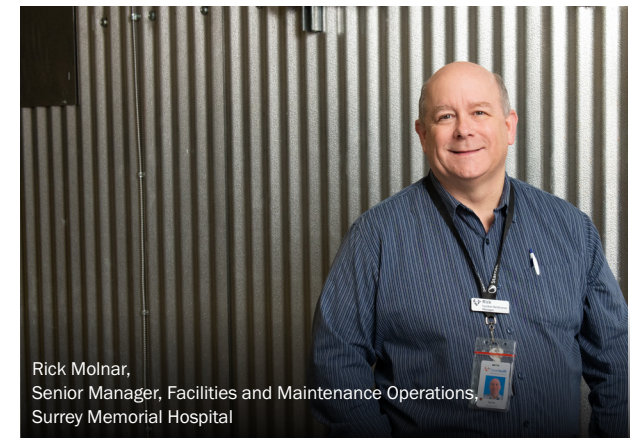
Green+Leaders make a significant contribution to the improvement of the environmental performance of the Lower Mainland health organizations, with more than 500 trained staff volunteers (working in all areas of health care) now participating in the Green+Leaders program. These individuals are agents of change, encouraging environmentally sustainable behaviour, improving existing processes, and helping to create an overall culture of environmental health and wellness inside and outside the workplace.

The program focuses on behaviour change in the following areas:

- Energy & Carbon Emissions
- Water
- Materials, Waste & Toxicity
- Transportation
- Climate Risk & Resilience

It also supports Workplace Leadership efforts while providing the following benefits to staff volunteers:

- Training, tools and leadership development
- Support from a community of like-minded colleagues
- Participation in inspiring and educational events
- Opportunities for making a positive, meaningful impact on the workplace and community





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## OUR STORY

# Less waste, more time for patient care

For Amy Setterstrom, the environment includes the spaces in which she works, and those spaces provide an opportunity for us all to be better stewards of both patient care and the Earth.

Amy is a registered nurse at Delta Hospital and coordinator of the Releasing Time to Care program, which enables staff to pursue solutions that increase the time available for direct patient care. She saw the waste that was created by the need to don new personal protective equipment (PPE) each time a nurse left a patient's bedside to retrieve supplies, and the unused supplies that littered the bedside. Her solution? A bedside supply cart.

The EES team worked with Amy to provide funding for a pilot project that tested the supply cart idea. The enclosed bedside cart contains the most frequently used items needed for patient care and protects these supplies from contamination. This prevents waste as well as the potential transfer of infection from patient to patient. "Having these items close at hand aids the nurse in providing higher-quality patient care," Amy explains. "It reduces the use of PPE and reduces the time to get supplies in order to provide care to the patient."

The collaboration Amy has experienced with the EES team motivated her to persevere with the project through challenging periods. "They have continually encouraged me to keep moving forward," Amy says, and she is continuing to collect data on the project. "I feel empowered to make change and raise awareness to the possibilities of change."



**Amy Setterstrom**

Registered Nurse, Emergency Department,  
Delta Hospital

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## Our successes

In 2020, we strengthened online engagement opportunities for Green+Leaders. This included initiating the Green+Leaders Coffee Conversations (monthly networking socials) to create a space for Green+Leaders to gather and share ideas with one another. We continue to support staff-engagement opportunities through the Green+Leader Dialogue Series (monthly webinars on sustainability topics) and quarterly e-newsletters. This year, we hosted two Lunch and Learns, two Dialogue Webinars, two training and orientation sessions, and one annual recognition event. Highlights include the new Healthy and Green Buildings webinar series that supports the understanding of green design and fosters opportunities for Fraser Health staff to get involved in design and construction processes in health care.

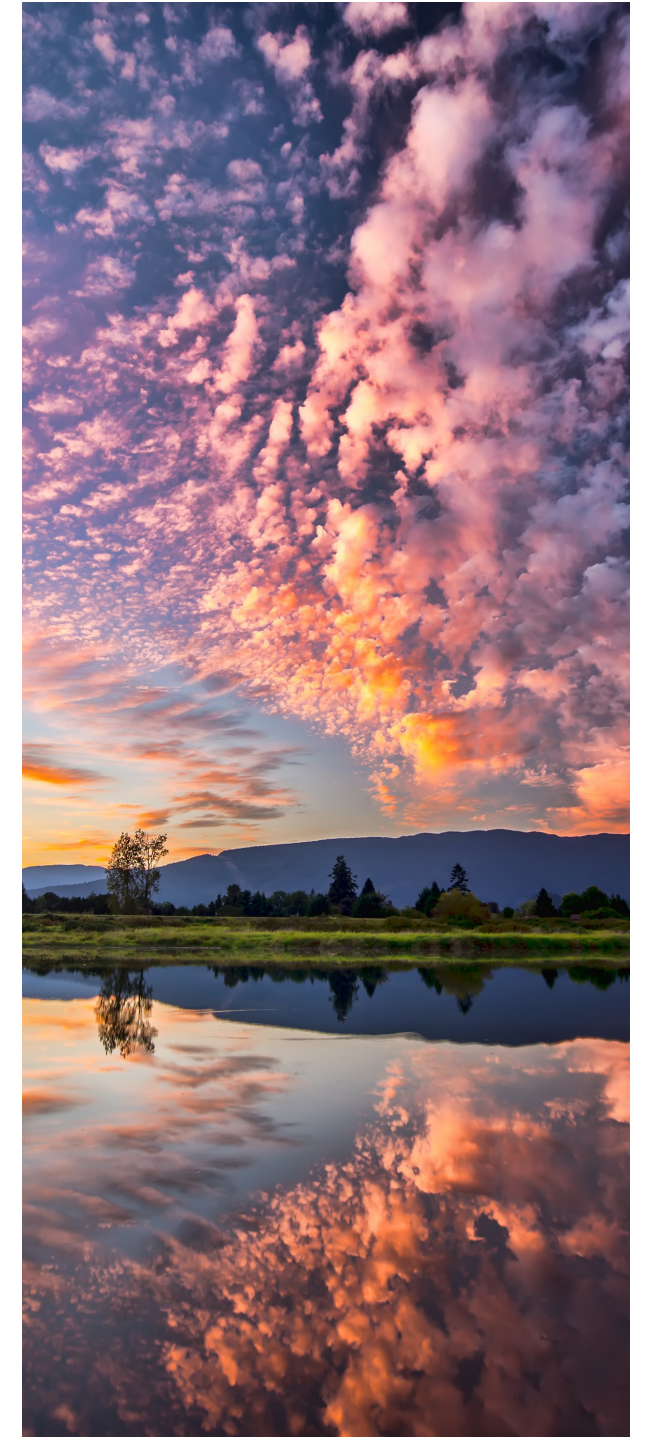
With the support of the Exnovation, one project (\$1,000 awarded) was initiated and developed to create innovative projects in the workplace to improve environmental sustainability in health care at Fraser Health. We are pleased that seven employees across operational, clinical and administrative units have joined the program, bringing together an array of different departments, such as Acute Care, Newton Primary Care Network, and Population and Public Health.

## Challenges we face

As we continue to support sustainability leadership, some of the challenges include finding inspiring, effective ways to engage staff around sustainability and provide meaningful opportunities for staff to connect with each other on sustainability matters in their workplace. In 2020, due to COVID-19, our work transitioned online to webinar-based workshops, orientations and networking opportunities. This allowed Green+Leaders from across the province to more easily join engagement events and learning sessions, and we will continue to look for ways to make our engagement efforts more accessible.

## The work isn't finished

As we work towards ensuring the best support possible for Fraser Health staff, we'll continue to engage and support leadership as it addresses environmental sustainability, refresh the GreenCare website, celebrate staff, and seek out professional development opportunities for Green+Leaders. We are currently working with a UBC sustainability scholar to analyze current targets, metrics and reporting, in order to improve engagement targets and metrics for the Green+Leader program, through best practice research.





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## 5. Zero Waste & Toxicity

### Our goal

**Minimize waste generated and toxic chemicals used by the health-care system and supporting operations.**

In health-care settings, reducing waste and exposure to toxins produces better health outcomes for staff and patients, decreasing the risk of disease.

In the broader environment, scaling down the use of toxic chemicals and waste decreases GHG emissions and negative impacts on water, soil and air, thereby reducing associated health impacts such as respiratory and cardiovascular disease, cancer, endocrine disruption and birth defects.

Fraser Health is working to reduce the negative environmental and health impacts of waste and toxins by focusing on programs that reduce and avoid generation of material waste, divert material waste to recycling streams and reuse programs, and reduce and monitor the use of toxic chemicals in health-care construction, furnishings, maintenance, cleaning and patient care.

### Our targets

**Increase and maintain waste-diversion rates\* at existing acute and long-term care sites to**



**Decrease waste-intensity rates at existing acute and long-term care sites to**



\* Waste-diversion rates show a slow increase over time; however, as is the case for other sites in the Lower Mainland, they seem to plateau at approximately 40%. In order to reach the 2020 target of 50% waste diversion, more aggressive action needs to

be taken to reduce garbage waste and look for new streams of recycling. Until we better understand what actions are feasible, we will maintain the target in 2030.

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## Our partners

Business Initiatives Support Services  
(including the Sustainable Food Operations Committee)

Environmental Vendor Services

Facilities Maintenance and Operations

Infection Prevention and Control (IPAC)

PHSA Supply Chain

Projects and Planning teams

Provincial Nursing Skin and Wound Committee (PNSWC)

Quality Improvement

Workplace Health and Safety

## Current programs include:

- Blue Bin
- Waste Reduction
- Environmentally Preferable Purchasing (EPP)
- Safer Chemicals<sup>H</sup>

## BLUE BIN

The Blue Bin program, administered in partnership with Business Initiatives & Support Services, aims to increase material waste diversion at all owned hospital and long-term care sites, with the target of reaching 50% waste diversion by 2020. The program provides health-care sites with recycling equipment and signage and staff education. As a standardized recycling program, it operates in the same way at every site, making it easier for staff, physicians, patients, volunteers and visitors to compost and recycle correctly. Clear signage attached to each bin helps to reduce confusion and error at the time of disposal.

Recycling is undertaken in both (appropriate) clinical and non-clinical areas of Lower Mainland sites for the following material waste streams:

- Mixed containers
- Mixed paper
- Organics



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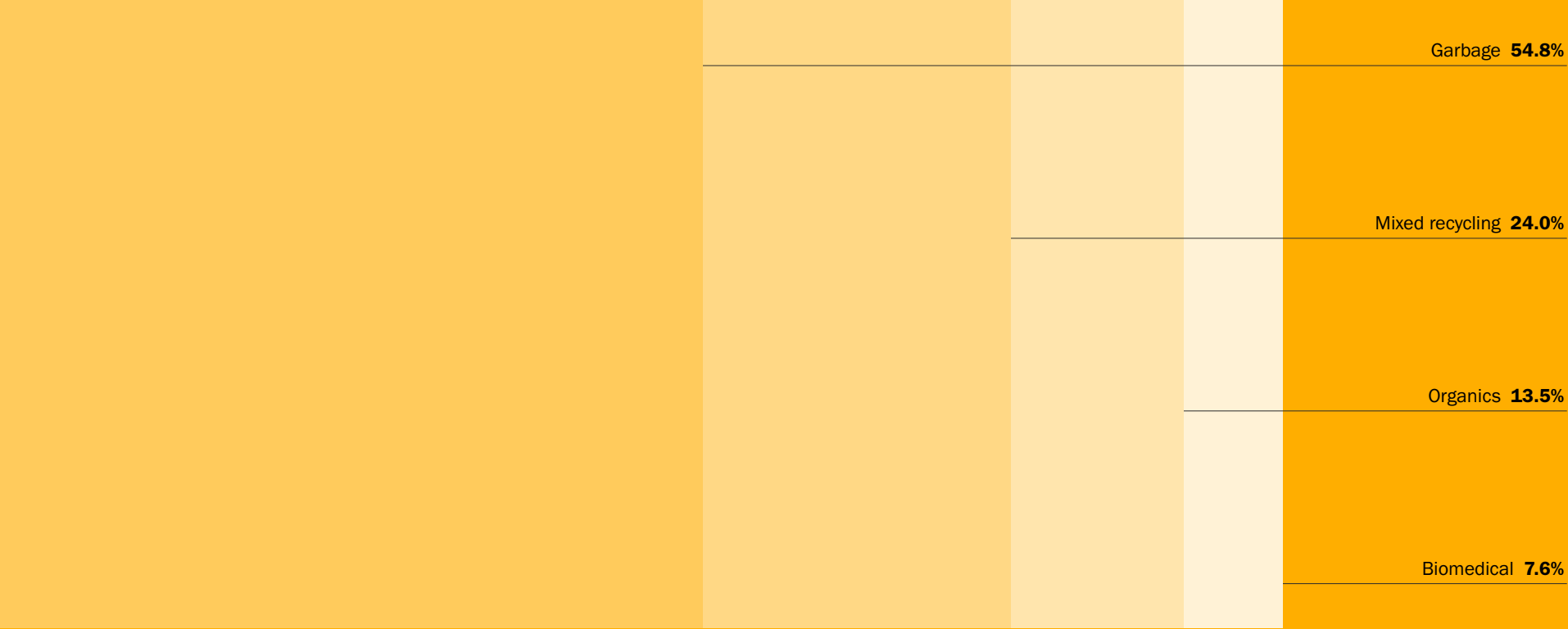
2020 EPAR Dashboard

# Fraser Health Waste Proportions

Waste proportions show most health-care waste is non-hazardous. The majority of waste produced in health care is general, non-hazardous waste that doesn't need any special treatment. This data includes all acute and residential care facilities owned by Fraser Health.

10,076 t

Fraser Health facilities generated a total of 10,076 tonnes of waste in 2020, which is the equivalent of approximately 2,015 five-tonne elephants.





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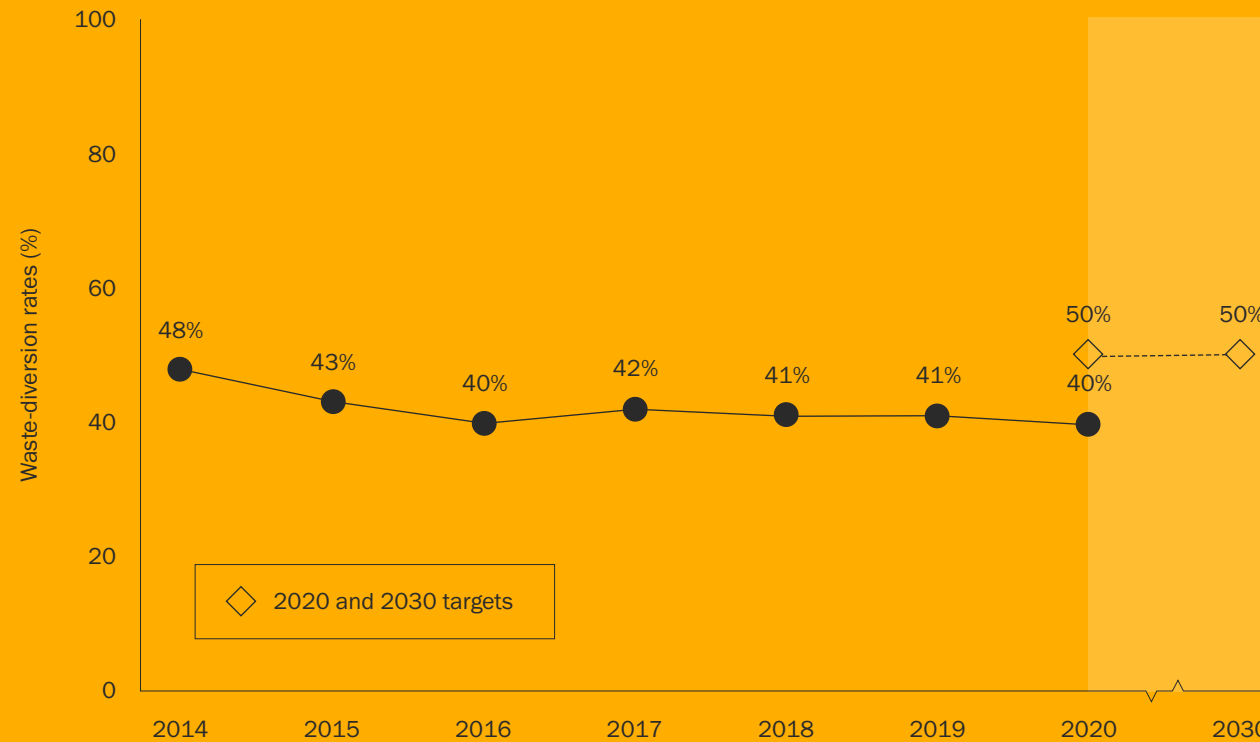
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# Waste-Diversion Rates

Waste-diversion rates are for all owned Fraser Health acute and residential care facilities and do not include biomedical waste. The waste-diversion rate is calculated by dividing total estimated weights for paper, container and organics recycling by the total estimated weight of general garbage waste and recyclables. The decrease from 2014 to 2015 is attributed to the cancellation of the Soft Plastics Recycling program, as well as a change in waste vendors and the methodology used to track data.



“  
**COVID protocols have increased our use of single-use disposable items, which feels so counteractive to the GreenCare needs/climate change response.**

– 2021 GreenCare Survey respondent

In 2020, our waste diversion reflects only waste segregation, as our recycling provider paused the collection of recycling due to concerns for staff safety during the COVID-19 pandemic. All recycling and general garbage streams were instead taken to a local waste-to-energy facility.

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## OUR STORY

# Taking care of people and the planet

Victoria Alcuaz is focused on sustaining life — in the hospital and on Earth.

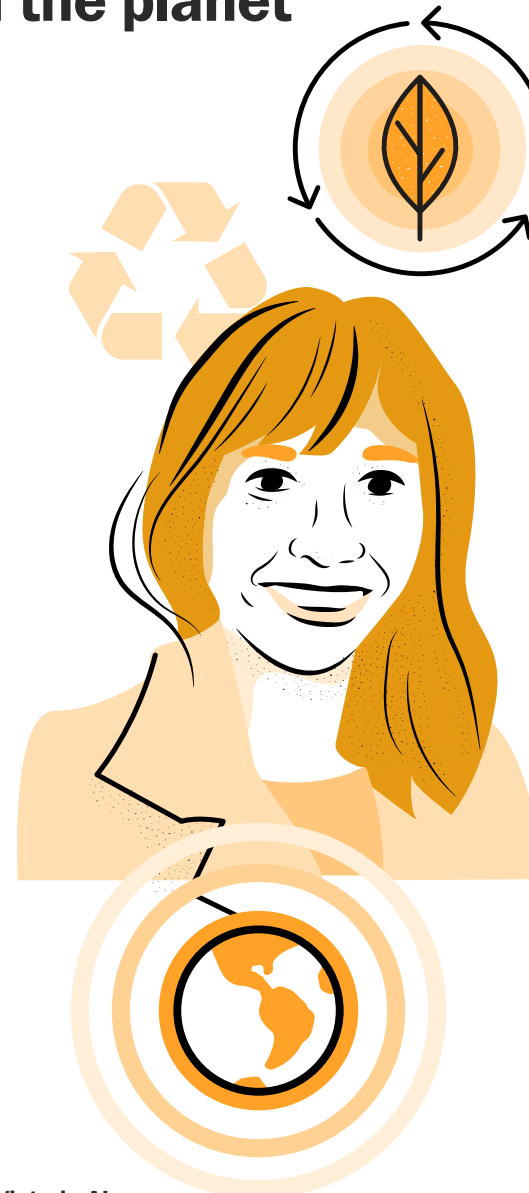
As a clinical nurse educator who works in acute care, Victoria's primary concern during the COVID-19 pandemic was to sustain human life at all costs. She held onto the importance of environmentally sustainable and resilient health care even during this time because, as she says, "we live on only one Earth, and to prevent illness and sustain life we have to do everything we can to safeguard and protect it, not only for ourselves but for generations to come."

In the narrow window between the first and second waves of the pandemic, Victoria worked with the EES team to organize interactive workshops with staff about addressing waste through prevention, reduction, reuse and repurposing. The intent was to empower her colleagues to help the planet as they go about their work saving lives.

Contributing to workplace environmental initiatives with the EES team has had an impact on Victoria's work as a clinical nurse educator. "It has reinforced universal truths of us being stewards of each other and the Earth we all live on," she says. "To effect any sustainable change, a culture shift is necessary, and we have taken the first crucial step."

Outside of work, Victoria fundraises for local and international causes, such as the Tour de Cure for BC Cancer Research, which she has participated in for the last five years.

Stewardship is at the heart of her beliefs, whether taking care of people or the planet. Victoria believes that "we are all interconnected, and what we do and bring to the world comes back to us in more ways than one."



### Victoria Alcuaz

Clinical Nurse Specialist for the Frail Elderly-Older Adult Network at Jim Pattison Outpatient Care and Surgery Centre and Surrey Memorial Hospital

## ENVIRONMENTALLY PREFERABLE PURCHASING (EPP)

Purchasing items that generate unnecessary packaging, contain toxic chemicals, and must be disposed of in the garbage or hazardous waste (not recyclable) contributes to the extraction of unnecessary natural resources, GHG emissions and air pollution, which are associated with health problems such as asthma, endocrine disruption and mental illness. The EPP program aims to decrease the negative impact of building materials and patient-care equipment and supplies on environmental and human health.

The program includes the following actions to support the achievement of environmental sustainability goals and targets:

- Collaboration with clinicians and key departments, such as PHSA Supply Chain (which procures goods and services for all B.C. health authorities), Infection Prevention and Control, Workplace Health & Safety, and Facilities Maintenance, in order to signal to health-care vendors the importance of environmental and human health
- Making changes to our procurement processes; in 2020, a weighted environmental questionnaire was included in the request for proposals for waste-management services.



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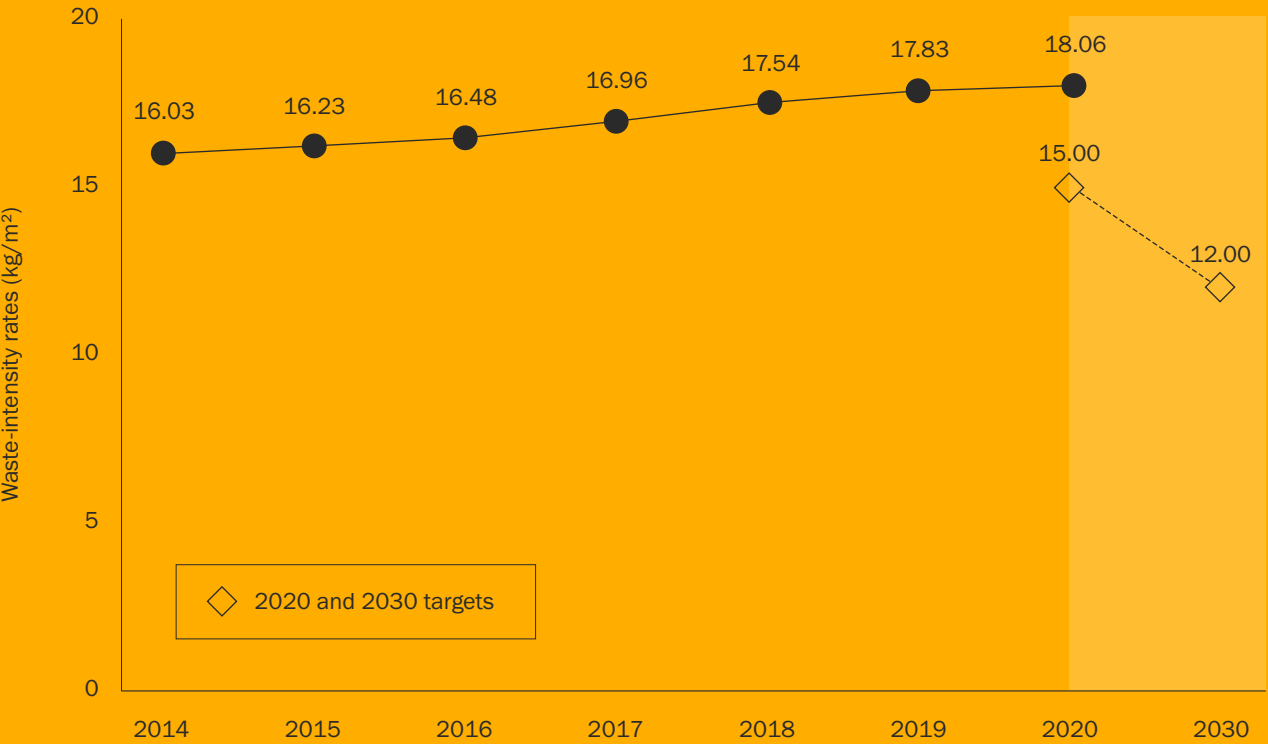
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# Waste-Intensity Rates

The waste-intensity rate indicates whether or not we are reducing total waste generated for all Fraser Health-owned acute and residential care facilities, and is measured in kilograms of waste generated per square metre of facility space (kg/m<sup>2</sup>).



12.9%

Total waste generated has increased by 12.9% since 2014.





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## OUR STORY

# Reducing plastic and saving money

Staff identifying opportunities and finding ways to reduce waste is essential to make all B.C. health authorities greener and more environmentally sustainable, says Berna Marcelino, Provincial Director, Standardization with PHSA Supply Chain. “It’s the end-users who really improve sustainability. Yes, it’s Supply Chain that purchases products, but frontline caregivers use those products, see how much waste is being generated and can identify these important opportunities for sustainability.”

One direct-care team took action to make an environmental change and cut plastic waste in their work, specifically the plastic bags and tubing that came along with sitz baths — basins commonly used after childbirth for people to sit in warm, shallow water. Province-wide, 6,220 sitz basins were used between April 2018 and March 2019. A group in the postpartum ward at BC Women’s Hospital + Health Centre noticed that care providers on the Postpartum team didn’t use them and had been concerned about the plastic waste for years: “The bags were such a waste that nobody used,” says Parm Kaila, an antepartum/postpartum RN.

PHSA Supply Chain worked with the sitz basin vendor to learn about how to customize the product to remove the unnecessary plastic. Supply Chain also reached out to all B.C. health authorities to assess clinical needs and historical usage data. The switch has not only reduced plastic waste, but also saves money for the B.C. health-care system by reducing the bag-free sitz basin cost by about 20%.



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## OUR STORY

# Necessity pushes green supply of isolation gowns

Level 2 isolation gowns provide a fluid-resistant barrier between health-care providers and the environment, helping to keep staff safe. The onset of the COVID-19 pandemic placed immediate and significant constraints on supply chains for disposable Level 2 isolation gowns, particularly at Fraser Health facilities, which account for 75% of the Lower Mainland's disposable gown consumption. To address the issues of supply availability and waste, Surrey Memorial Hospital (SMH), which alone constitutes 50% to 75% of Fraser Health's disposable gown usage each week, was selected as the site of a pilot project for reusable isolation gowns.

The Surrey Memorial Hospital Isolation Gown Augmentation Project was the result of collaboration that began with PHSA Supply Chain engaging Business Initiatives & Support Services (BISS) to assess opportunities to supplement the inventory of disposable gowns with reusable products. The two departments, together with SMH Site Operations, undertook data analysis, supported the change management process, issued site-wide communications and implemented the new service model — a reusable gown rental program with health-care vendor K-Bro Linen Systems.

Kelly Rezanoff, the Site Operations manager, was very pleased with the transition. "This project was very much a collaborative approach, focusing not only on economic benefits, but environmental sustainability and provider satisfaction as well," Kelly says. "It demonstrates that waste prevention from the source is the best way to reach our goals, and the project is a really great example of health care shifting from a linear to a circular economy.

Initial conversations, data gathering and analysis began in June 2020, and the switch to reusable gowns began just two months later. By February 2021, reusable gowns comprised 97% of gowns used at the site. This result was a massive change from March 2020, when reusables made up only 4%

of gown use. Approximately 869,000 disposable gowns were kept out of landfills or incinerators during this time, saving \$45,000 in waste disposal costs.

Reusable isolation gowns can be used up to 75 times (laundered after each use). On a per-use basis, reusable gowns are nine times cheaper than disposables, resulting in \$2 million of savings at SMH between August 2020 and February 2021.

The project's success has been attributed to multi-department collaboration and full buy-in from all involved. SMH Site Operations plans to continue with the reusable gowns, which staff found to be comfortable and of high quality.

Peter Birovchak, regional director of Lower Mainland Laundry and Patient Transportation Services, is proud of the project. "I was happy knowing the staff were receiving a safe, reliable and local supply of reusable isolation gowns," Peter says. "The savings achieved definitely exceeded my expectations, and knowing we had a positive impact on the environment by reducing waste output certainly gave me some peace of mind."



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## SAFER CHEMICALS

The Safer Chemicals program aligns with international efforts to recognize that there are chemicals of concern contained in man-made products, including those used in our hospitals for construction, furnishing, maintenance, cleaning, disinfection and patient care. Chemicals of concern refer to chemicals that, through credible evidence, have or can have adverse health effects to people or the environment, including carcinogenic and reproductive/development toxicants, and those that are persistent, bioaccumulative and toxic to the environment.

The Safer Chemicals program aims to develop a strategy across the four Lower Mainland health organizations that:

- Aligns health-care sites with work undertaken by Workplace Health & Safety, Infection Control and other clinical stakeholders in order to develop toxicity reduction targets and create a pathway towards safer chemicals
- Identifies potential chemicals of concern, including using requests for proposals to ask vendors to declare chemicals of concern in their products
- Develops a list of chemicals of concern for health-care site construction and operations

## OUR STORY

# Safer chemicals for patient care

Ingredients in skin and wound products may include chemicals of concern — chemicals that negatively affect human and environmental health. A recent collaborative project is seeking to reduce the use of hazardous skin and wound products in patient care by preventing their purchase.

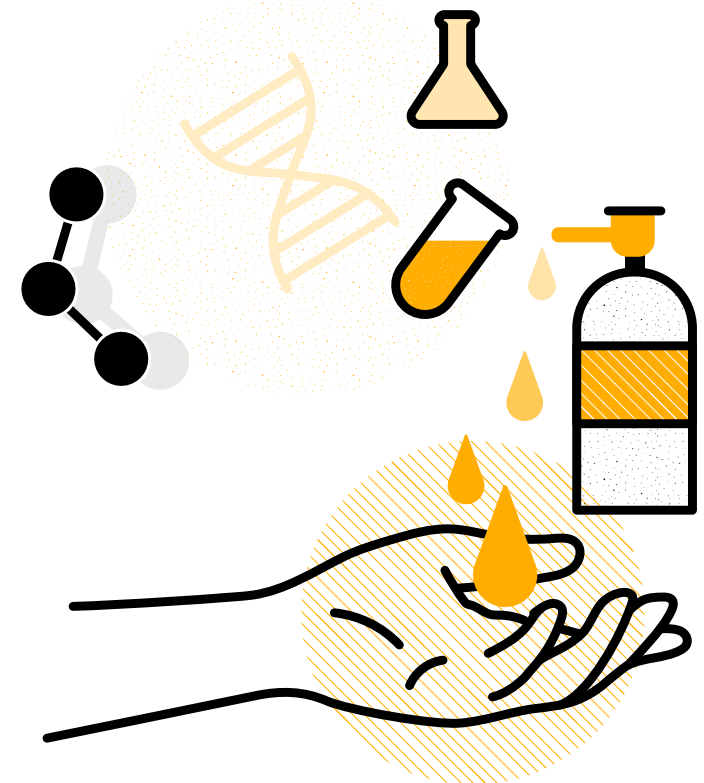
The project, Aligning Safer Chemicals with Patient Care in BC Health Care Facilities: Research, Development, Engagement, was undertaken by the EES team, a UBC sustainability scholar, and the British Columbia Provincial Skin & Wound Committee (PNSWC), and builds on the EES Safer Chemicals program.

The project considered the chemical ingredients within three types of products: skin cleansers, moisturizers and barriers. Researchers created a chemical inventory database and implemented a chemical screening framework to categorize inventoried chemicals by hazard and assessed level of risk. Co-mentor Shannon Handfield notes that UBC Sustainability Scholar Anuradha Ramachandran's work "has provided a clear, well-researched, evidence-based method of identifying high-risk chemicals of concern."

The screening framework was developed with reference to work by authorities such as the Environmental Protection Agency, the International Council of Chemical Associations and Green Screen. These authorities have documented human health concerns that range from skin irritation to toxicity and cancer, and environmental health concerns like toxicity in land and water environments, continuous buildup of chemicals in organisms, and the inability of some chemicals to break down.

Thanks to this project, PNSWC can advise which are the least harmful products at the time of procurement. "When Supply Chain brings forward a skin care product for contract consideration, the product's ingredients are run through the screening framework to identify the level of concern for each ingredient," Shannon explains.

Aligning Safer Chemicals represents the start of what is expected to be an ongoing endeavour. Of the approximately 385 ingredients in skin care projects identified by PNSWC, the project considered 60; there are many more chemicals found in skin and wound products used in clinical settings that still need to be screened and assessed. As authorities continue to research and publish new information on chemical hazards, the project's chemical inventory will be updated and expanded in order to avoid chemicals of concern in more skin and wound products. Once all ingredients have been screened, a process to keep the list up to date will be developed. The EES team and PNSWC plan to use the inventory to engage clinical staff and organization leaders about safer chemicals and their procurement.





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## Our successes

From January 1, 2020 to December 31, 2020, a total of 1,771 Fraser Health staff completed the online Waste Management Basics Learning Module available on LearningHub, up from 721 in 2019. This module familiarizes learners with the impacts of improper waste management and about how to discard different types of waste appropriately.

Jim Pattison Outpatient Care and Surgery Centre hosted two back-to-back Waste Reduction Workshops in October 2020, facilitated by the EES team. These interactive sessions saw Medical Day Care staff brainstorm how to integrate waste avoidance, reuse and reduction into their work in tangible ways. Between the two sessions, a total of 18 staff attended and more than 50 ideas were generated.

## Challenges we face

Waste-diversion rates seem to plateau at approximately 40%, a trend seen at all sites in the Lower Mainland. Some reasons for this stall are outside of Fraser Health's control, such as recycling markets not accepting many of the materials produced in health care. However, Fraser Health can also take more aggressive action to reduce garbage waste and look for new streams of recycling.

As with everything in 2020, waste reduction and recycling took a backseat to the COVID-19 pandemic. Staff who were already busy were completely dedicated to the health emergency and had little time for other considerations. Additionally, recycling was paused due to concerns for the staff at recycling facilities. The pandemic shone an even brighter spotlight on the unnecessary waste health care is generating, and our challenge became to find ways to support the pandemic response through waste reduction and conserving the resources we had.

## The work isn't finished

We want to build on 2020 successes by continuing to find opportunities to embed waste reduction into practice and by finding co-benefits, including cost savings and supply chain stability. We will also continue to engage key clinical stakeholders, such as Infection Prevention & Control (IPAC) and Workplace Health & Safety. Finally, we want to continue to work with staff in PHSA Supply Chain to understand procurement processes in Fraser Health and work towards environmentally preferable policies and practices.

### COVID-19 has impacted staff behaviour when it comes to waste.

When asked how COVID-19 has impacted the actions they take to reduce environmental impact in health care, Fraser Health staff reported:<sup>E</sup>

- An increased amount of waste, due to increased use of PPE and changes to work practices and protocols
- A decreased amount of paper waste, due to increased use of digital platforms and reduced printing when working from home



Hospital waste at Urban Impact recycling depot

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# 4.0 Writing the Story We Want, Now and in the Future

Thank you for your  
ongoing support.

From the successes in Fraser Health to the challenges still faced, it's clear: environmental sustainability is everyone's story. If we are to address the impacts of our climate reality, ensure that we are making responsible choices for our environment, and continue to offer our staff, volunteers and patients the very best quality of life possible, together we must all take a leading role. The EES team invites the whole health-care community to take actions that transform their workplaces and communities in order to restore and regenerate the interdependent health of people, place and planet — now and for future generations.

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This report has been compiled by Be the Change Group for GreenCare's Energy and Environmental Sustainability team.

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**There are a number of ways  
in which you can make a  
difference.**

### LEAD BY EXAMPLE.

Look for opportunities to reduce  
environmental impact in the workplace.

### YOUR VOICE MAKES A DIFFERENCE.

Talk to your colleagues and see how you  
can work together.

### PARTICIPATE.

Attend and support environmental sustainability  
events and actions.

### LEARN MORE ABOUT SUSTAINABLE AND RESILIENT HEALTH CARE.

Check out the GreenCare website [here](#).

### MEET OTHERS INTERESTED IN ENVIRONMENTAL SUSTAINABILITY.

Find out more about the Green+Leaders  
program [here](#).

### INSPIRE.

Share your environmental sustainability story [here](#).

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- E 2021 Fraser Health GreenCare Survey [Internet]. British Columbia, Canada: GreenCare Community; 2021 [cited 2021 Jun 23]. Available from: <https://bcgreencare.ca/fhsurvey>
- F Program staff partner with FortisBC and BC Hydro to attract funding support for energy conservation and efficiency projects, with the incentives received from industry partners used to supplement the project funding. The implementation of these projects directly reduces operating expenses and the environmental impact of Lower Mainland health organization sites.
- G Healthcare [Internet]. ASHRAE. [cited 2021 Jul 14]. Available from: <https://www.ashrae.org/technical-resources/healthcare>
- H Currently, there are no targets for Safer Chemicals.

