King County Housing Authority

We transform lives through housing

Environmental Sustainability Plan

2017 – 2021

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KCHA Resource Conservation Program
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Environmental Sustainability Plan:

2017 – 2021

Introduction

King County Housing Authority continues to reduce its environmental footprint with the new 2017 – 2021 Environmental Sustainability Plan. The Plan provides the framework for the Housing Authority to move to a higher level of sustainability, balancing costs with environmental benefits and the impacts to the people who live and work at KCHA properties.

History of Sustainability at KCHA

KCHA's commitment to environmental sustainability spans more than a decade. Beginning in 2004, the organization began investing resources and developing strategies to reduce its impact on the environment through the following directives:

- The Sustainability Project (O'Brien & Co.) report (2004)
- KCHA Board Resolution 5005 Commitment to Sustainable Communities Through Excellence in Environmental Stewardship (2005)
- Establishment of Resource Conservation Department (2005)
- Resource Management Plan (2011 – 2016)

Sustainability Accomplishments

KCHA's long history of sustainability efforts has resulted in a variety of environmental achievements. Energy and water efficient building upgrades have saved roughly $170 thousand since 2011. 100% of KCHA properties have recycling services, which has saved an estimated $72 thousand per year since 2014. Overall water use per person has dropped by almost 9% since 2010, and since 2012 whole property energy use has been reduced by 5%. KCHA has established green purchasing policies, built LEED certified green buildings and engaged with residents about utility bill and healthy home management strategies. For more details about KCHA's environmental accomplishments see Appendix C.

The New Sustainability Plan

Building on the success of the Resource Management Plan (2011-2016), the new Environmental Sustainability Plan (2017-2021) incorporates existing initiatives with new ones, and identifies new five-year goals for seven Sustainability Measures (Appendix A). Each measure will be impacted directly or indirectly in the following three general areas within KCHA:

- **Sustainable Operations:** The administrative and property management functions of KCHA continue to show significant gains in reducing energy, water and solid waste utility costs and CO2 emissions, as well as improving indoor air quality and exposure to harmful chemicals. Over the next 5 years, new initiatives will standardize maintenance and landscaping practices, establish a sustainable property management guide and assessment tool, and meet the State of Washington's upcoming requirement for purchasing only alternative fuel vehicles. KCHA also plans to standardize sustainable preventative maintenance practices in order to extend the life of buildings and their mechanical systems.

- **Sustainable Development & Renovation:** KCHA manages a variety of construction and development projects, including low-income weatherization for KCHA and private property owners, complete development and redevelopment of properties, and apartment renovation and minor building repair work. Generally, major development and renovation projects utilize Low Impact Development (LID) standards required for funding purposes. For projects not subjected to regulatory standards, KCHA plans to develop LID and construction standards for both staff and private contractors to follow. KCHA also plans to evaluate the effectiveness of environmental design strategies for new construction to improve future construction projects.

- **Sustainable Communities:** KCHA residents play a key role in helping to reduce environmental impacts through the efficient use of utilities and the management of their own living environments. Over the next 5 years and beyond, KCHA plans to work with residents and staff to learn how to help residents reduce utility bills, improve indoor air quality and keep properties litter free.

Sustainability Plan Strategy

To achieve success with so many environmental initiatives, KCHA typically begins by making capital improvements to properties, then focuses on maintenance and management, and lastly works directly with residents to help them save money and improve environmental outcomes. Over the next 5 years, this strategy will continue. KCHA will complete a second Energy Performance Contract (EPC) project in 2017, the Maintenance and Management phase will be emphasized in years 2017-

2019, and Resident Engagement activities will continue throughout the five year period with more focus during the last years of the plan. See Appendix B for additional timeline detail.

Special Initiatives

The plan includes three special initiatives, which will focus on exploring the behavioral and systematic barriers that impact environmental outcomes and establishing a strategy for creating lasting environmental benefits.

- **Landscape Management:** Managing landscapes to be attractive with fewer resources and impacts to the environment.
- **Waste Management:** Reducing, reusing, and recycling all possible waste generated by KCHA.
- **Resident Engagement:** Empowering residents to improve environmental, health and economic outcomes.

How to Read the Sustainability Plan

There are two guiding documents for the 2017-2021 Plan which outline the goals and initiatives, and how and when the initiatives will be accomplished. These guides are presented in a tabular format, and therefore some guidance in how to read them might be helpful.

1. Sustainability Plan Goals & Initiatives (Appendix A): This document presents two key pieces of information—the seven Sustainability Plan Goals, which will be used to measure the impact of initiatives, and a matrix that shows which initiatives directly or indirectly impact the goals.

2. Sustainability Plan Initiatives & Timeline (Appendix B): This document includes a list of initiatives, deliverables and a timeline for implementing the initiatives. Initiatives are organized within three Target Areas—Sustainable Operations, Sustainable Development & Renovation, and Sustainable Communities. Following is a description of each of the column headers:

- **Initiatives:** Sustainability type activities identified to achieve stated Sustainability Plan Goals over next five years.
- **Steps to Implementation:** General tasks to accomplish initiatives. These include the creation of actual products (e.g., a plan, tool, or policy) and/or the main steps required to complete an initiative. Products are designated with "•" and ongoing work with "**x**".
- **Timeline (2017-2021):** Provides a five year look at when the products "•" will be completed and ongoing work "**x**" accomplished.
- **Products:** The plan, tool, and/or policy that will be developed for a specific initiative.
- **Measurements (Outputs and *Indicators):** Since some initiatives do not directly impact the seven Sustainability Plan Goals but still have environmental benefits, tracking and reporting

outputs (i.e., things that can be counted) and indicators (i.e., visual signals or cues) provide KCHA another method for gauging success.

- **National/Local Programs (Current or Potential):** Lists national and local programs that are already in existence and that are helping guide the Sustainability Plan initiatives.

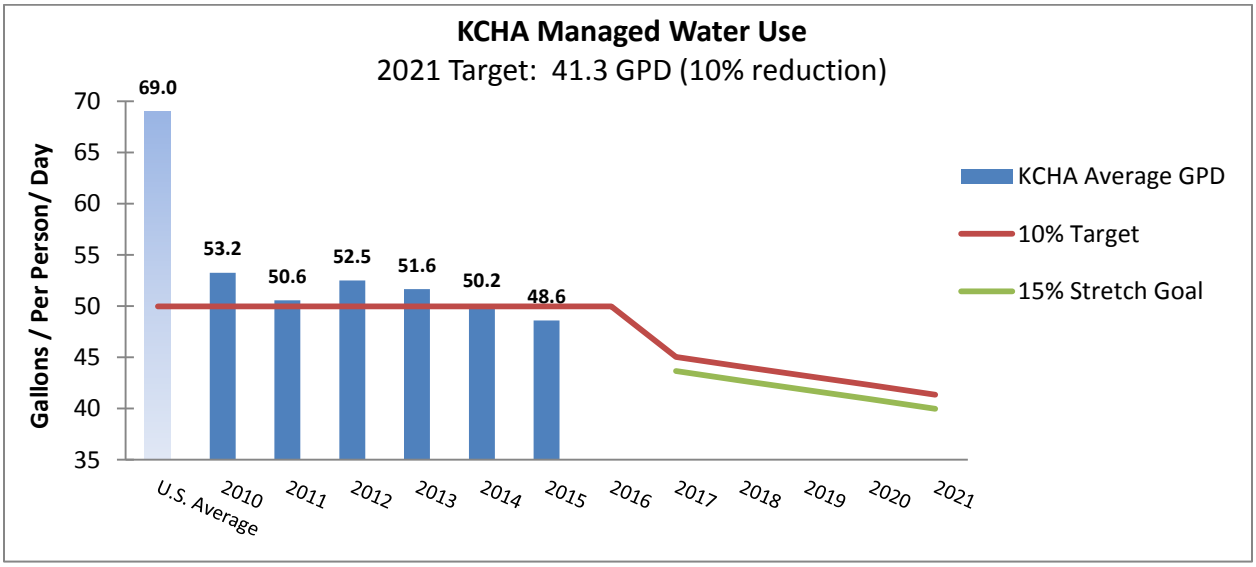
Measuring Success

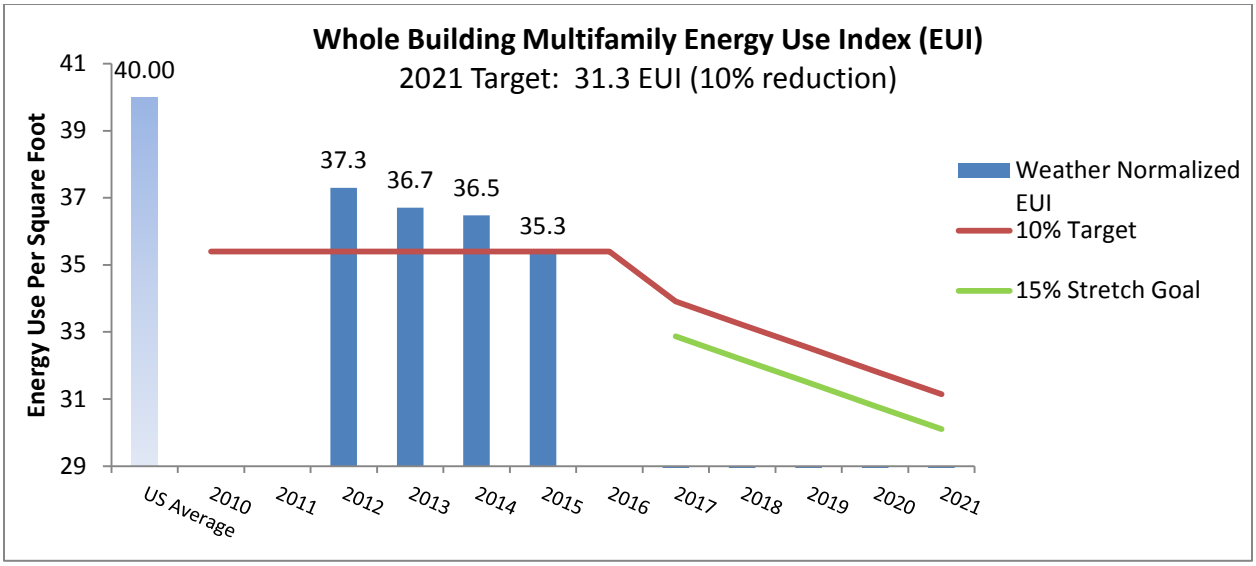
Though each of the initiatives outlined in Appendix A are designed to reduce KCHA's environmental footprint, not all provide a practical means of measurement. The following seven Sustainability Plan Goals were selected to track KCHA's progress towards improved environmental outcomes. By 2021, KCHA plans to achieve the following goals:

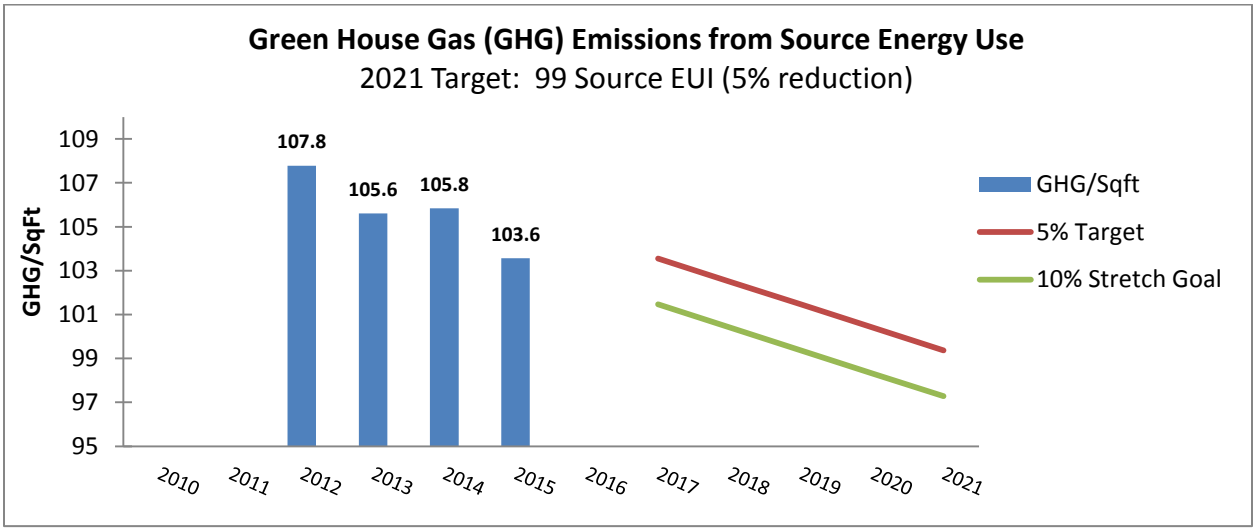
Sustainability Plan Goals

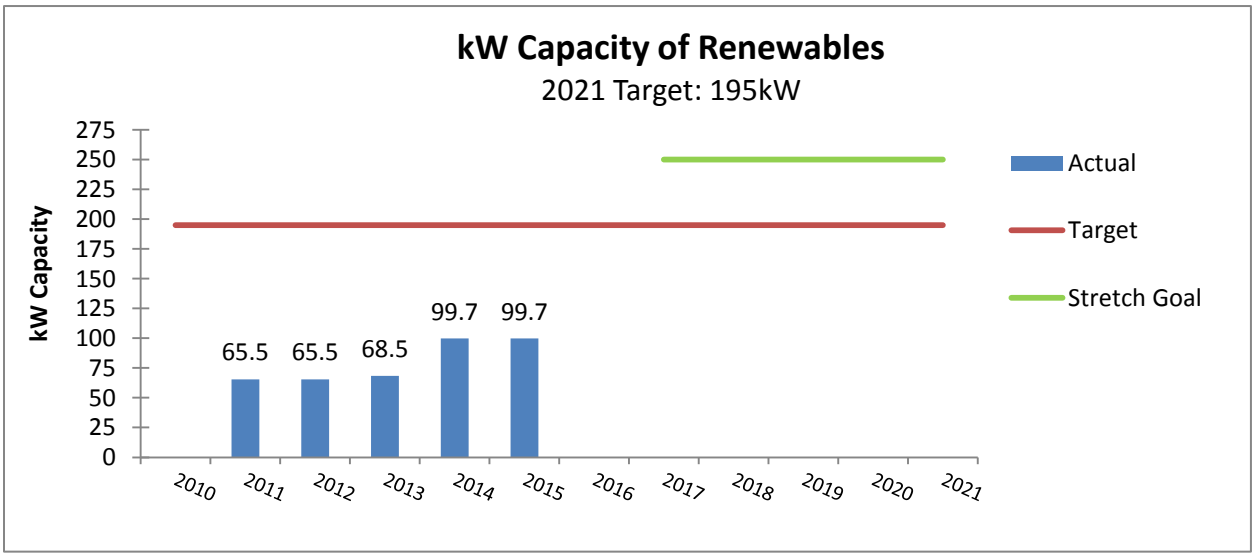
- 10% reduction in gallons per day per resident (GDP) water consumption for multifamily properties without irrigation and managed by KCHA.
- 10% reduction in energy use per square foot (EUI) for all multifamily KCHA properties.
- 5% reduction in greenhouse gas emissions (GHG) from building electricity and gas consumption.
- 100% increase in capacity of renewable energy systems.
- 55% recycling and organic waste composting diversion rate.
- 100% of qualified properties certified as 3 stars or greater in the King County EnviroStars program.
- 31% of KCHA fleet using alternative fuels.

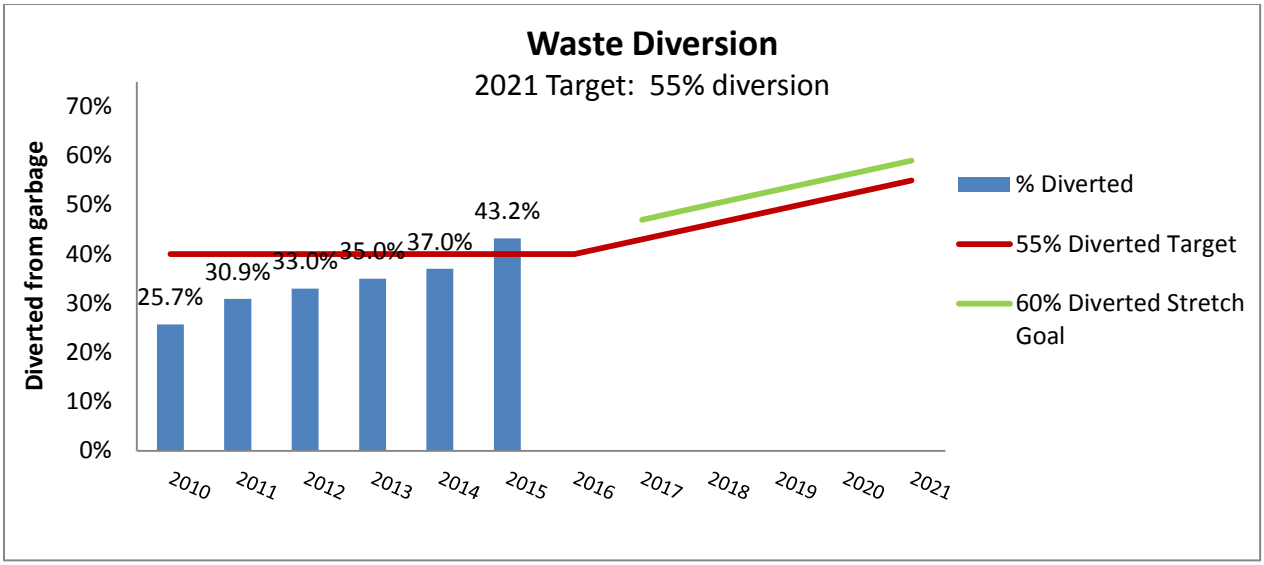
Summary Tables: 7 Sustainability Plan Goals

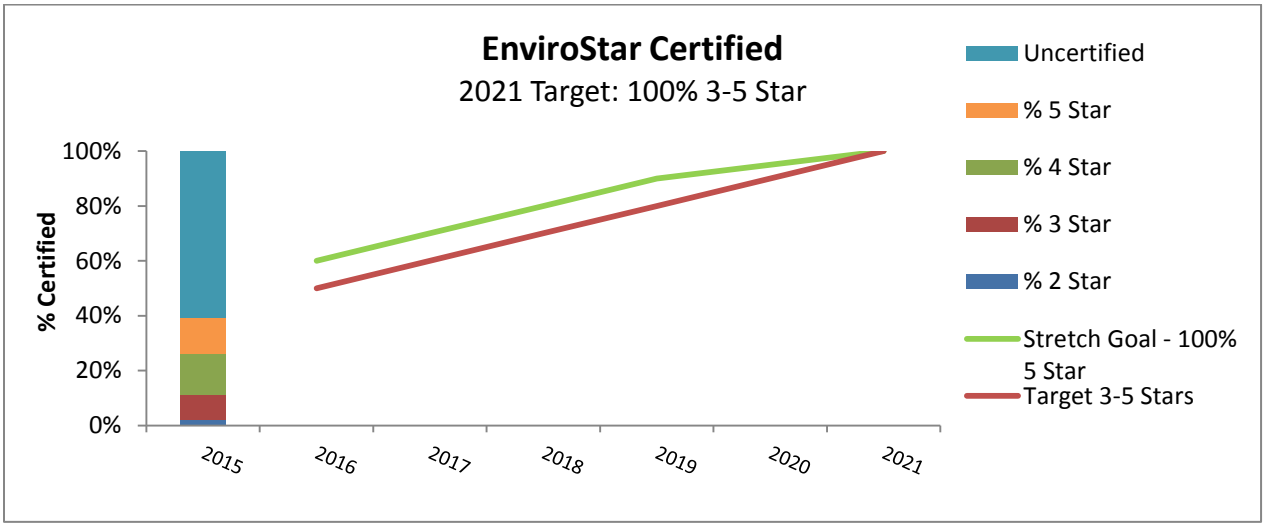


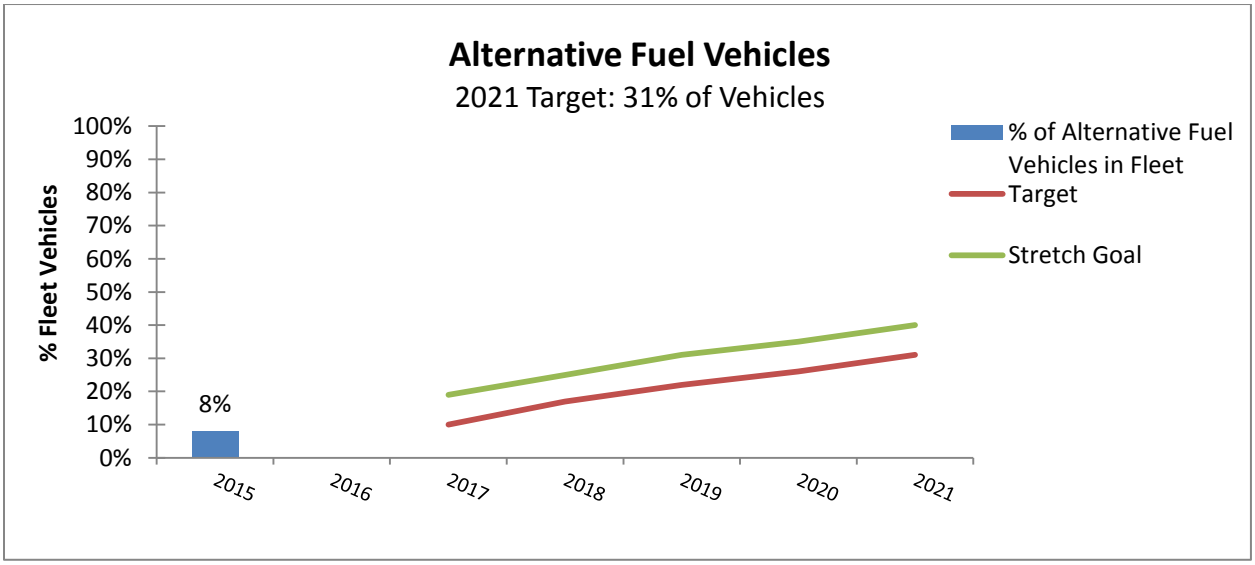

Whole Building Multifamily Energy Use Index (EUI)
2021 Target: 31.3 EUI (10% reduction)
Energy Use Per Square Foot
41
39
37
35
33
31
29
40.00
37.3
36.7
36.5
35.3
US Average
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Weather Normalized EUI
10% Target
15% Stretch Goal


Green House Gas (GHG) Emissions from Source Energy Use
2021 Target: 99 Source EUI (5% reduction)
GHG/SqFt
109
107
105
103
101
99
97
95
107.8
105.6
105.8
103.6
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
GHG/Sqft
5% Target
10% Stretch Goal


kW Capacity of Renewables
2021 Target: 195kW
kW Capacity
275
250
225
200
175
150
125
100
75
50
25
0
65.5
65.5
68.5
99.7
99.7
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Actual
Target
Stretch Goal


Waste Diversion
2021 Target: 55% diversion
Diverted from garbage
70%
60%
50%
40%
30%
20%
10%
0%
25.7%
30.9%
33.0%
35.0%
37.0%
43.2%
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
% Diverted
55% Diverted Target
60% Diverted Stretch Goal


EnviroStar Certified
2021 Target: 100% 3-5 Star
% Certified
100%
80%
60%
40%
20%
0%
2015
2016
2017
2018
2019
2020
2021
Uncertified
% 5 Star
% 4 Star
% 3 Star
% 2 Star
Stretch Goal - 100% 5 Star
Target 3-5 Stars


Alternative Fuel Vehicles
2021 Target: 31% of Vehicles
% Fleet Vehicles
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
8%
2015
2016
2017
2018
2019
2020
2021
% of Alternative Fuel Vehicles in Fleet
Target
Stretch Goal

Goals & Initiatives 2017 – 2021 (Appendix A)

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2017-2021 Year-End Goals							
7 Sustainability Plan Goals	**2016 (Baseline)**	**2017**	**2018**	**2019**	**2020**	**2021**	**2021 Stretch Goal**
10% reduction in gallons per person per day (GPD) for multifamily properties (without irrigation)	45.9 GPD	45.0 GPD	44.1 GPD	43.2 GPD	42.3 GPD	41.3 GPD	39 GPD
10% reduction in normalized energy use per square foot (EUI) for all multifamily properties	34.6 EUI	33.9 EUI	33.2 EUI	32.5 EUI	31.8 EUI	31.1 EUI	30.1 EUI
5% reduction in greenhouse gas emissions (GHG) from all building types (electricity and gas only)	104.6 Source EUI	103.6 Source EUI	102.5 Source EUI	101.5 Source EUI	100.4 Source EUI	99.4 Source EUI	97.3 Source EUI
100% increase in capacity of renewable energy systems installed	98.6 kW	195 kW	195 kW	195 kW	195 kW	195 kW	250 kW
55% recycling and organic waste composting diversion rate	40%	43%	46%	49%	52%	55%	60%
100% qualified properties certified as 3 EnviroStars or greater	50%	60%	70%	80%	90%	100%	100% 5 Stars
31% KCHA vehicles use alternative fuel	8%	10%	17%	22%	26%	31%	40%

2017-2021 Initiatives	Water	Energy	Greenhouse Gas Emissions (buildings)	Renewable Energy	Diversion (recycling & organics)	EnviroStars (Hazardous Waste)	Alternative Vehicles
Sustainable Operations							
KCHA Administration							
Green Team initiatives	x	x			x	x	
RC staff engagement plan	x	x	x		x		
Multifamily resident engagement partnerships	x	x			x		
Resource conservation tracking database	x	x			x		
Commute Trip Reduction (CTR) efforts			x				x
Fleet management			x				x
Property Management							
Sustainable property management guidelines	x	x	x		x	x	
Preventative maintenance checklist and specifications	x	x	x				
Green purchasing policy	x	x	x		x		
Utility bill management and monitoring	x	x			x		
Water							
Water efficiency measures	x						
Energy							
Energy Star certification		x	x				
Better Building Challenge		x	x				
Install solar or other renewables		x	x	x			
Puget Sound Energy's RCM program		x	x				
GHG emissions from source EUI		x	x				
Solid Waste							
Residential waste auditing					x		
Self-haul management					x		
Illegal dumping management					x		
Construction and Demolition waste management					x		
Hazardous Waste							
EnviroStar certification program						x	
Landscapes							
Sustainable landscape management	x		x		x	x	

2017-2021 Initiatives	Water	Energy	Greenhouse Gas Emissions (buildings)	Renewable Energy	Diversion (recycling & organics)	EnviroStars (Hazardous Waste)	Alternative Vehicles
Landscape maintenance standards & specifications	x		x		x	x	
Irrigation system management	x						
Irrigation & rainwater harvesting	x						
Storm water & natural drainage systems			x				
Sustainable Development & Renovation							
New Construction, Renovation and Repair							
Low-impact development principals	x	x	x	x			
Standard design and construction specifications	x	x	x		x		
Successful design elements of KCHA developments	x	x					
Energy Performance Contract (EPIC)	x	x					
Energy & water rebates	x	x	x				
Research and evaluation of new and installed technologies	x	x		x			
Unit turns and special projects	x	x			x		
Weatherization							
Weatherization projects		x	x	x			
Sustainable Communities							
Resident Engagement							
Resident engagement	x	x			x		
Resident surveys	x	x					

Initiatives & Timeline 2017 – 2021 (Appendix B)

"X" indicates ongoing implementation of an initiative, "•" indicates a product created by an initiative

Initiatives	Steps to Implementation	2017	2018	2019	2020	2021	Products (•completion year)	Measurements (Outputs and *Indicators)	Guiding Programs (Current or Potential)
Target Area: Sustainable Operations		**Timeline**							
KCHA Administration									
Green Team initiatives	x Quarterly team meetings x Develop projects x Implement projects	X	X	X	X	X		# Outputs from projects	
Resource conservation communication plan to engage staff	• Develop communications plan x Implement communications plan x Evaluate effectiveness of plan	•	X	X	X	X	•RC Communications Plan		
Multifamily resident engagement partnerships	x Identify potential partners (HUD, water and energy utilities, etc.) with interest in multifamily engagement x Connect with partners x Share information to gain broader understanding of target populations	X	X	X	X	X			
Resource conservation project tracking database	• Build RC database x Track RC related activities x Identify new RC activities and evaluate completed projects	•	X	X	X	X	•RC activities database		
Commute Trip Reduction (CTR)	x Implement required WA biennial CTR survey • Develop Commute Trip Reduction Plan x Implement Plan	X	•	X	X	X	•Commute Trip Reduction Plan	% survey response rate % Drive Alone Rate # Vehicle Miles Traveled # employees w/Puget Pass *Available parking at CO	WA requirement - Implement CTR survey
Fleet management	• Develop fleet plan • Develop GHG emissions tracking tool for annual reporting	•					•Sustainable Fleet Plan •GHG fleet tool	# miles per gallon # alternative fuel vehicles # electric vehicle charging stations	WA requirement - Only purchase alternative fuel vehicles by 2018

Initiatives	Steps to Implementation	2017	2018	2019	2020	2021	Products (•completion year)	Measurements (Outputs and *Indicators)	Guiding Programs (Current or Potential)
Sustainable Operations, cont'd		**Timeline**							
Property Management									
Sustainable Property Management	• Develop guide and assessment tool x Guide implementation with property managers		•	x	x	x	•Sustainable Property Management Guide & Assessment Tool	# completed by RC staff/Property Management	
Preventative Maintenance Checklist and Specifications	x Review current maintenance practices • Develop standard preventative maintenance checklist and specifications for repairs x Test in field and update	x	•	x	x	x	•Preventative Maintenance Policy, Checklist and Specs		
Green Purchasing Policy	• Review and update current procurement policy x Communicate policy to staff x Evaluated effectiveness of policy		• x		x		•Sustainable Purchasing Policy	*Green products mostly purchased	
Utility bill monitoring and management	x Manage over 1,000 water, sewer, electric and gas utility accounts • Produce monthly Property Management Monitoring report x Track consumption trends to identify billing errors, high use or data management issues	x•	x•	x•	x•	x•	•Monthly PM Monitoring Report	# properties tracked in Portfolio Manager and Utility Manager	
Water Management									
Water efficiency	x Identify opportunities in residential indoor, outdoor irrigation, commercial and pools x Develop strategies to improve efficiency via behavior change or technology upgrades x Implement programs and/or projects	x	x	x	x	x		# technologies installed # properties participating in programs	WaterSense Products or Partners
Energy Management									
Energy Star Certification	• Explore feasibility of complying with Energy Star score and certification requirements x If feasible, certify properties	•	x	x	x	x	• Decision to participate in Energy Star certification for additional properties	# multifamily, office and other Energy Star certified	Energy Star Certified Energy Star Partner
Better Building Challenge	• Develop implementation plan x Track energy use x Report results	•	x	x	x	x	• Better Building Challenge Implementation Plan	# properties participating	Better Building Challenge

Initiatives	Steps to Implementation	2017	2018	2019	2020	2021	Products (•completion year)	Measurements (Outputs and *Indicators)	Guiding Programs (Current or Potential)
Sustainable Operations, cont'd		**Timeline**							
Energy Management									
Add additional renewables	x Apply for utility and Commerce funding for solar, align goal with KC's Climate Action Plan x Select and install solar x Report results	x	x	x	x	x		# kW capacity of solar installations # rebated projects – Dept. of Commerce grants	Renew 300 – HUD's Renewables Initiative
Puget Sound Energy Resource Conservation Manager program	x Track energy consumption for properties x Implement engagement activities x Complete quarterly checklists	x	x	x	x	x		# $$ received from PSE	PSE's RCM program
GHG emissions from source EUI	x Determine how or what to track, measure and report for GHG emissions from source EUI in Portfolio Manager	x	x	x	x	x		# GHG emissions	King County-Cities Climate Collaboration/KC Strategic Climate Action Plan
Waste Management									
Residential Waste Management	x Waste audits x Right size garbage and resident engagement x Service changes	x	x	x	x	x		# gallons garbage/person % diversion # on-site events # properties w/ food waste services for residents *No recyclables in garbage	
Self-haul Management	x Assess current practices and review billing data • Develop tools, guides x Report impact	x •	x	x	x	x	•Self-Haul Tool and Guidelines		
Illegal dumping Management	x Research current issues • Develop tools, guides x Report impact	x	•	x	x	x	•Illegal Dumping Best Practices Guide	*No items illegally dumped	
Construction and Demolition (C&D) waste management	x Research current practices and data • Develop tools, guides and policy x Evaluated effectiveness of policy	x	•		x		•C&D Waste Management Policy	*C&D being sorted at construction sites	King County Diversion Requirements Ordinance 18166
EnviroStars	x Identify properties x Implement EnviroStars tool x Complete EnviroStars process	x	x	x	x	x		# Certified EnviroStars *Hazardous waste stored properly	EnviroStars

Initiatives	Steps to Implementation	2017	2018	2019	2020	2021	Products (•completion year)	Measurements (Outputs and *Indicators)	Guiding Programs (Current or Potential)
Sustainable Operations, cont'd		**Timeline**							
Landscape Management									
Sustainable Landscape Management	x Train staff x Assess barriers and impact of current Landscape Maintenance Manual practices	X	X	X	X	X		# staff trained # EcoPro certified staff *Beds mulched *Plants pruned properly *Grass mulch mowed *Integrated Pest Mgmt. (IPM) strategies utilized	
Landscape Maintenance Standards & Specifications (LMSS)	x Review current LMSS • Update LMSS x Evaluate LMSS effectiveness	X	•		X		•Landscape Maintenance Standards & Specifications		
Irrigation systems	x Identify properties with irrigation x Audit irrigation systems, calculate efficient schedules, train staff on scheduling techniques x Evaluate impact of efficiency measures	X	X	X	X	X		# irrigation systems tracked # assessed # and type of efficiency measures added *Irrigation schedules documented *Rain sensor installed	
Irrigation & Rainwater harvesting	x Research potential for adding collection systems •Develop rainwater harvesting best practices x If feasible, add rainwater harvesting systems	X	•	X	X	X	•Rainwater Harvesting Best Practices	# p-patch gardens # properties with active gardeners	
Storm water management utilizing natural drainage systems	x Assess opportunities to reduce storm water drainage fee and identify properties with drainage issues • Develop storm water management best practices utilizing natural drainage systems x If feasible, add natural drainage systems	X	•	X	X	X	• Storm Water Management Best Practices	# reduction in storm water fee # natural drainage systems or trees added *No standing water or drainage issues	
New Construction, Renovation and Repair									
Utilize low-impact development principles	x Site assessment/planning x Utilize sustainability design guides x Construction management and inspection	X	X	X	X	X		# BuiltGreen 3 Star certified	Residential: Built Green, Evergreen Certified, Enterprise Certified

Initiatives	Steps to Implementation	2017	2018	2019	2020	2021	Products (•completion year)	Measurements (Outputs and *Indicators)	Guiding Programs (Current or Potential)
Target Area: Sustainable Development & Renovation		**Timeline**							
New Construction, Renovation and Repair									
KCHA Standard Design and Construction Specifications (for projects not subjected to regulatory standards)	x Assess current practices for utilizing design and construction standards • Develop a KCHA design and construction standards	x	x	•			•KCHA Construction Standards	*All projects meet KCHA or regulatory agency standards	Evergreen Sustainable Development Standard – Dept. of Commerce (Housing Trust Fund)
Successful design elements at KCHA properties	x Tour properties with maintenance and property managers post construction, and assess effectiveness of design and quality of construction. • Develop a design guide and/or case studies	x•	x•	x•	x•	x•	•Successful Building and landscape Design Guide/Case Studies	# case studies	
Energy Performance Contract (EPIC)	x 2016 contract completion and construction implementation. • Annual measurement and verification, and potentially on-going increases in scope – 3 years likely longer	x	•	•	•	•	•Annual EPIC measurement and verification reporting for HUD		
Energy & Water rebates	x Select candidates for rebates x Manage projects	x	x	x	x	x		# projects completed # rebate $$ # estimated savings	
Research and evaluation of new and installed technologies	x Identify energy/water/solid waste conservation technologies or projects x Collect data and perform evaluations x Report results	x	x	x	x	x		# technologies reviewed # installed projects evaluated	
New Construction, Renovation and Repair									
Unit turns and special projects	x Review construction specifications • Update construction specifications	x	x	•			•Construction Specification for Contractors	# units upgraded	

Initiatives	Steps to Implementation	2017	2018	2019	2020	2021	Products (•completion year)	Measurements (Outputs and *Indicators)	Guiding Programs (Current or Potential)
Sustainable Development & Renovation, cont'd		**Timeline**							
Weatherization									
Weatherization projects	x Properties selected x Construction x Engagement and evaluation	X	X	X	X	X		# units HA weatherized # estimated savings for residents	HUD – Energy Performance Information Center Report
Target Area: Sustainable Communities		**Timeline**							
Resident Engagement									
Resident engagement (General sustainability measures and EPIC engagement project)	x Research engagement strategy x Pilot engagement initiatives • Develop resident engagement plan and toolkits x Engage residents	X	•	X	X	X	•Resident Engagement Toolkit •Staff Toolkit/Handbook Move-in Packet	# engagement events	
Resident attitude and knowledge survey questions	x Determine usefulness of surveying residents for program planning purposes • Develop survey questions and incorporate into KCHA biennial resident survey	X	•		•		•Resident survey question summary report	# of survey respondents	

Environmental Accomplishments (Appendix C)

KCHA administers a wide range of quality affordable rental and home-ownership programs for residents of King County, Washington. With 142 housing and commercial properties, and 9,359 units of housing, the Authority serves more than 18,000 elderly, disabled and family households, including the Housing Choice Voucher program, on a daily basis. The environmental sustainability of housing and buildings is an important component of KCHA's mission to provide quality affordable housing. The following include highlights of KCHA's environmental accomplishments:

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Key Accomplishments

Energy efficiency

- In 1976, KCHA's established the Weatherization Assistance Program with funding from the U.S. Department of Energy to provide low-income property owners free-of-charge weatherization services. Since 1998, KCHA has spent almost $47 million in federal, state and local grant funds to weatherize 10,898 low-income households in the King County area. Of those, 4,681 units were KCHA owned housing.
- Since 2012, KCHA has reduced the entire portfolio's common area and resident combined energy use per square foot (EUI) by 5%, and lowered common area KCHA paid energy consumption by 10%.
- ENERGY STAR appliances are installed in all residential units, and buildings have been retrofitted with better insulation, more energy-efficient windows and high-efficiency boilers.
- LED lighting has replaced both incandescent and older CFLs to save energy, increase illumination and improve security.
- Since 2011, KCHA has installed almost 100 kW of solar photo voltaic (PV) systems at six properties.

Water Quality and Storm Water Management

- In new developments, permeable surfaces, landscape swales and rain gardens have been installed to filter storm water, and reduce runoff.
- Buffer zones around streams have been added to protect water quality and fish habitat.
- Rainwater harvesting cisterns have been installed at community gardens, and landscapes have been designed to be low maintenance and drought tolerant.

Waste reduction

- 100% of KCHA properties have recycling services, and 16 are composting food.

- KCHA manages all files electronically, and encourages two-sided printing.
- Administrative offices provide recycling, food waste composting, plastic bag, Styrofoam and electronic equipment recycling.
- Donation bins are provided on-site at multifamily properties to help divert reusable items from the garbage.

Human Health

- For all new construction and major renovation projects, KCHA uses green-building principles established by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system, the Master Builders Association of King and Snohomish Counties' Built Green® program, and/or the Evergreen Sustainable Development Standards.
- Often Energy Recovery Ventilation (ERV) systems are installed to improve air quality and reduce the potential for mold.
- Janitorial services are required to use environmentally friendly products and cleaning techniques.
- 42 qualifying properties have been certified by the King County EnviroStars program for exceptional management of hazardous waste materials.
- 100% of properties are smoke-free.
- Many properties have P-Patch community gardens, and often residents are permitted to garden in front of their units or around the property.

Transportation

- KCHA is growing its motor pool and maintenance vehicles fleet of fuel efficient/hybrid vehicles. By 2033, 100% will be non-gasoline powered.
- Transit subsidies are provided to staff and telecommuting options are available to minimize car use. KCHA also offers a guaranteed ride home program for people who commute via vanpool or public transportation.
- Seven electronic vehicle charging stations have been installed at multifamily properties and administrative offices. Six more are planned for the next few years.

Procurement

- We require that the products we purchase have a lesser impact on the environment and human health.
- We urge staff and contractors to reduce consumption in the office, in the management of our properties and during construction.

Resource Conservation

- KCHA employs two full-time resource conservation staff dedicated to implementing the 2011-2016 Resource Management Plan and 2016-2021 Environmental Sustainability Plan. This staff monitors utility bills, assesses properties for environmental improvements, and educates residents and staff about managing utilities and reducing KCHA's impact on the environment.

Property Accomplishments

According to the U.S. Department of Energy, residential and commercial buildings account for 40 percent of the total energy consumed in the U.S. and produce nearly half of the nation's greenhouse gas emissions.

As KCHA develops more efficient new buildings, existing properties are also rehabilitated to reduce their environmental impact. Each KCHA community has its own detailed plan to conserve energy, improve water quality and reduce water consumption. Retrofits have taken place at several properties, including Boulevard Manor in Boulevard Park, Briarwood in Shoreline and Cascade Apartments in Kent.

Not only do these retrofit efforts reduce resource use, they also extend the longevity of buildings and help residents reduce utility costs. Investments in conservation upgrades also reduce the bills to taxpayers by trimming the costs to maintain and operate buildings.

- Weatherization upgrades included insulating roofs and crawl spaces, sealing building exteriors, and installing energy-efficient windows and patio and deck doors.
- ENERGY STAR roofing systems used.
- Obsolete siding replaced with a weather-resistant barrier of rigid insulation covered with fiber cement made from recycled materials.
- Baseboard heaters replaced with high-efficiency heat pumps or boilers.
- Low wattage LED lighting installed.
- Next generation low-flow toilets, faucets and shower heads installed.
- Bath fans installed to improve ventilation and reduce the risk of mold.

Seola Gardens

Seola Gardens in White Center offers sustainable housing that costs less to operate and provides a healthier living environment for families. Replacing the former Park Lake Homes II, an aging public housing complex, Seola includes 172 subsidized rental units and 107 for-sale homes.

The new community is a model of green development, built to strict efficiency standards on energy and water consumption. About half of the rental homes have been strategically sited to be cooled naturally by trees in summer and take advantage of natural light in winter.

- Built to 3-Star Built Green® standards and Evergreen Sustainable Development Standards.
- Units are wired to be solar-ready.
- Rain gardens and a large pond filter surface water before it leaves the site.
- Community design promotes health and wellness of residents with a central park, P-Patch gardens and exercise stations.

Greenbridge

Greenbridge is an award-winning mixed-income, 100-acre sustainable development in White Center. It is a shining example of how green-building principles can be incorporated effectively into a larger residential community.

Greenbridge replaced 569 units of obsolete public housing, originally built for Boeing workers in World War II. When completed, the community will offer over 900 energy-efficient townhomes, cottages, flats, single-family homes and an apartment complex for seniors and persons with disabilities.

The project's environmentally friendly design includes an interconnected network of parks and trails, and a community hub with a new elementary school, early learning center, renovated

community center, public library, YWCA adult learning center, public health clinic, fair-trade coffee shop, and neighborhood-scale retail shops.

- The state's largest residential installation of solar panels on roofs of 24 public-housing units.
- All buildings meet the standard of the Master Builders Association of King and Snohomish Counties Certified 3-Star Built Green®
- ENERGY STAR appliances and low-wattage lighting in all rental units.
- Higher density housing for more efficient land use.
- Sidewalks and trails encourage walking and cycling.
- Permeable surfaces emphasized by narrowing streets, sidewalks, driveways and parking areas.
- Environmentally friendly paints, stains and sealants used throughout.
- 50-year roof and siding on all units.
- Drought-tolerant landscaping reduces irrigation requirements.
- Swales installed in landscapes enhance infiltration and reduce runoff.
- Three storm water detention basins filter pollutants and manage excess runoff.
- Special drains collect clean water from roofs and bypass water quality treatment areas.
- Salvaged 8,463 tons of materials during demolition.

Jim Wiley Community Center

Formerly a cheerless structure with poor ventilation and scant natural light, the renovated Wiley Community Center is the heart and soul of Greenbridge.

A celebrated example of adaptive reuse, the 22,600-square-foot facility features a gym, computer lab, classrooms, a commercial kitchen, community rooms and counseling offices. Previously surrounded by parking on all sides, the center now fronts a new plaza that is a dynamic social gathering place where community events, farmers markets and other activities flourish.

- The community center is Certified 3-Star Built Green® by the Master Builders Association of King and Snohomish Counties.
- Solar panels on roof supply renewable energy to the building.
- Low-wattage LED lighting installed throughout the facility.
- Heating and ventilation system lowers energy costs and reduces environmental impact.
- Plaza covers a storm water detention vault that treats pollutants before discharge.
- Non-toxic natural linoleum flooring installed in hallways.
- Carpet tiles are made from recycled materials.
- Energy-efficient windows and skylights conserve energy while inviting in natural light.
- Original hardwood floors were refinished.
- Two tankless water heaters lower operating and energy costs.
- Renovation vs. demolition saved energy and construction material.
- 50-year roof installed on all units.

The 700 Andover Building

Driven by a desire to locate Section 8 offices within KCHA's headquarters, an adjacent retail strip mall was acquired and remodeled. The development goal for the structure focused on refurbishing the 1978 structure in the most energy-efficient way possible within the limited resources available.

The 700 Andover Building has been hailed nationally by ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers). In 2014, the project won second place in the trade organization's annual Technology Awards, which recognizes outstanding energy-efficient design and operation of commercial buildings.

ASHRAE's November 2014 monthly journal included an article about the project. The story concluded, "This project demonstrates how older existing buildings do not have to be demolished in order to make way for more efficient new buildings, and that this level of energy efficiency is accessible within a modest renovation budget."

As it has from the start, the building operates more efficiently than 95 percent of all office buildings locally. It was done with a modest construction budget of $95 per square foot – $14 of those dollars dedicated to the highly efficient 50-zone HVAC system.

- The building has an EUI of 26 kBtu/sf/yr, which puts it at the top 2 percentile of all office buildings nationwide.
- It is Energy Star Certified, with a score of 98.
- The building was designed to save an estimated $35 thousand per year in energy costs compared to a typical office building.
- "Design for Off" technology shuts off lighting and HVAC systems when rooms are not in use.
- Heating and cooling is provided through 50 individually controlled comfort zones.
- Indoor air is exhausted through dedicated outdoor air ventilation system that operates independently from heating and cooling ducts.
- High-performance windows keep the east-facing side of the building cool on sunny mornings.
- Variable Refrigerant Flow (VRF) heat pump system uses variable speeds and low fan power to create high efficiency.
- Triple-glazed skylights bathe the interior corridors with daylight, allowing for interior lighting to remain off during spring and summer.

Birch Creek

The depressing, barrack-like Springwood Apartments in Kent were transformed into a vibrant and attractive new housing community called Birch Creek. The 262 energy-efficient apartment homes, certified as a 4-Star Built Green® project, allow residents to enjoy better amenities with little increase in energy costs.

The redeveloped campus includes two state-of-the art community centers (one certified as LEED Silver) that serve the job training, health, education and recreational needs of Birch Creek families and the greater Kent community.

The campus is built around a central park and boasts a P-Patch community garden, picnic areas and playgrounds. The redevelopment enhanced environmentally sensitive areas,

including Soosette Creek, a salmon-bearing stream that bisects the property.

An experiment on sustainability also is being conducted at Birch Creek. One building has been fitted with additional green features including roof-mounted solar panels to pre-heat the water supply, dual-flush toilets and triple-pane windows. KCHA is comparing the energy and water consumption in the building with that in an identically configured building to assess the impact of these stepped-up conservation measures.

- 2,100 tons of wood, vinyl and piping plus 2,000 tons of concrete were recycled instead of being dumped in the landfill.
- Aged vinyl siding replaced with durable, low-maintenance fiber cement exteriors.
- The ecosystem of Soosette Creek improved through installing landscaped buffers and erecting a pedestrian bridge with creek viewing platforms.
- ENERGY STAR appliances installed in all units.
- Residents use rainwater collected from roofs to irrigate the P-Patch garden.

Birch Creek Youth Center

The 10,800-square-foot Birch Creek Youth Center is one of two innovatively designed community facilities on the Birch Creek campus. It reflects KCHA's commitment to sustainable development.

Built to LEED standards, the youth center includes a gym with a performance stage, a commercial kitchen, a rec room, meeting space and classrooms. The center supports more than 1,200 Kent-area teens through its programs and activities.

The youth center was built on the footprint of a pre-existing community center in order to prevent any

negative environmental impact to the adjacent salmon-bearing stream. As part of the LEED commitment, a large open space behind the building will be maintained for the life of the structure.

- Certified LEED Silver by the U.S. Green Building Council.
- Every product used was screened to minimize exposure to toxic chemicals.
- More than 80 percent of construction waste was diverted from landfills to recycling facilities.
- Majority of space is bathed in natural light, reducing the building's energy load.
- Energy-efficient lighting used and exterior sun-shades installed.
- Low-flow toilets and showerheads and waterless urinals reduce the building's water use by nearly 50 percent.
- Eco-friendly janitorial services promote good indoor air quality, recycling and occupant health.
- Landscaping features native and drought-tolerant plants.

The Village at Overlake Station

The Village at Overlake Station in Redmond is an environmentally conscious mixed-use development that offers an innovative solution to the interrelated problems of high housing costs, suburban sprawl and traffic congestion.

The first bus transit-oriented development in the nation, the 308 units of attractive workforce housing are located in the heart of the Puget Sound region's high-tech corridor, close to many major employers.

The housing is integrated with a child daycare center built above a bus transit station and park-and-ride lot. Tenants literally can step out their front door, drop off their child at the daycare center and then proceed to the transit center or walk to the many nearby stores and businesses.

- Triples the use of the land by building over an underutilized parking lot.
- Residents are encouraged to use cars less and use transit more, helping ease traffic congestion.
- Located within walking and biking distance of hundreds of jobs and services.
- Solar panels on the roof supply renewable energy to hallways, offices, community spaces and the parking garage.
- New LED energy-efficient lighting in parking garage.

Vantage Point

Vantage Point, a 77-unit apartment community for low-income seniors and persons with disabilities, is situated in the Benson Hill neighborhood in Renton

To encourage socialization and physical activities, the development includes gathering spaces, outdoor activity spaces, gently graded walking paths, and an raised bed community gardens. The property supports energy efficiency, a healthy living environment and simplified maintenance requirements. In addition, the property is situated to take advantage of territorial views and maximize natural daylight and passive solar heating.

Not only is the building sustainable, but it is sustainably located. Sited adjacent to the North Benson Shopping Center, Vantage Point residents are directly across the street from a Fred Meyer and other retail shopping. A fire station and medical clinic are located within two blocks and Valley Medical Center is less than a mile away. King County Metro serves the area with two bus routes. The community also borders a senior community of 164 single-family homes managed by KCHA on a land trust model. When aging homeowners need to transition to apartment living, Vantage Point will be available, enabling them to stay in the community.

- Built solar ready.
- New LED energy-efficient lighting throughout building and parking garage.
- Energy Star equipment and appliances installed throughout.
- Native plants used in all landscaping which will reduce the need for water.
- Permeable parking pavement will reduce storm-water runoff.
- WaterSense low-flow toilets will save water and money.
- On-site community garden provides residents the opportunity to grow fresh, healthy food.
- Located within walking distance of a grocery and retail shopping center.