

Energy Investment Workshop

Environmental Sustainability and Cost Reduction (ESCR)
Program Overview

April 4, 2014

Objectives for Today

- Why investment in energy reduction practices / technology is important
- Show tools / ways to lower barriers to investment
- Clarify the roles that various players have in making this possible
- Set expectations from the Executive

Executive Priorities

Fred Jarrett, Deputy Executive

Priorities for Investment

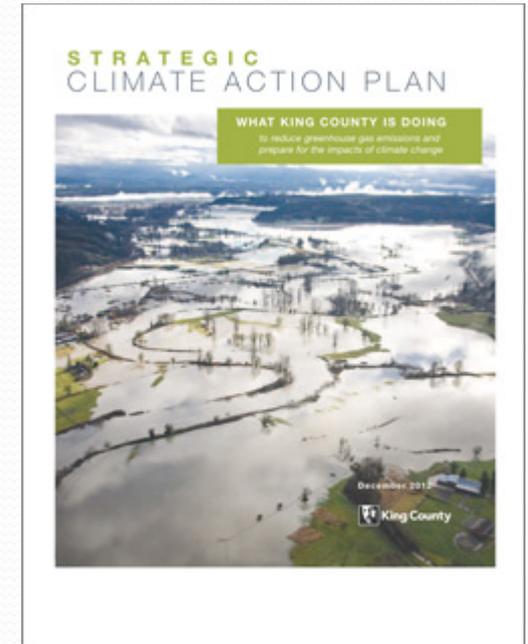
Dwight Dively, PSB Director

Environmental Sustainability and Cost Reduction Overview

Tricia Davis, PSB Budget Manager

Policy Guidance

- **2010 KC Strategic Plan Goals:**
 - Minimize environmental and carbon footprint of KC operations
 - Exercise sound financial management
- **2012 Strategic Climate Action Plan (SCAP)** goals, objectives, strategies, actions to:
 - Reduce greenhouse gas (GHG) emissions
 - Prepare for the effects of climate change
- **Executive Priorities**
 - Best run government: efficient with dollars and energy
 - Climate change
 - Equity and Social Justice



Did you know??

In 2013, King County spent almost \$80 million on energy!

- Over \$26 million on utilities to operate our facilities
 - Over \$22 million of this (80%+) was for electricity
- Over \$51 million on fuel for our vehicles
 - Over \$39 million (75%+) was diesel fuel
- Since 2010, our conservation efforts are saving the county over \$2.6 million per year.



Current State

- Have made progress, but can and should do more
 - Have reaped some low hanging fruit
 - But changes in costs and technology create new opportunities
- We know that there are barriers:
 - Culture and institutional practices
 - Data and analysis
 - Technical tools and guidance
 - Accountability structures
 - Cash for up-front investments
- So, as a first step, we have created the Environmental Sustainability and Cost Reduction (ESCR) Program

ESCR Program Objectives

- Achieve energy savings in support of energy and climate targets
 - Internalize energy conservation into existing operations
 - Help finance the installation of energy saving measures, including those that may not receive other incentives
- Reduce expenses
 - Make operations more resilient to rising energy costs
 - Incentivize continuous improvement and efficiencies
 - Be able to document a return on investment for energy efficiency projects
- Change our Culture: implement innovative environmental projects as a part of normal way of doing business
 - Educate employees and the public and institutionalize environmental stewardship



ESCR Program Overview

- Loan money to help agencies implement projects/ initiatives that result in energy use/cost and emission/waste reductions
- Eligible to any KC agency in 2015/2016 budget
- Loan repayment over a 10-year period
- Funding for any costs
- Projects / initiatives selected using established criteria as part of 2015/2016 budget development process
- Can propose previously appropriated/approved projects, but must go through selection process



Decision Criteria/Considerations

- **Threshold Criteria**

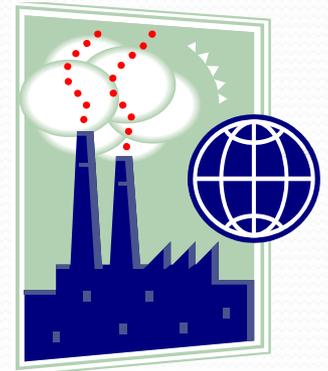
- Reduction of energy usage
- Positive Net Present Value (NPV) for energy costs
- Does not violate labor agreements/MOUs

- **Scoring Criteria**

- Reductions in energy use, GHG emissions, solid waste/ wastewater generation/water use
- NPV value, payback period, savings to investment ratio

- **Other Considerations**

- Other environmental impacts, financial benefits, labor implications
- Political feasibility and implementation risks
- Equity and Social Justice and economic development impacts
- Alignment with other KCSP goals



ESCR Application Process

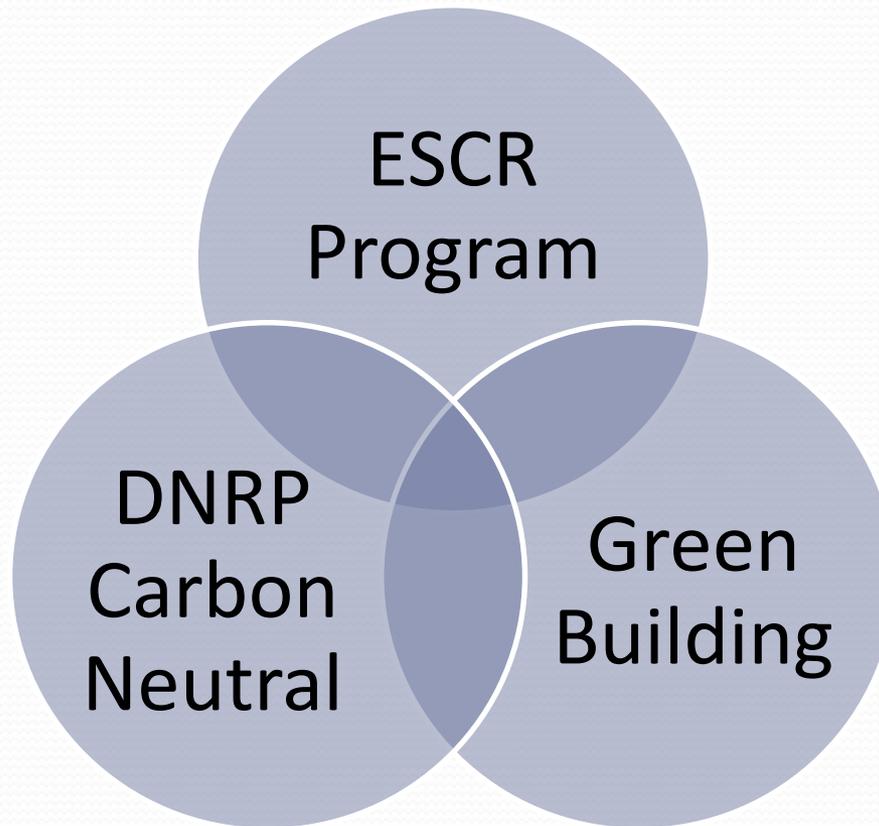
	Step Complete
Complete and Submit Project Proposal Form with the 2015/2016 Budget Request	July 3, 2014
Release Committee Reviews Proposals Against Criteria	August 1, 2014
Release Committee Recommends Projects and Loan Amounts to the Executive	August 15, 2014
Executive Makes Final Decisions on Projects and Loan Amounts	August 29, 2014
Agencies Notified of Project Selection	September 8, 2014
County Council Makes Final Budget Decisions	November 24, 2014
Funds Distributed/Available for Use	January 1, 2015

Benefits to Agencies

- Level payments over time for up front costs
- Agencies keep savings above loan repayment amount(s)
- Life Cycle Cost Analysis tool available to support analysis as well as general agency decision-making
- Provides support to projects that may not receive other incentive funding
- Supports infrastructure/equipment upgrades
- Provides avenue to tap into subject matter experts
- Makes energy project needs more visible/supports prioritization of energy/emission reduction projects

There Are Several Other KC Programs with Environmental Focus

Each individual program has its own specific requirements and goals, but they are not mutually exclusive



All of these programs require up-front planning, cost/benefit analysis, and measurement to ensure that we are getting the anticipated benefits from our investments

The bottom line: we want to invest in projects and programs that reduce the county's energy footprint

There are a number of resources available to help with the program

Budget and Business Planning Sharepoint site:

- Budget and Business Plan Instructions
- Life Cycle Cost Analysis (LCCA) Tool
- Environmental Sustainability and Cost Reduction (ESCRF) Program Evaluation Criteria
- ESCRF Proposal Form

County Energy Managers: David Broustis, DNRP; Ben Rupert, FMD

- LCCA Tool Training
- Energy Savings Opportunity Identification
- Energy Audits

Performance, Strategy, and Budget (PSB) Staff: Tricia Davis; Shelley De Wys

- Budget and Business Plan Instructions
- ESCRF Program Application Assistance

Energy Initiative Examples

David Broustis, DNRP Energy Manager

Ben Rupert, FMD Energy Manager

Examples – Lighting

- LED: (Light Emitting Diodes)
 - Quickly evolving and good for most locations
- T12 to T8/T5 linear fluorescent lamps
- Bi-level lights for stairwells and garages
- Controls
 - Daylight/photocell and occupancy sensors
 - Dimming systems for non-peak/off hours



Examples – Mechanical Systems

- Insulation above code requirements
- Heat recovery
- High efficiency “condensing”:
 - Hot water boilers
 - Gas-fired heating units
 - hot water tanks
- “VFDs” (Variable Frequency Drives) for motors and pumps
- “VRF” (Variable Refrigerant Flow) heating systems/heat pumps
- Cooling: High efficiency chillers or chilled beams



Examples – Plumbing/Vehicles

- Efficient toilets and urinals
 - 1.28 gallon per flush (gpf) toilets, 1/8 gpf urinals
- Water reuse
- Rainwater harvesting
- Drought-tolerant landscaping
- Vehicles:
 - Propane
 - Driver Training



Case Study:

North Transit Base Fans

*Scope: Air quality-based operation of garage ventilation fans.
Sensors monitor carbon monoxide and other contaminants.*

- \$1,718,193 total project cost
- \$459,759 rebate
- \$147,212/year savings
 - 2,336,697 kwh/year savings - *exceeds estimate*

8.5 year payback after rebate



Case Study:

Environmental Lab Lighting

Scope: Lighting retrofit project throughout the facility

- \$24,332 total project cost
- \$14,717 rebate
- \$5,981/year savings
 - 94,932 kwh/year savings

1.6 year payback after rebate



ESCR Potential Project Example: Orcas Fleet Maintenance Facility

Scope: Proposed retrofit to high efficiency LED lighting

Estimates

- \$34,000 cost
- \$7,000 rebate
- \$4,174/year savings
 - 34,000 kwh/year savings

6.4 year payback



ESCR Potential Project Example: Orcas Fleet Maintenance Facility

Applying for ESCR Funding: Straightforward Process

- Basic Inputs
- LCCA Tool
- Application Form
- Project Review

Orcas Fleet Maintenance Facility Lighting Upgrade		 King County	
Life Cycle Cost Analysis (LCCA) - Input - Lighting			
Status Quo or Baseline Standard		Strategy Option 1	
Status Quo or Baseline Standard - Name		Strategy Option 1 - Name	
Keep existing 250W metal halide fixtures.		Replace existing 250W metal halide fixtures with ~120W LED.	
Initial Cost (\$)	\$ -	Initial Cost (\$)	\$ 34,188
		Incremental Cost Above Baseline	\$ 34,188
		Estimate Life of Strategy (Years)	12
Annual Electricity Use (kWh)	65,520	Annual Electricity Use (kWh)	31,450
		Annual Electricity Savings (kWh)	34,070
Electricity Rate (\$ Per kWh)	\$ 0.070	Electricity Rate (\$ Per kWh)	\$ 0.070
Electricity Demand Use (kW)	69	Electricity Demand Use (kW)	58
		Electricity Demand Savings (kW)	11
Electricity Demand Rate (\$ Per kW)	\$ 2.20	Electricity Demand Rate (\$ Per kW)	\$ 2.20
Est. Annual Electricity Rate Increase (%)	5%	Est. Annual Electricity Rate Increase (%)	5%
One Time Electrical Rebate (\$)	\$ -	One Time Electrical Rebate (\$)	\$ 7,000
Annual Carbon Use (MTE)	119.25	Annual Carbon Use (MTE)	20.08
		Annual Carbon Savings (MTE)	99.18
Carbon Value (\$ per MTE)	\$ 5.00	Carbon Value (\$ per MTE)	\$ 5.00
Est. Annual Carbon Escalation Rate (%)	5%	Est. Annual Carbon Escalation Rate (%)	5%
Annual Maintenance (\$)	\$ 3,500	Annual Maintenance (\$)	\$ 840
		Annual Maintenance Savings/Cost (\$)	\$ 2,660

ESCR Potential Project Example: Orcas Fleet Maintenance Facility

Applying for ESCR Funding: LCCA Tool

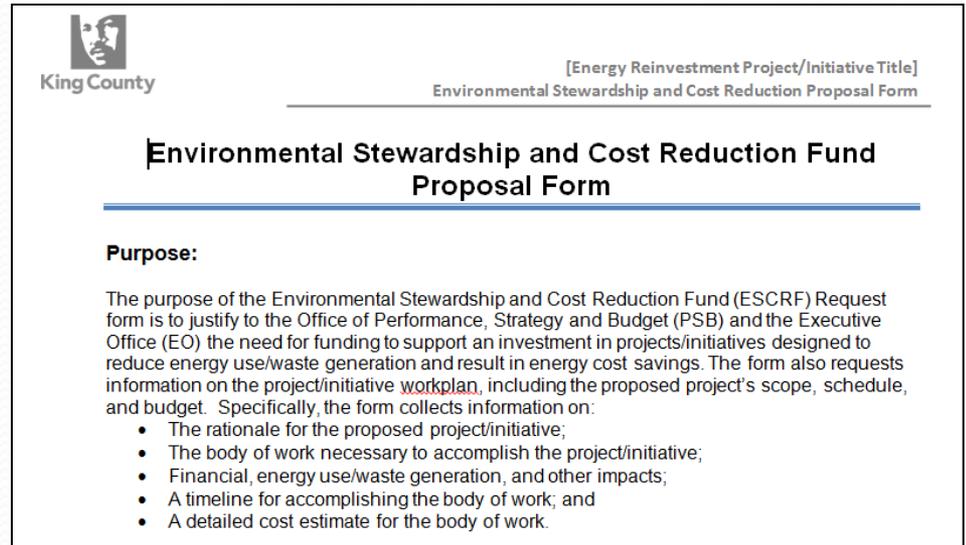
- Based on inputs, LCCA tool provides a project summary detailing all critical financial data

 King County		Strategy Option 1 - Name		
				Replace existing 250W metal halide fixtures with ~120W LED.
		Simple Payback (Years)	6.4	
		Equivalent Net Present Value (NPV) (\$)	\$ 56,822	
		Savings to Investment Ratio	1.66	
		Internal Rate of Return (IRR) (%)	18.94%	
Financials	Project Initial Cost (\$)	\$	34,188	
	Annual Equivalent Payment (\$)	\$	6,125	
	First Year Resource Savings (\$)	\$	2,675	
	First Year Non-Resource Savings/Cost (\$)	\$	2,660	
	Project Life Net Present Value (NPV) (\$)	\$	56,822	
	Present Value (PV) (\$)	\$	56,822	
	Adjusted Internal Rate of Return (AIRR) (%)		7.45%	
	GHG	Electricity Use Savings (kWh)		34,070
		Electricity Cost Savings (\$)	\$	2,675
		Total Utility Cost Savings (\$)	\$	2,675
Carbon Use Savings (MTE)			21.8	
Carbon Cost Savings (\$)		\$	-	
NPV Sensitivity Analysis		Discount Rate	Discount Rate	
		- 2%		
		\$ 64,394	\$ 56,822	

ESCR Potential Project Example: Orcas Fleet Maintenance Facility

Applying for ESCR Funding: ESCR Application Form

- Form allows applicant to provide additional project details and rationale for investment
- Form is intended to be brief and provide critical information only



The image shows a thumbnail of the 'Environmental Stewardship and Cost Reduction Fund Proposal Form'. At the top left is the King County logo, which includes a portrait of a person and the text 'King County'. To the right of the logo is a placeholder for the project title: '[Energy Reinvestment Project/Initiative Title] Environmental Stewardship and Cost Reduction Proposal Form'. Below this is a horizontal line, followed by the title 'Environmental Stewardship and Cost Reduction Fund Proposal Form' in a bold, sans-serif font. Underneath the title is another horizontal line. The section is titled 'Purpose:' and contains a paragraph explaining that the form is used to justify funding to the Office of Performance, Strategy and Budget (PSB) and the Executive Office (EO) for projects designed to reduce energy use and waste. It also lists four specific pieces of information the form collects: the rationale for the project, the body of work, financial and energy/waste impacts, a timeline, and a cost estimate.

 King County

[Energy Reinvestment Project/Initiative Title]
Environmental Stewardship and Cost Reduction Proposal Form

Environmental Stewardship and Cost Reduction Fund Proposal Form

Purpose:

The purpose of the Environmental Stewardship and Cost Reduction Fund (ESCRF) Request form is to justify to the Office of Performance, Strategy and Budget (PSB) and the Executive Office (EO) the need for funding to support an investment in projects/initiatives designed to reduce energy use/waste generation and result in energy cost savings. The form also requests information on the project/initiative workplan, including the proposed project's scope, schedule, and budget. Specifically, the form collects information on:

- The rationale for the proposed project/initiative;
- The body of work necessary to accomplish the project/initiative;
- Financial, energy use/waste generation, and other impacts;
- A timeline for accomplishing the body of work; and
- A detailed cost estimate for the body of work.

Barriers to Investment

Rhonda Berry, Assistant Deputy County Executive



Small Group Discussions



Thank you!

Energy Goals

- **2010 King County Energy Plan:**
 - By 2015
 - 15% reduction in energy use in KC buildings
 - 10% reduction in energy use in vehicles
 - By 2012 – Produce/use/procure renewable energy = 50% of total County energy requirements
- **2012 King County Strategic Climate Action Plan (SCAP):**
 - Partner with stakeholders to reduce countywide greenhouse-gas emissions by 80% below 2007 levels by 2050
 - Reduce greenhouse-gas emissions compared to a 2007 by:
 - 15 percent by 2015
 - 25 percent by 2020
 - 50 percent by 2030