

# Energy Usage By and Within King County: Status and Trends

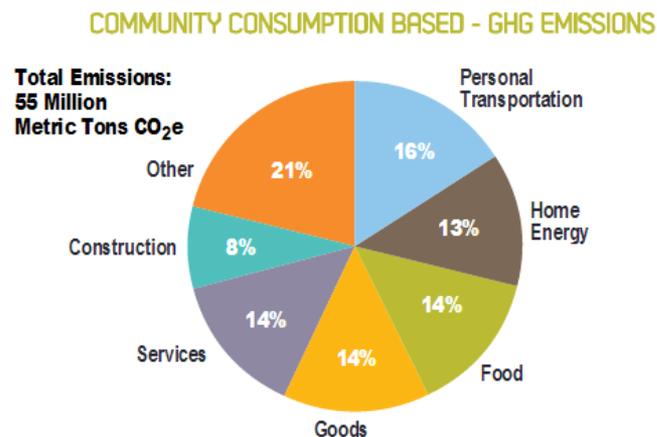


*David Broustis*  
*DNRP Energy Manager*



# 2015 SCAP Snapshot

- ***Transportation and building energy use are the biggest drivers of GHG emissions***
- ***Direct correlation between energy use and GHG emissions***
- **Countywide building electricity/natural gas use:**
  - Down 6.4% between 2012 and 2015
    - Milder weather and efficient operations



From *Greenhouse Gas Emissions in King County, 2012*.

# County Government Drivers for Reductions

- **2015 Strategic Climate Action Plan (SCAP)**
    - Reduction goals, baseline 2014:
      - Buildings: 5% by 2020, 5% more by 2025
      - Vehicles: 10% reduction by 2020
      - Water: 5% by 2020, 5% more by 2025
    - Reduce greenhouse gas (GHG) emissions
  - **King County Strategic Plan Goals:**
    - Minimize environmental and carbon footprints of KC operations
    - Exercise sound financial management
  - **Executive Priorities**
    - Best run government: efficient with dollars and energy
    - Climate change
    - Equity and Social Justice
    - Regional Mobility
- 

# Did You Know...

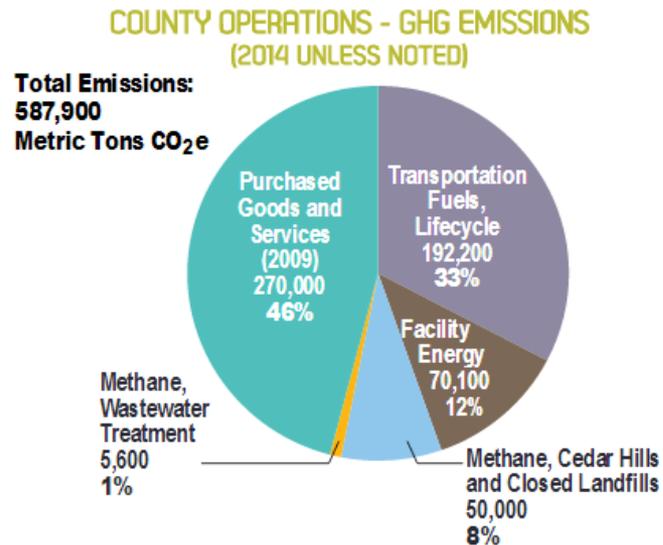
**In 2015, King County government spent almost \$60 million on energy!**

- ▶ \$28 million on utilities to operate our facilities
  - 80%+ was for electricity
- ▶ \$31 million on fuel for our vehicles
  - 75%+ was diesel fuel
- ▶ Since 2010, our building conservation efforts alone are saving the county over \$3.2 million per year.



# Government Transportation Energy Use

- **KC government normalized energy use, baseline 2014:**
  - 1.8% increase for non-Transit county fleets
  - 2.6% reduction for Transit
    - Normalized by boardings



From *Greenhouse Gas Emissions in King County, 2012*.

# Government Building Energy Use

## 2016 Second Quarter King County Building Energy Update

\*Source Energy Use

Green = down 5% or more. Red = up 5% or more.

**5% Goal by 2020, baseline 2014**



King County

MMBTU = Millions of British Thermal Units. One BTU is approximately the amount of energy given off by one match.

Department	Division/Department	Normalization	July 2015 - June 2016 Energy Use	Energy Use Calendar Year 2014	Modified Baseline Energy Use (normalized)	2014 vs. 7/'15-6/'16 Raw Use % change	2014 vs. 7/'15-6/'16 Normalized Use % change
DNRP	Parks & Recreation	BTU/HDD	66,555	72,823	72,256	-9%	-7.9%
	Solid Waste*	BTU/HDD	76,124	78,819	78,528	-3%	-3.1%
	Wastewater Treatment Division	Weather & Flow	2,038,163	2,036,951	2,073,081	0.1%	-1.7%
	Water & Land Resources	BTU/HDD	29,790	28,116	27,925	6%	6.7%
<i>DNRP Subtotal</i>			<i>2,210,632</i>	<i>2,216,709</i>	<i>2,251,790</i>	<i>-0.3%</i>	<i>-1.8%</i>
DOT	King County Airport	BTU/HDD	25,111	24,915	24,770	1%	1.4%
	Metro Transit	BTU/HDD	328,570	370,904	369,410	-11%	-11.1%
	Road Services	BTU/HDD	36,725	37,614	37,177	-2%	-1.2%
<i>DOT Subtotal</i>			<i>390,406</i>	<i>433,433</i>	<i>431,357</i>	<i>-10%</i>	<i>-9.5%</i>
DES / FMD Managed	Adult & Juvenile Detention	BTU/HDD	262,473	263,493	263,319	-0.4%	-0.3%
	District Court	BTU/HDD	119,021	130,735	130,461	-9%	-8.8%
	General Office Administration	BTU/HDD	131,233	132,787	132,115	-1%	-0.7%
	Public Health	BTU/HDD	30,166	28,083	28,020	7%	7.7%
	Sheriff's Office	BTU/HDD	22,760	21,243	21,183	7%	7.4%
<i>DES/FMD-Managed Subtotal</i>			<i>565,653</i>	<i>576,341</i>	<i>575,098</i>	<i>-2%</i>	<i>-1.6%</i>
Other	Fleet Administration Orcase Bldg (managed by FMD)	BTU/HDD	3,215	3,448	3,420	-7%	-6.0%
	Kent Animal/Archives/Records & Elections	BTU/HDD	7,229	7,947	7,891	-9%	-8.4%
	DCHS: Dutch Shisler Sobering Center	BTU/HDD	3,766	3,567	3,567	6%	5.6%
<b>County Energy Use Totals</b>			<b>3,180,901</b>	<b>3,241,445</b>	<b>3,273,123</b>	<b>-1.9%</b>	<b>-2.8%</b>

### Wastewater Treatment Division Energy Environmental Footprint combining energy use and renewable energy production

WTD Energy Footprint		Normalization	July 2015 - June 2016 Energy Use	Energy Use Calendar Year 2014	Modified Baseline Energy Use (normalized)	2014 vs. 7/'15-6/'16 Raw Use % change	2014 vs. 7/'15-6/'16 Normalized Use % change
Combined energy use and renewable energy production		Weather & Flow	1,800,478	1,767,365	1,800,621	1.9%	0.0%

# What is Driving the Energy Outcomes

## Transportation

- *What:* Vehicle fuel efficiency
- *How much:* Vehicle Miles Traveled

## Buildings

- Energy codes
  - Buildings, and equipment/appliances
- (milder) Weather

population

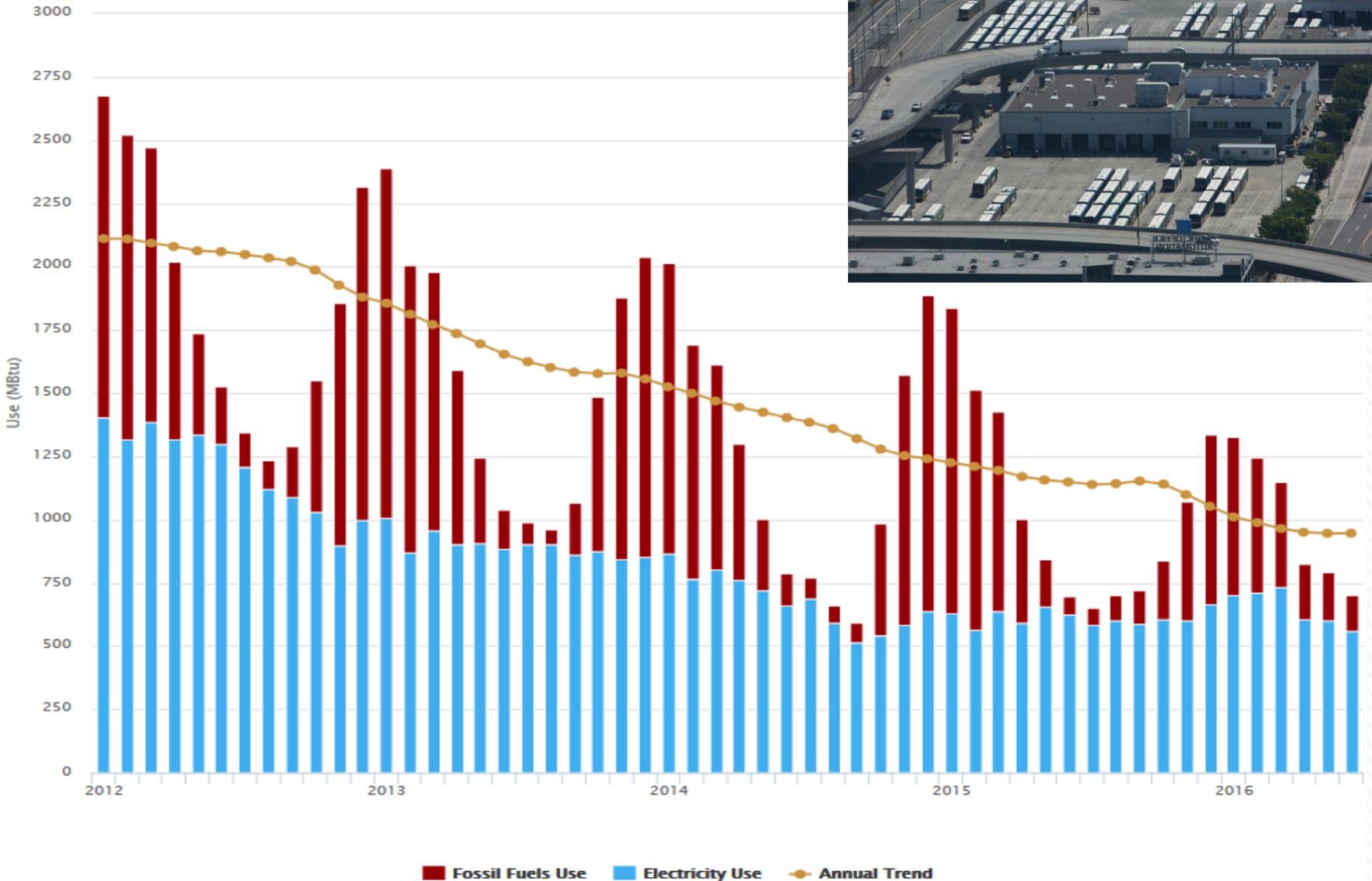


**Building Energy Use:**  
*Reasons to be Optimistic...*

# North Transit Base

56% reduction since 2012 Energy Use Trend

North Base -- 01/2012 to 06/2016



# Doing the same work with less energy



**Incandescent**



**CFL**



**Philips LED**



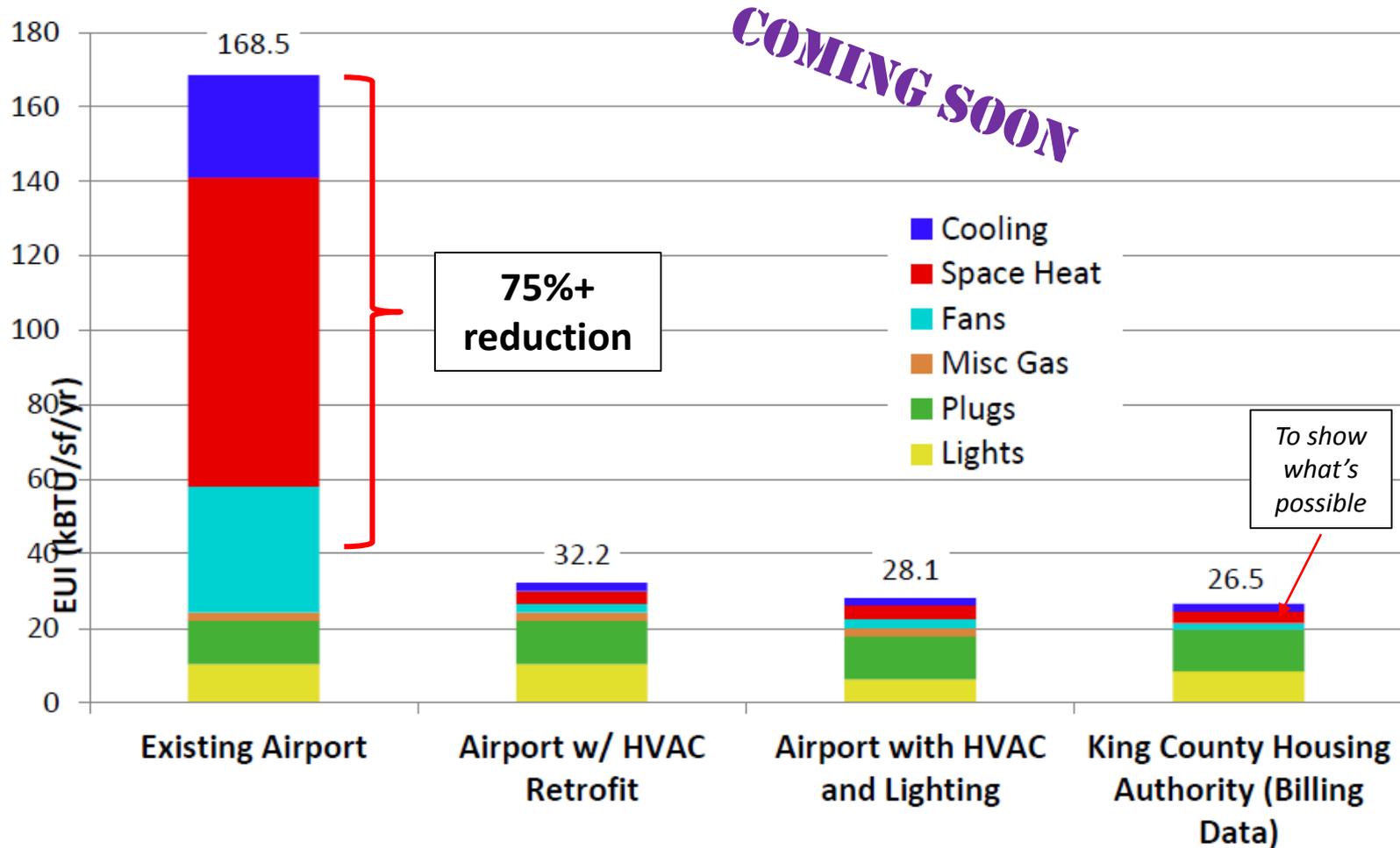
**Cree LED**

# Case Study: Environmental Lab

- ▶ Lamp retrofit: replacement of fluorescent lamps to LED
  - 32 watt lamps to 18 watts
- ▶ Project Summary
  - \$66,377 cost
  - \$17,995 rebate
  - 90,657 kWh/year savings
    - \$5,711/year
  - **8.5 year payback**
    - Lights will last over ten years without maintenance



# Airport Terminal Deep Retrofit



**Looking ahead...**

# Renewable Energy

## Optimized production of Renewable Energy

- Wastewater biogas/landfill gas
  - Biomethane
  - Gas-to-Electricity
- Solar



## Consuming Renewable Energy

- Wastewater biogas
  - Wastewater Pumping
  - Facility Heating
- Transportation biofuels
- Green power purchases



# Trends: Transportation

## Countywide

- Expansion of rail and non-SOV mobility options will continue to increase (ST3?) ...but so will population
- More efficient vehicles
- Electrification of the sector
  - ...will offer GHG and energy reduction benefits, but the rate of transformation will dictate how quickly we see positive outcomes
- **Greater emphasis on GHG than energy consumption?**

## Government

- Efficient vehicles
  - Greater electrification for buses?
- Clean fuels



# Trends: Building Energy Use

## Countywide

- Energy codes, progressively getting more stringent
- Utility efficiency program growth
- Climate change: milder winter weather

...all will limit building energy use growth, but offset by:

- Increased population
- Increased summer cooling loads

## Government

- Investments toward 2020 and 2025 reduction goals
  - DNRP commitment to go all LED by 2018
    - 40-60% reductions for lighting-related energy

# Questions

