



# Wastewater Treatment Division (WTD)

## Resource Recovery

*Harnessing Valuable Resources that would otherwise be lost.*

# WTD RESOURCE RECOVERY MISSION

We bring valuable resources, technology, and sound business practices **together** to deliver products and programs that inspire our communities to be part of an environmentally sustainable future—today.

*Harnessing valuable resources that would otherwise be lost.*



- PRODUCTS & SERVICES DELIVERY SUPPORT**
- Business Strategy & Formation
  - Policy Development
  - Marketing & Communication
  - Education & Community Engagement
  - Project Management



**PRODUCTS & SERVICES**

- PROGRAMS**  
Manages products and services delivery:
- Recycled Water
  - Biosolids
  - Energy
  - Sustainability
  - Technology Assessment

**King County** | Resource Recovery

**PRODUCTS**

recycledwater loop

BIOGAS

SEWERHEATRECOVERY  
A King County renewable clean energy resource

**DIRECT CUSTOMERS (external)**

- Forest
- Farm
- Electric Utilities
- Commercial Property Owners



**SERVICES**

Informs decision making that impacts WTD's resource recovery and its future:

- Technology Assessment
- Research
- Sustainability Leadership
- Energy Guidance
- Program Development

**INTERNAL CUSTOMERS**

- Capital Projects
- Operations
- WTD Leadership



This information can also be viewed online [HERE](#).



King County  
Department of Natural Resources and Parks  
Wastewater Treatment Division  
Resource Recovery Section  
400 Stone Center, 425-466-0112  
200 South 34th Street, Seattle

**Technology Assessment Program  
New Technology Preliminary Evaluation Form**

Vendor/Proposer: Flux Drive®

Technology: Magnetic Induction Drive and Coupling

**General Information**

1. Vendor	Flux Drive®
2. Contact Person	Matthew Carlson
3. Phone	253-826-9002 ext 714
4. Email	mcarlson@flux-drive.com
5. Website	<a href="http://www.flux-drive.com">www.flux-drive.com</a>
6. Date of initial contact	April 16, 2013
7. Technology Category (e.g. Solids, Energy)	Energy
8. Coordinate with (e.g. SP, Energy Program)	Energy Program, South Plant

**Brief Description of Technology/Proposal:**

Flux Drive® technology utilizes induction motor theory and permanent magnets to provide soft start capabilities and adjustable speed drives (ASD). With the magnetic coupling, torque is transferred across an air gap by means of magnetic induction. The magnetic coupling eliminates high peak power demands during start-up and provides significant energy savings during reduced speed operations. Flux Drive® allows the motor to run at a constant speed while having the ability to provide speed control to the load. The magnetic drive technology eliminates the direct connection of the motor to the load which Flux Drive® claims provides significant advantages over other coupling and drive technologies. Reported advantages include reduced vibration and noise, elimination of harmonic

CREATING RESOURCES FROM WASTEWATER



Innovative Treatment Process Testing

Technology Proposal Review

Planning and Capital Programs Project Support

Alternatives Evaluation

Design Review

Commissioning

Treatment Plant Process Group Support

Optimization

Troubleshooting

Applied Research Participation

University of Washington Graduate Fellowship Program

Water Research Foundation Projects



**Technology Assessment Program**

# SCOPE OF WORK

*Harnessing valuable resources that would otherwise be lost.*

## Current Projects

- Assisting Department of Health and CDC with sampling for Sewer Surveillance
  - COVID tracking
- Evaluating technologies:
  - Nutrient removal
  - PFAS reductions
  - CEC reductions
- Piloting:
  - Brightwater Aeration Basin Optimization (BWABO)



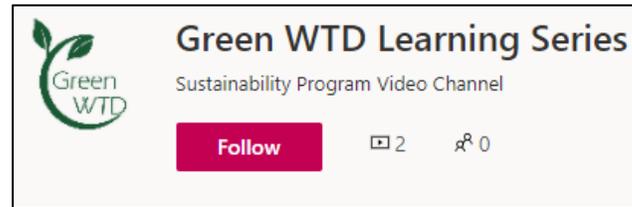
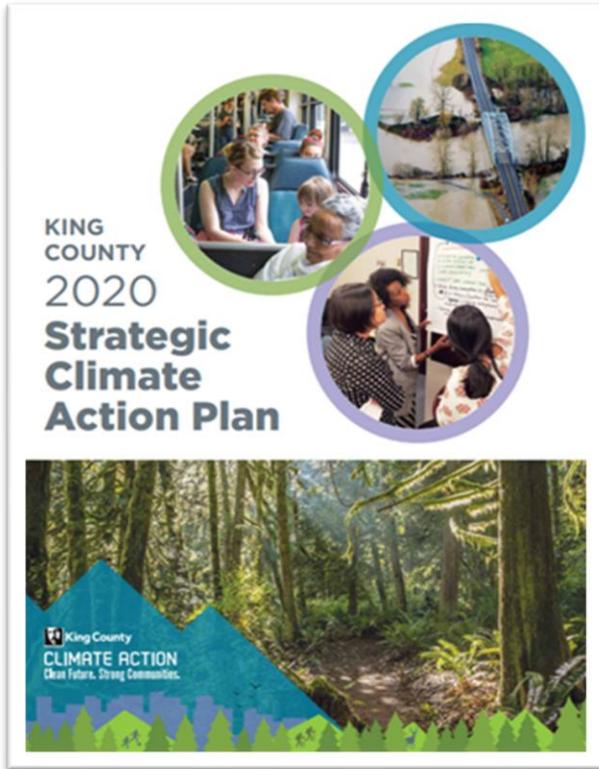
## Supports Green Building and Sustainable Development Plans

### Goals:

- Reduce greenhouse gas emissions
- Reduce pollution
- Reduce the use of natural resources
- Reduce energy and other operating costs
- Enhance asset value
- Optimize performance
- Promote cultural sustainability

# **KING COUNTY ORDINANCE 17709** ***SUSTAINABILITY***

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## Guide WTD efforts to integrate sustainability practices in all facets of its operations:

- Developing and implementing sustainability policies
- Advancing sustainable infrastructure in the capital improvement program
- Promoting sustainable operations
- Building an internal culture of sustainability

## Sustainability Program

# SCOPE OF WORK

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**Operational Efficiency Improvement Resource**



**Planning & Capital Project Support**



**Technical Standards, Specifications, & Design Guidelines**



**Efficiency & Renewables - Revenues & Financial Incentives**

**Energy Program**

# **SCOPE OF WORK**

## Results

- \$8.2 Million Renewable Gas Revenue (South Plant)
- 2.6 Million Therms Renewable Natural Gas Sold (South Plant)
- \$950K Million Renewable Electricity Revenue (West Point)
- 12.7 Million kWh (kilowatt-hours) Renewable Electricity Sold (West Point)



# Example

## Example

- Brightwater Aeration System Upgrade using LEAPmbr Technology
- In early 2019, Brightwater began upgrading its existing aeration system to LEAPmbr membrane technology
- The LEAPmbr project was funded entirely by revenue generated from selling renewable natural gas from South Plant
- estimated to save Brightwater over 2-million kilowatt-hours of electricity every year
- We were awarded a \$350,000 performance incentive by SnoPUD

## REAL SAVINGS

To date, the upgrade has **saved WTD 4.8 million kWh of electricity**. This equals the greenhouse gas emissions (GHG) of about 8,549,085 miles driven by an average passenger car. So far, the **project has also saved WTD \$380,000** in electrical costs.

## **RWSP**

Continue producing reclaimed water

Coordinate with water suppliers, regulators and interested parties

Evaluate and explore future opportunities

Explore satellite treatment plants

## **County Code**

28.86.100 – Water Reuse Policies

The water reuse policies are intended to guide the county in continuing to develop its program to produce reclaimed water.

# **REGIONAL WASTEWATER SERVICES PLAN (RWSP)** ***RECYCLED WATER***



Recycled Water Program

# SCOPE OF WORK



**Recycled Water Program**

## **CUSTOMERS AND STAKEHOLDERS**

### **Wholesale and Retail Recycled Water Customers**

- City of Tukwila
- Starfire Sports
- Willows Run Golf Course
- 60 Acres Park
- Buttonwood Tree Farm
- Fill Station (i.e., Metro, WLRD)
- Chinook Bend Wetland (Wild Fish Conservancy, Snoqualmie Tribe)
- Potential new customers

### **Partners and collaborators**

- WTD Operations
- Ratepayers
- WA Departments of Ecology and Health
- Tribal Governments
- Local Water Utilities
- MWPAAC
- Environmental Organizations
- KC Agriculture
- Washington Water Trust
- WRIAs

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## Recycled Water Demonstration

- Located in the Sammamish Valley – Hollywood Pump station
- Evaluate perceptions and address concerns about RW safety
- Reduce reliance on the river for crop irrigation
- Evaluated Chemicals of Emerging Concern (CEC)
- Built raised garden beds
- Watered with Recycled water and river water
- Only variable was the water – all other aspects of the demonstration were the same.
- Final report is being written and will be released later this year.



# RWSP

## Evaluate new technologies:

Ensure the county's solids handling technologies best meet the criteria of product quality (Class A or B)

- Marketability
- Noise
- Odor
- Rate impacts
- Reliability of the treatment process
- Amount of land needed for the treatment facility
- Number of truck trips needed to transport the biosolids

## County Code:

28.86.090 – Biosolids Policies

The biosolids policies are intended to guide the county to continue to produce and market class B biosolids. The county will also continue to evaluate alternative technologies to produce the highest quality marketable biosolids. This would include technologies that produce class A biosolids.

# **REGIONAL WASTEWATER SERVICES PLAN (RWSP)**

## ***BIOSOLIDS***

*Harnessing valuable resources that would otherwise be lost.*



Agricultural Program



Forestry Program

## Biosolids Program

# SCOPE OF WORK



Transportation Program



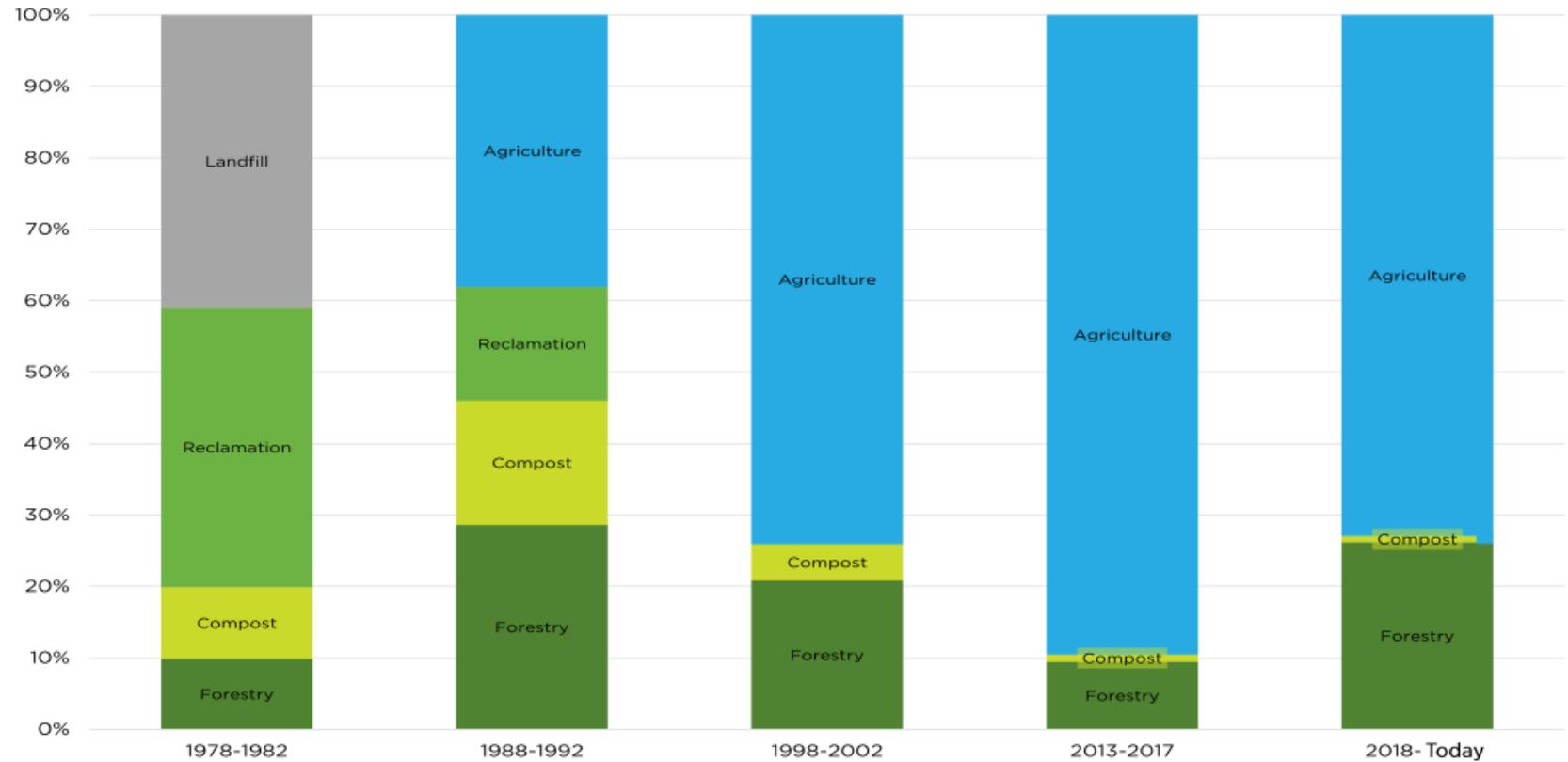
Compost Pilot



Reclamation Project

# Historic Biosolids Distribution

Biosolids Program Lifetime Distribution and Diversity



**Program Implications**

**Landfill Diversion**

- Forestry application began
- Land reclamation application at high rates
- Compost partnership with private business formed

**Program Implications**

**Maximum Diversity**

- Agricultural application in Eastern Washington began
- Forestry application expanded
- Land reclamation application continued
- Compost partner production expanded
- 100% beneficial use

**Program Implications**

**Agricultural Expansion**

- Agricultural application in Eastern Washington rapidly expanded
- Forestry application decreased
- Compost partner production decreased
- Land reclamation application ended

**Program Implications**

**Narrowing Options**

- >90% product applied on agricultural land in Eastern Washington
- Forestry application sharply decreased
- <1% product used for compost partner production

**Program Implications**

**Recovering, But Vulnerable**

- 65% of product applied on agricultural land in Eastern Washington
- Forestry application at historic highs
- Compost partner closed business in 2020 and ended compost production
- Application sites currently robust, but narrow and vulnerable to climate change impacts.

This information can also be viewed online [HERE](#).



# Diversifying the Biosolids Program

## Piloting:

Develop a King County biosolids compost product

## Exploration:

Reclamation



# QUESTIONS?

**Rebecca Singer**

[Rebecca.Singer@kingcounty.gov](mailto:Rebecca.Singer@kingcounty.gov)