WTD Resource Recovery

Harnessing Valuable Resources that would otherwise be lost.

King County | Resource Recovery

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.

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SUPPORTS PRODUCTS AND SERVICES DELIVERY

- Business Strategy & Formation
- Policy Development
- Marketing & Communication
- Project Management

PRODUCTS & SERVICES

PROGRAMS

Manages products and services delivery:

- Recycled Water
- Biosolids
- Energy
- Sustainability
- Technology Assessment

PRODUCTS

recycledwater

loop

BIOGAS

SEWERHEATRECOVERY
A King County renewable clean energy resource

DIRECT CUSTOMERS (external)

- Forest
- Farm
- Electric Utilities
- Commercial Property Owners

COMMUNITY

SERVICES

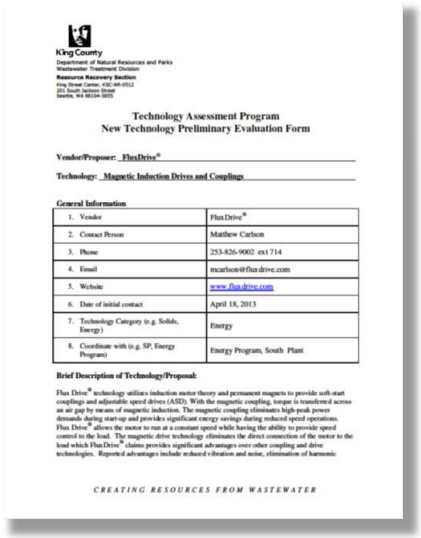
Informs decision making that impacts WTD's resource recovery and its future:

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

INTERNAL CUSTOMERS

- Capital Projects
- Operations
- WTD Leadership

SAVINGS



King County
Department of Natural Resources and Parks
Wastewater Treatment Division
Resource Recovery Section
King Street Center, KSC-NR-0512
201 South Jackson Street
Seattle, WA 98104-3855

Technology Assessment Program
New Technology Preliminary Evaluation Form

Vendor/Proposer: FluxDrive®

Technology: Magnetic Induction Drives and Couplings

General Information

1. Vendor	FluxDrive®
2. Contact Person	Matthew Carlson
3. Phone	253-826-9002 ext 714
4. Email	mcarlson@fluxdrive.com
5. Website	www.fluxdrive.com
6. Date of initial contact	April 18, 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 couplings 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

Technology Assessment Program

SCOPE OF WORK

- 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

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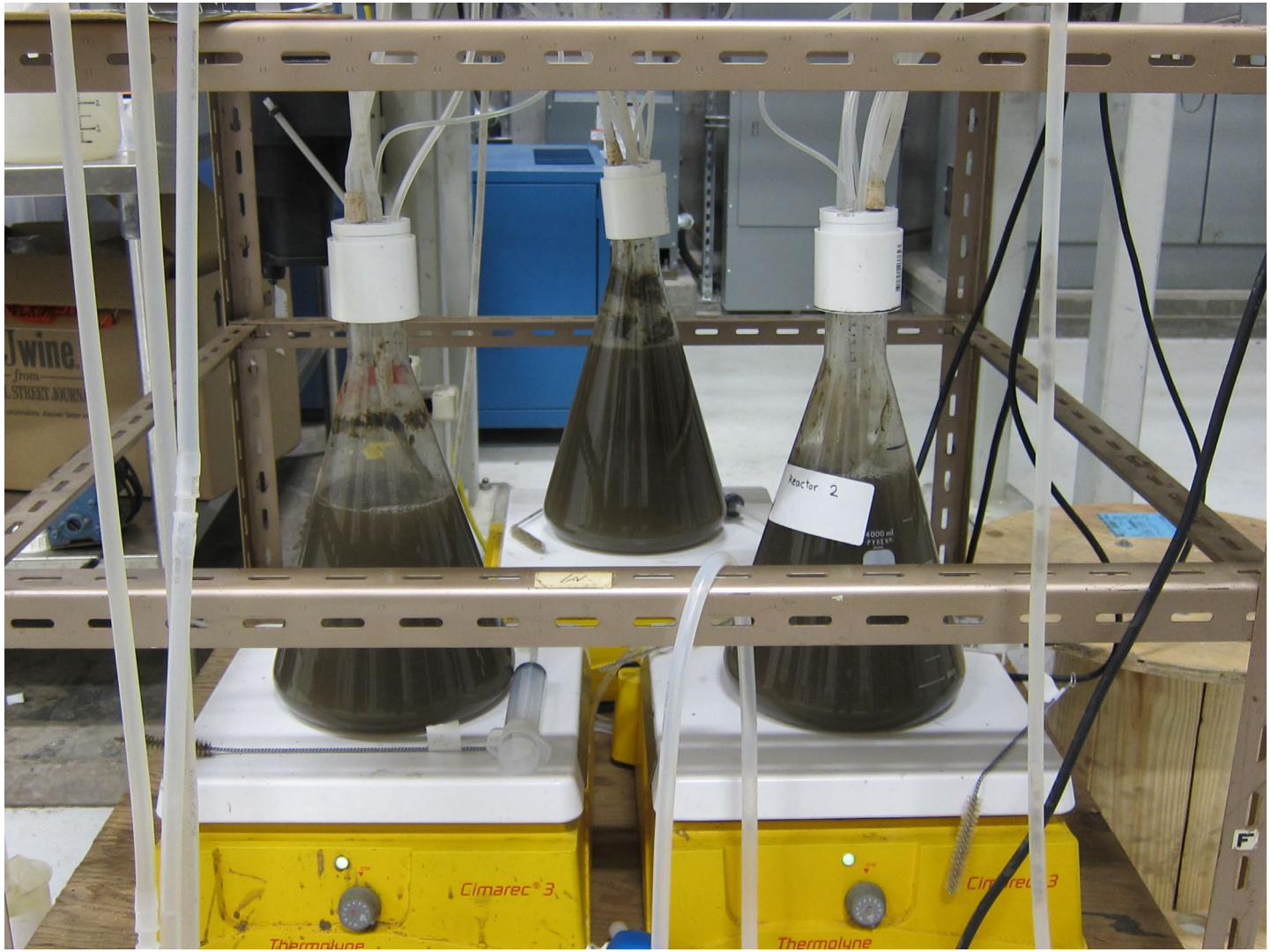
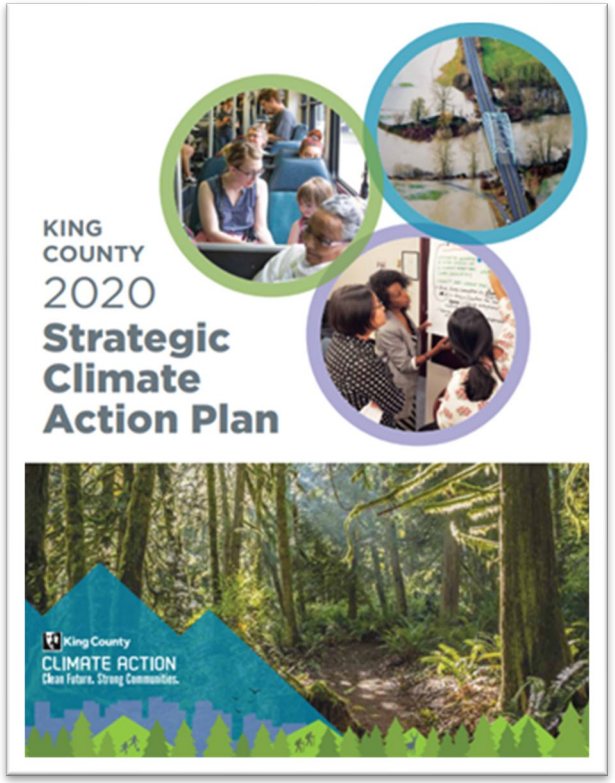
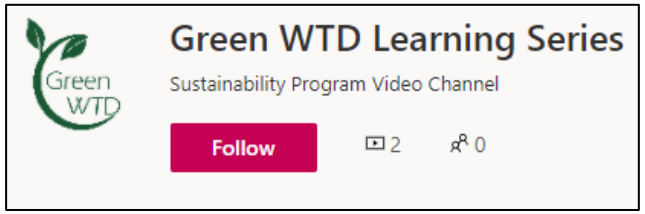
Current Projects

- 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)







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

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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.

Recycled Water Program

SCOPE OF WORK

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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 Tri
- 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.

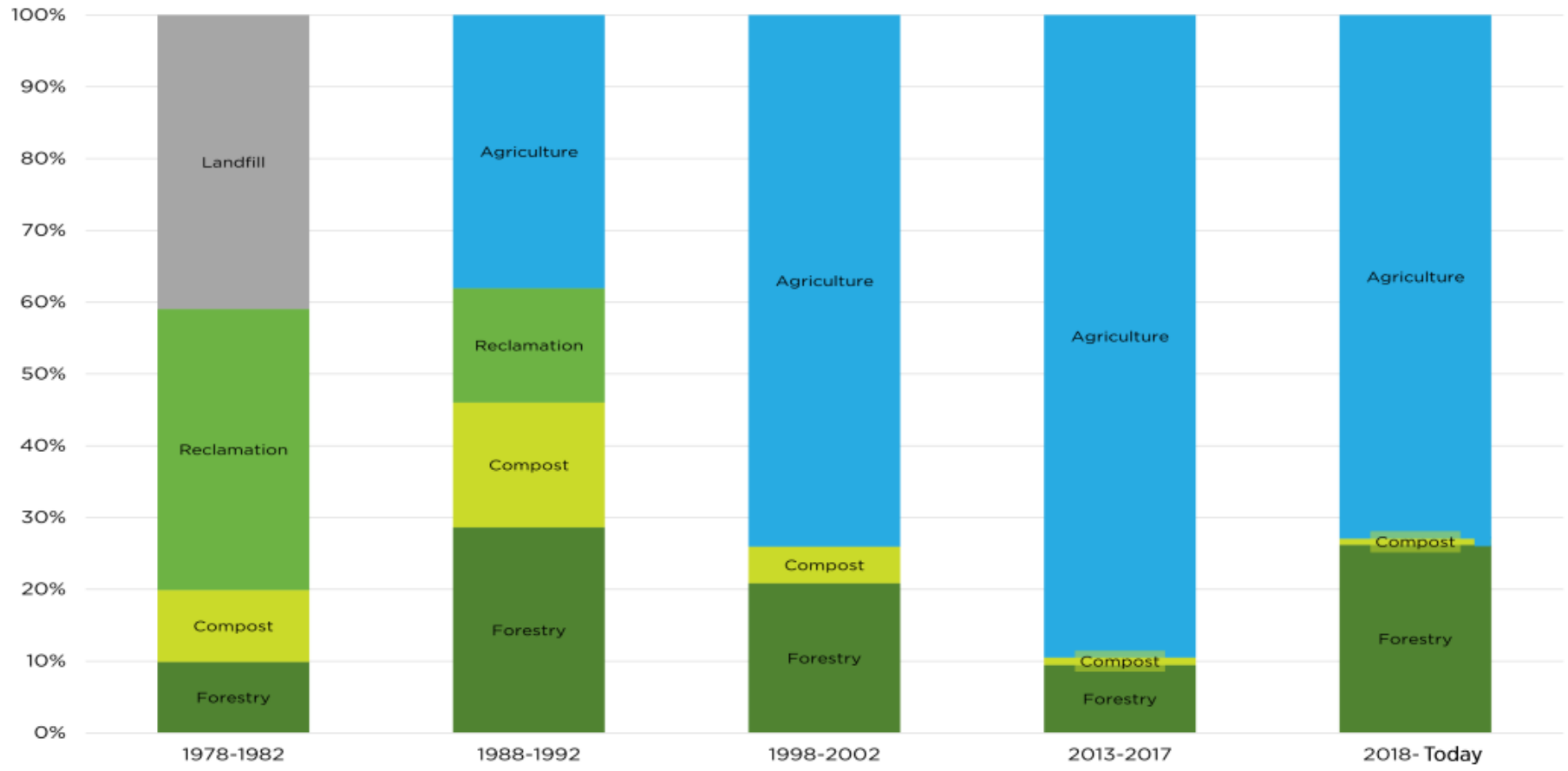
Biosolids Program

SCOPE OF WORK

Transportation Program

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.

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Diversifying the Biosolids Program

Piloting:

Develop a King County biosolids compost product

Exploration:

Reclamation

QUESTIONS?

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