

Resource Recovery and Residual Waste Management

Squamish Lillooet Regional
District
May 14, 2014



MORRISON HERSHFIELD

Topics Covered

1. 4th R – Resource Recovery
2. 5th R – Residual Waste Management
 - Landfills and transfer stations
3. Waste export
4. Waste flow, flow control and First Nations
5. Regional challenges and options
6. Decision-making criteria

Disposal and Diversion

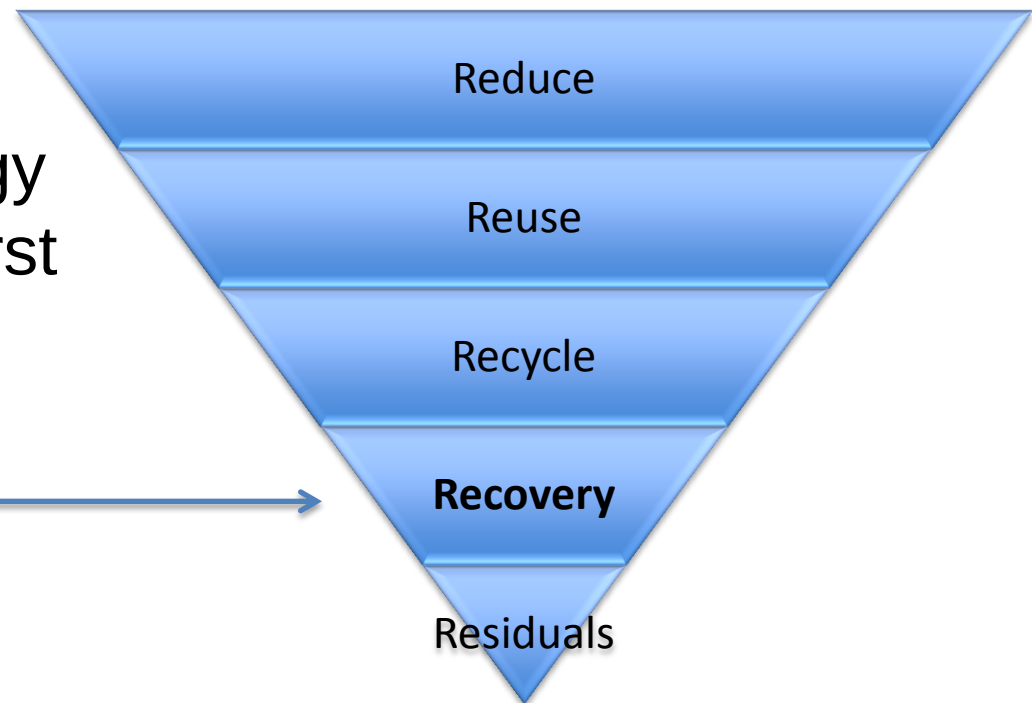
- Total disposal = 27,000 tonnes (2012)
 - 11,700 – Squamish Landfill
 - 12,800 – Rabanco Landfill via Whistler Transfer Stn.
 - 2,500 – Lillooet Landfill
- Total diversion = 20,100 tonnes (2012)
- Diversion rate = 43%

Key Issues and Challenges

- Squamish Landfill – 4 years of capacity
 - District has applied to expand the landfill
 - May not go ahead
- Not short term options
 - Resource recovery
 - New regional landfill
- Feasible short and long term options include out-of-region facilities
- New landfill guidelines could impact Lillooet Landfill

Resource Recovery

- 4th R - Recovery of energy and materials after the first 3Rs, prior to disposal



Resource Recovery

- Recovery of energy embodied in the waste
 - Thermal energy
 - Biological energy
- Recovery of non-energy resources
 - Recyclables
 - Organics

Mixed Waste Materials Recovery Facility

- Mechanical equipment used for removing recyclables
- Proven technology
- Being considered in other regions
- Considerations: economy of scale, value of recyclables, existing programs



<http://www.youtube.com/watch?v=z5wJpBhaZtY>

Anaerobic Digestion

- Organic component of waste digested
- Biogas used to make electricity and heat, or fuel
- Proven technology
- Considerations: economy of scale, end-users, value of electricity / fuel



<http://www.biocycle.net/2012/03/14/anaerobic-digestion-in-the-northwest/>

Refuse Derived Fuel (RDF)

- Process waste into fuel for use by industry
- Proven technology
- Considerations: economy of scale, potential energy, end-markets



Bio-drying

- Variation on composting
- Compost technology used to dry waste
- Dried waste used as a fuel by industry
- Trials being undertaken at RMOW composter
- Considerations: cost-benefit, end-markets



Waste-to-energy

- Conventional “mass burn” - produce electricity and heat - proven
- Advanced thermal technologies
 - Gasification
 - Pyrolysis
- Considerations: economy of scale, proven technology, value of energy



<http://www.wheelabratortechnologies.com/plants/waste-to-energy/wheelabrator-spokane-inc/>

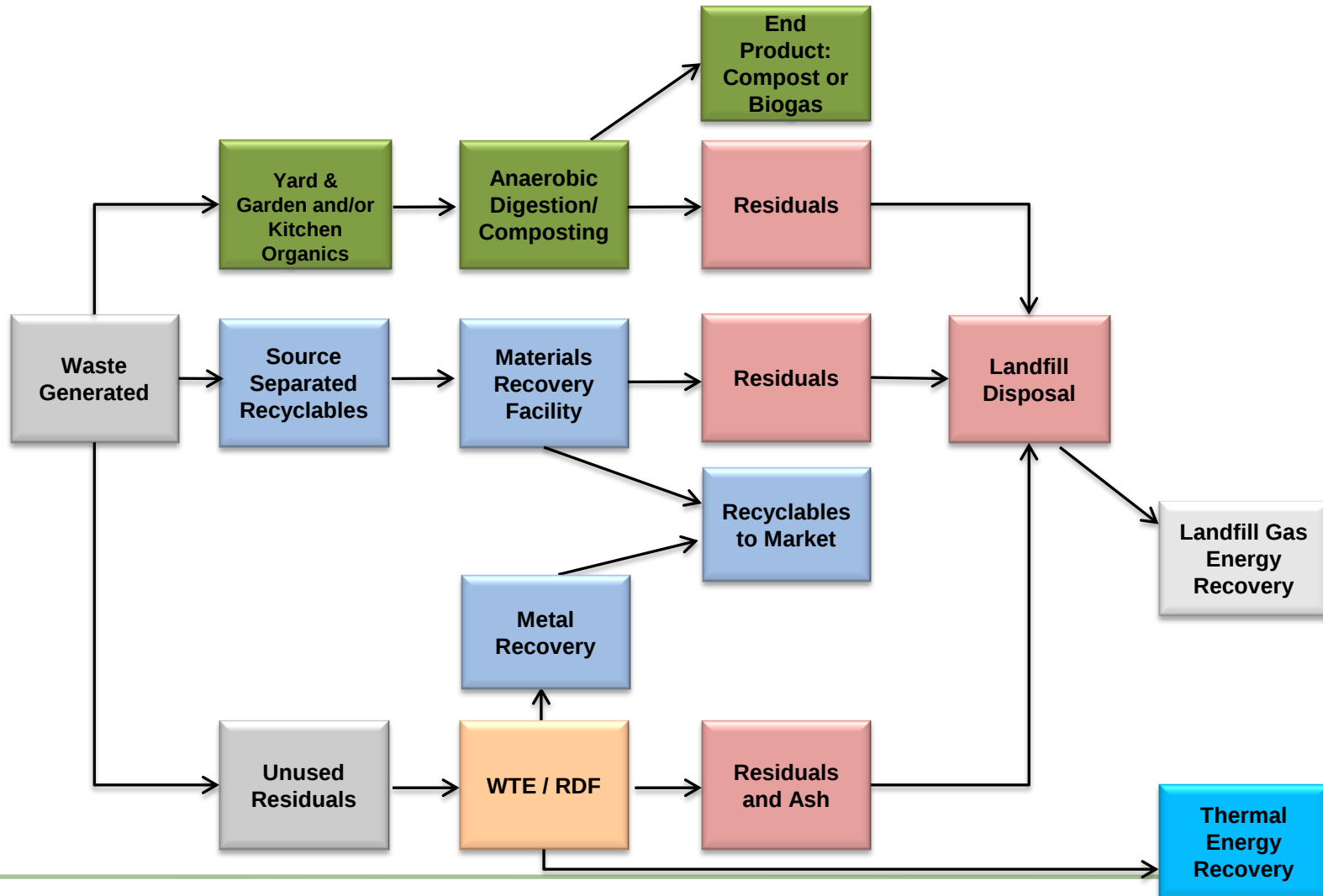
Landfill gas capture - energy

- LFG captured for energy or to reduce greenhouse gas emissions
- Proven technology
- Considerations: gas generation, cost-benefit, greenhouse gas emissions reductions



Source: Capital Regional District

Integrated System



Applications in Canada

- Two commercially operating anaerobic digestion systems – Toronto and Vancouver
- Many landfill gas to energy plants
- Waste-to-energy
 - Burnaby – 200,000 tonnes per year
 - Quebec City – 280,000 tonnes per year
 - Algonquin Peel – 150,000 tonnes per year
 - Durham / York – 140,000 tonnes per year
- Three regions currently pursuing WTE

Applications in SLRD

- Use of waste heat at RMOW compost facility
- Whistler and Squamish wood to Howe Sound Pulp and Paper
- RMOW investigating bio-drying
- RMOW landfill gas flared

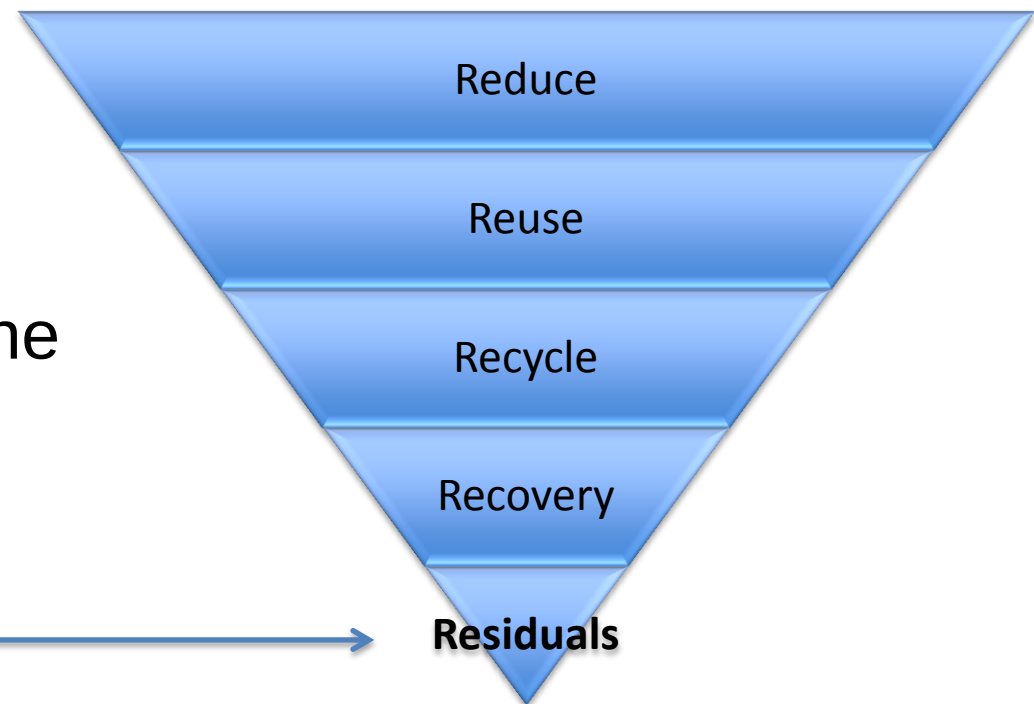


Resource Recovery Summary

- Recovery of energy, recyclables or organics
- Technologies
 - Materials recovery facilities
 - Refuse derived fuel
 - Anaerobic digestion
 - Bio-drying
 - Waste-to-energy
 - Landfill gas capture / use

Residual Waste Management

- 5th R - Final treatment or disposal of waste that cannot be managed by the other 4 Rs



Residuals Management - Landfills



Source: Capital Regional District

Value of a Landfill

- Will always need some landfill capacity
- Regions that exhaust capacity
 - Difficulty siting a new landfill
 - May resort to waste export
 - Escalating costs
- Cost effective to maintain and extend life of current sites
- Airspace has value – optimize airspace

Preserving and Extending Life

- Landfill airspace – function of:
 - Landfill geometry
 - Footprint size
 - Potential soil or rock excavation
- Airspace consumption – function of:
 - Waste disposal rate
 - Types of waste
 - Compaction of waste
 - Volume and type of cover
 - Settlement

Updated Landfill Criteria

- 1993 Landfill Criteria being updated
- Changes could impact smaller landfills
 - Service life exceeds contaminating lifespan
 - Landfill liners and leachate collection
 - Determination of contaminating lifespan
 - Preparation of new studies, e.g. Landfill Criteria Upgrading Plan

Landfills

- Operating
 - Squamish Landfill – 11,700 tonnes/year
 - Lillooet Landfill – 2,500 tonnes/year
- Closed
 - SLRD – 2 landfills near Pemberton
 - Whistler Landfill
- Unauthorized
 - Bridge River Band – 12 km north of Lillooet LF









ENTER
HERE →



Transfer Stations and Depots

- Whistler Transfer Station – to Rabanco, WA
- Whistler Function Junction Depot – to Whistler TS
- Whistler Nester's Depot – to Whistler TS
- Pemberton Transfer Station – to Squamish Landfill
- Devine Transfer Station – to Squamish Landfill & Whistler TS
- Gold Bridge Transfer Station – Lillooet LF

Transfer Stations





CARDBOARD
RECYCLER

GLASS TIN ALUMINUM

Carney's
Recycling & Waste Solutions
800.495.5828 carneyusa.com 408.552.3800





Landfill and Transfer Station Summary

- 4 transfer stations and 2 depots in region
- Landfills have value – preserve space
 - One landfill – 4 years life
- Updated Landfill Criteria – impact on Lillooet Landfill
- One unauthorized landfill

Waste Export and Import

- Waste export – transportation of waste for disposal out-of-region
- Typically used when landfill capacity runs out
- Economics – transfer and disposal
- Waste import – allowing waste from out-of-region
 - Used to obtain tipping fee revenue



Waste Flow and Flow Control

- Waste flow – driven by disposal options and economics
- Metro Vancouver – losing \$5 million to out-of-region facilities
 - Haulers bypassing disposal bans
 - Not paying fair share for system
 - Bylaw – all waste to Metro Vancouver facilities
- Other regions considering flow and flow control

First Nations

- Responsible for their own waste management
 - Most communities use transfer stations or self-haul
 - Most waste reaches facilities in SLRD
- Lytton Band waste to Thomson Nicola Regional District facilities
- Seton Band Landfill – closing 2015, transfer station
- Pavilion Band – closed landfill, transfer station
- Lil'wat Nation – closed landfill

Export, Flow Control and FN Summary

- Waste export – when landfill capacity runs out
- Waste import – for revenue
- Waste flow – economics
- Flow control – keep waste in region
- First Nations – responsible for their waste

Regional Landfill Options

- Squamish Landfill capacity – 4 years
 - Expansion would provide 46 years
 - Application not approved by Province
- Expanded landfill is an option for the region
- If landfill not expanded – region must consider out-of-region options
- New regional landfill not a short term option
 - High uncertainty, costly and time-consuming

Resource Recovery Options

- Large-scale resource recovery may not be feasible in short term
 - Timeline too short
 - Need economy of scale
- Out-of-region facilities a possibility
 - Metro Vancouver procuring new WTE capacity
 - Mixed waste MRFs being developed in Metro Vancouver, Fraser Valley

Regional Decision-making Criteria

- Costs and benefits
- Schedule – short term or long term
- Proven technology / option
- Greenhouse gas emissions
- Environmental impacts
- Transportation
- NIMBY or IMBY?
- Risk and security
- Public perception

Thank You