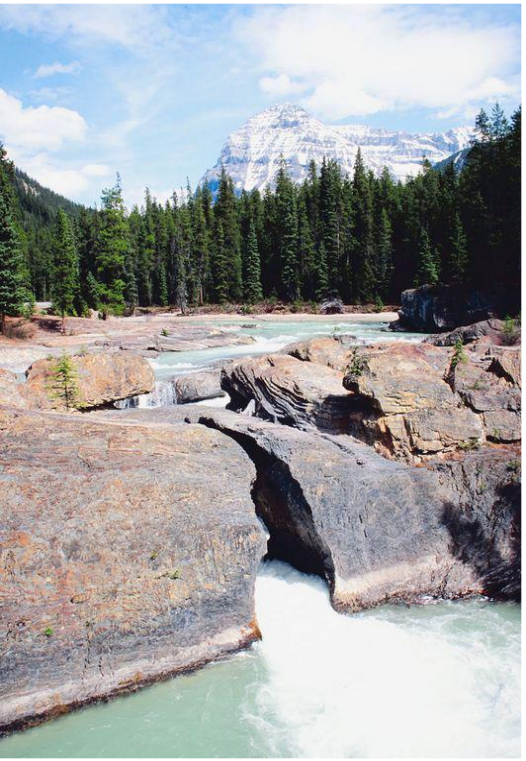


Integrating Sustainability Principles into Solids Management Planning

Tom Sigmund, Executive Director

Green Bay Metropolitan Sewerage District

GBMSD Facts

- Wholesaler of wastewater conveyance and treatment services.
- 17 municipal customers (217,000 people) and one direct industrial customer.
- Service area of 285 square miles.
- Two WWTPs seven miles apart, discharging to Fox River.
- Green Bay WWTP – 30 mgd.
- De Pere WWTP – 8 mgd.

GBMSD Treatment Facilities

De Pere Facility

Green Bay Facility

GBMSD Solids Handling

- All solids handling at Green Bay Facility
- Solids system brought online in 1976
- Multiple hearth incineration (MHI) is an outdated technology
- EPA Maximum Achievable Control Technology rule revisions will make operating a MHI very difficult
- Currently running MHI's at over 90% evaporative capacity

Planning for GBMSD's Future

Must replace the solids handling facility

1. Aging infrastructure
2. Environmental compliance required by March 2016
3. Increase evaporative capacity

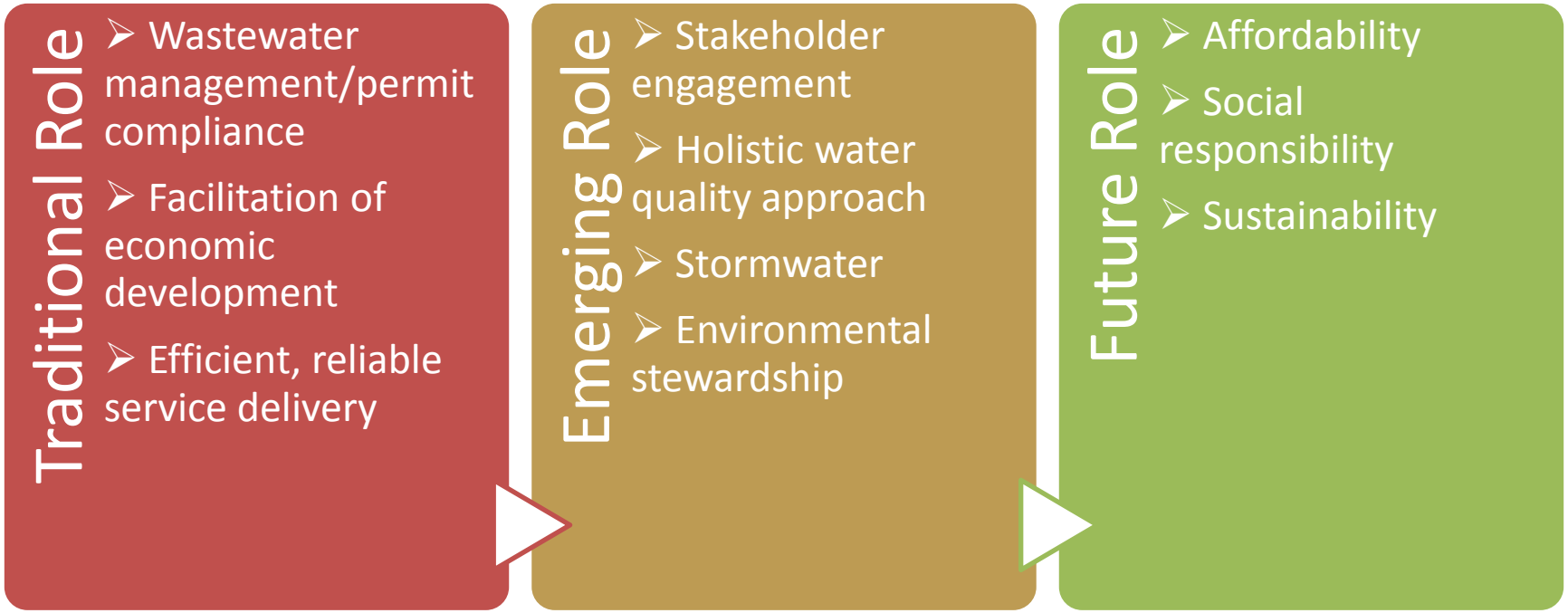
It will take five years to implement new technology

PLANNING ELEMENT NO. 1 – GOAL SETTING

GBMSD Strategic Planning

- Commission and senior staff undertook an update to strategic plan in 2008 using elements of Effective Utility Management primer
- Need for an “outside the fence” focus
- Improve customer and stakeholder engagement
- Increase GBMSD focus on the watershed
- Actions to be guided by a broad definition of sustainability

Sustainability Emphasis Reflects Evolving GBMSD Role



Collaborative Regional Leadership, Education, and Sustainability

SOLIDS MANAGEMENT PLAN WAS FIRST TO USE NEW APPROACH

Solids Management Plan Vision Statement

Establish a regional Solids Management Plan using a sustainable approach for energy, air, and solids within the social, environmental, and economical values of our customers and stakeholders.

Collaborative Approach (First Attempt)

- Used three advisory committees – external, internal, and Commission
- Newspaper ad, newspaper story, and newsletter email distribution list, and website requesting advisory candidate volunteers – over 40 applicants, 11 selected
- Meeting objectives:
  - A list of attributes and weighting to decide alternative
  - Input on strengths and weaknesses of the selected alternative

PLANNING ELEMENT NO. 2 – OBJECTIVES AND STRATEGIES

GBMSD Sustainability Objectives

Goal #1: Reduce nonrenewable electrical energy use by 25% by 2021

Goal #2: Reduce natural gas use by 15% by 2021

Goal #3: Reduce greenhouse gas emissions by 20% every 10 years

Goal #4: Reduce waste that has to be landfilled by 30% by 2021

Goal #5: Reduce potable water use by 10% by 2021

Why Resource Recovery?

- GBMSD is a top energy consumer!
- Energy cost (electricity and natural gas) is $4.3 million per year
- Energy cost is 22% of Annual O&M budget
- Technology is available to cost-effectively recover energy from wastewater

Project Approach

PLANNING ELEMENT NO. 3 – ALTERNATIVES ANALYSIS

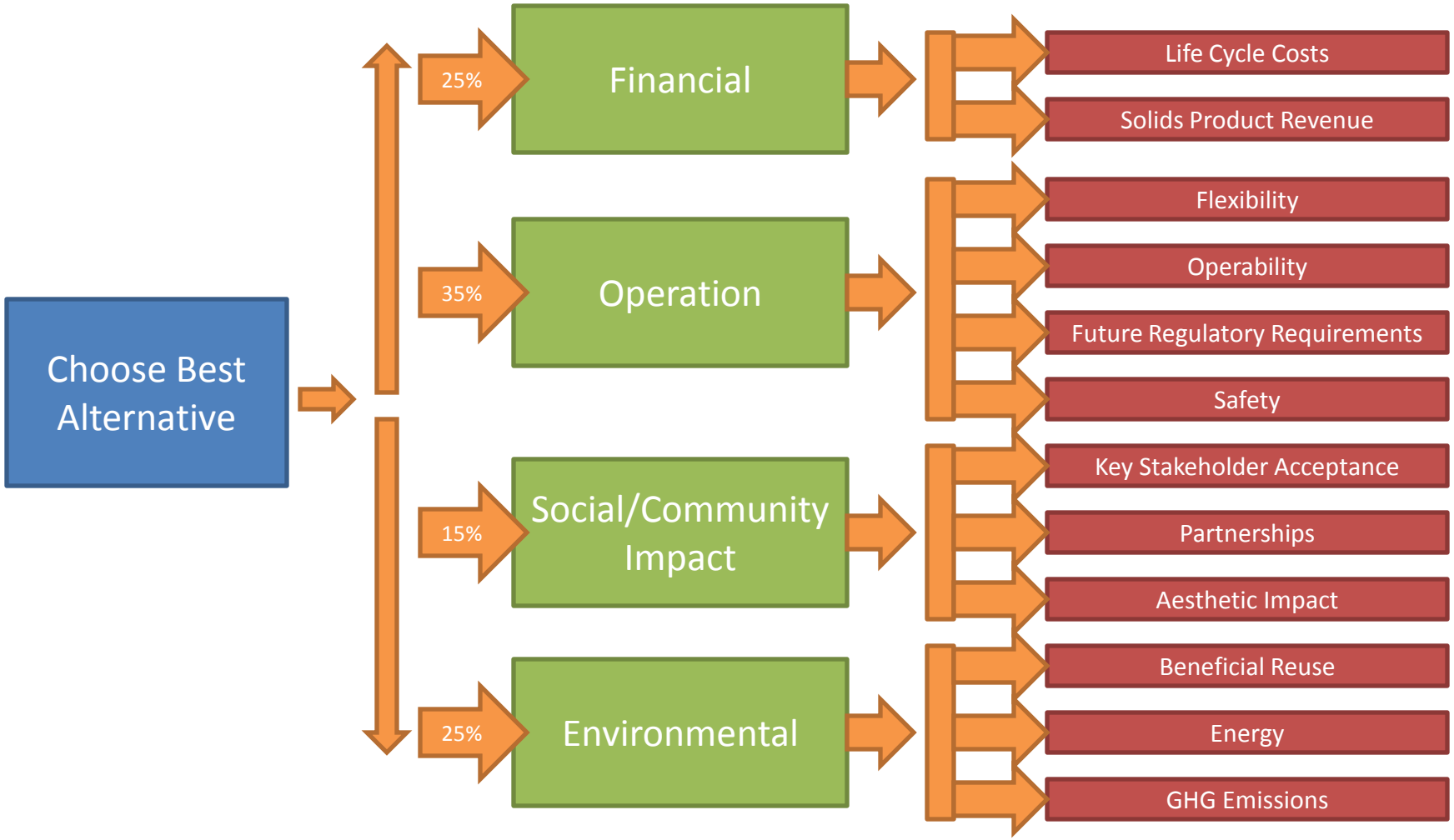
Alternative Evaluation Guidance

- Alignment of Solids Management Plan with the Strategic Plan goals
- Actively engage stakeholders
- Use multi-attribute utility analysis
    - Establish objective weights via step-wise tradeoff analysis.
    - Reference established performance measures.
    - Consider scoring relative to other investment options - maintain consistency.
    - Consider prevailing uncertainties and probabilities of occurrence (scenario analyses).

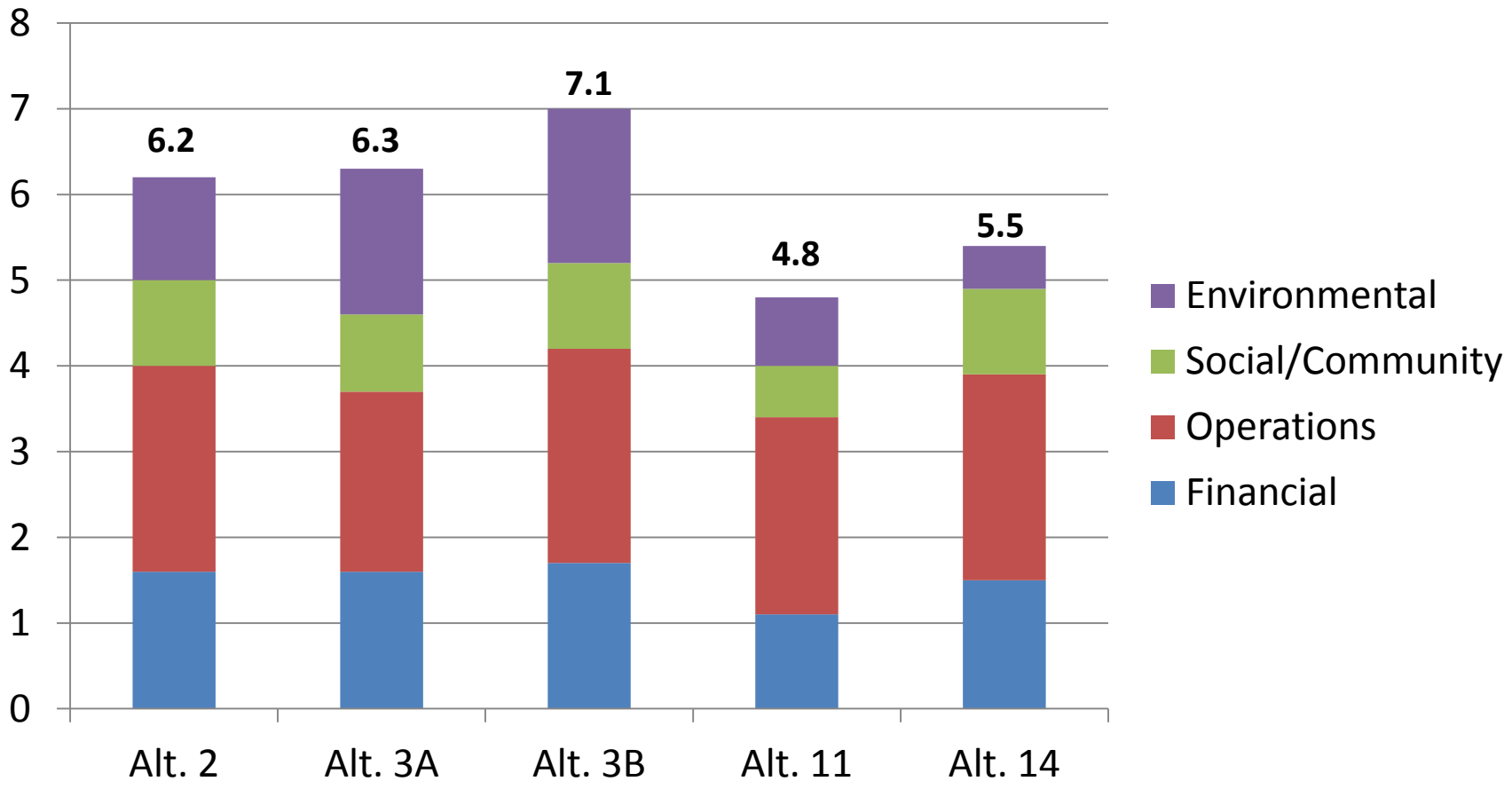
Alternative Analysis Supported Sustainability Approach

- Employed structured, rigorous analysis framework to consider monetary and non-monetary factors
- Defined criteria for weighting, scoring, and ranking across alternatives
    - Criteria and criteria weights based on advisory committee input and consistent with Commission values
- Criteria employed:
    - Financial impact (30%)
    - Operational flexibility (35%)
    - Social/community acceptance (15%)
    - Environmental impact (20%)

Objectives and Criteria Weighted for Selecting Alternatives



Alternative Scoring Helped Guide Recommendation



Customer Reaction to Recommended Alternative

- Present worth and capital cost estimates didn't register
- Choices were all expensive
- Rate impact was the main concern and drove customer frustration
- Poor economy made it difficult to understand why we were doing this project now
- Many meetings with customers were held to find a path forward

Collaborative Approach (Second Attempt)

Municipal and industrial customer working group formed and met four times over six months to explore alternatives in detail

- Ten municipality representatives
- Eight of GBMSD's largest wet industries
- Business civic group

We Asked: Can You Support this Project?

- Understood “do nothing” wasn’t an option
- Customers helped reduce capital cost by $8 million
- Customers bought into benefits of resource recovery
- No opposition at public hearing
- Letter of support for the project from a previously critical customer

Alternative Selection

- New way of thinking for GBMSD – Recovering Resources
- **Resource Recovery and Electrical Energy (R2E2) Generation Project** – scored best overall
  - Most energy production
  - Reduced greenhouse gas emissions
  - Lowest 20-year present worth
  - Energy expense offset with co-digestion
  - Flexibility to accept different wastes
  - Lowest O&M costs

Summary

- Evaluation process incorporated sustainability principles and GBMSD values
- A very different approach for GBMSD
- Evaluation process was objective, transparent, and defendable. Provided structure to decision process
- Recognizing sustainability factors changes the dynamics of resource allocation decisions

Summary

- Underestimated the need for customer and stakeholder involvement
- Recognized and adjusted approach to meet customer concerns as they became apparent
- Structured and transparent alternative evaluation process minimized backtracking when challenges arose
- This project will position GBMSD well for the future

For More Information

- www.gbmsd.org
- R2E2 Video available on Website

Tom Sigmund

Executive Director

tsigmund@gbmsd.org

(920) 438-1095