Integrated Resource Management in Colwood

Towards "Grid Positive, Carbon Neutral and Water Smart"

4th November, 2008

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Why do an IRM Study for Colwood?

- CRD has responsibility for water, solid and liquid waste management
- CRD reviewing approach to sewage treatment, including resource recovery
- This study shows how this type of approach might work in Colwood – based on provincial report
- Assist Colwood negotiate its interests with CRD

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IRM Principles

- Resource use reduction
- Resources not waste
- Integrated thinking
- Geographical integration
- Driven by the business case

How can we maximise value from resources?

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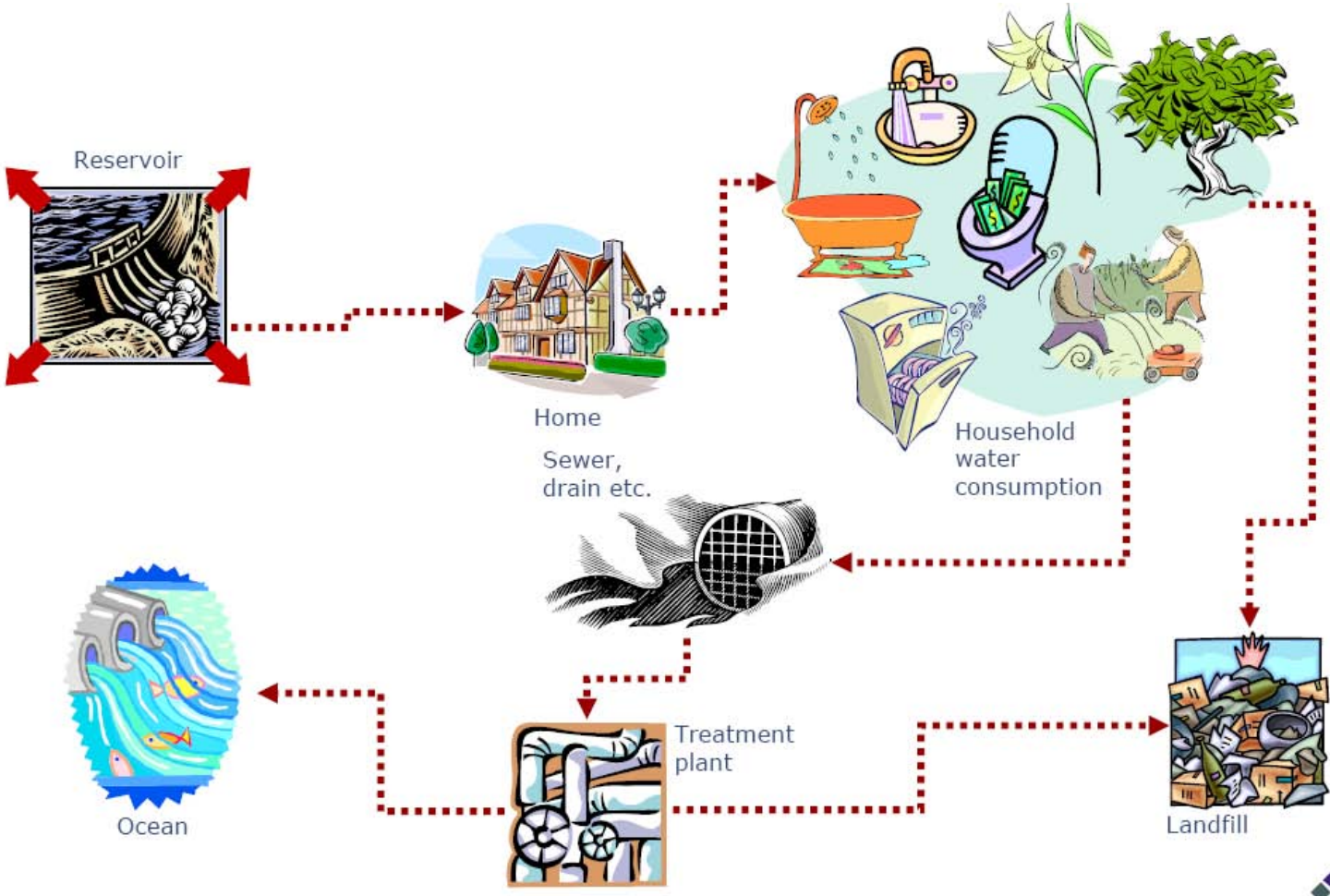
Traditional Approach



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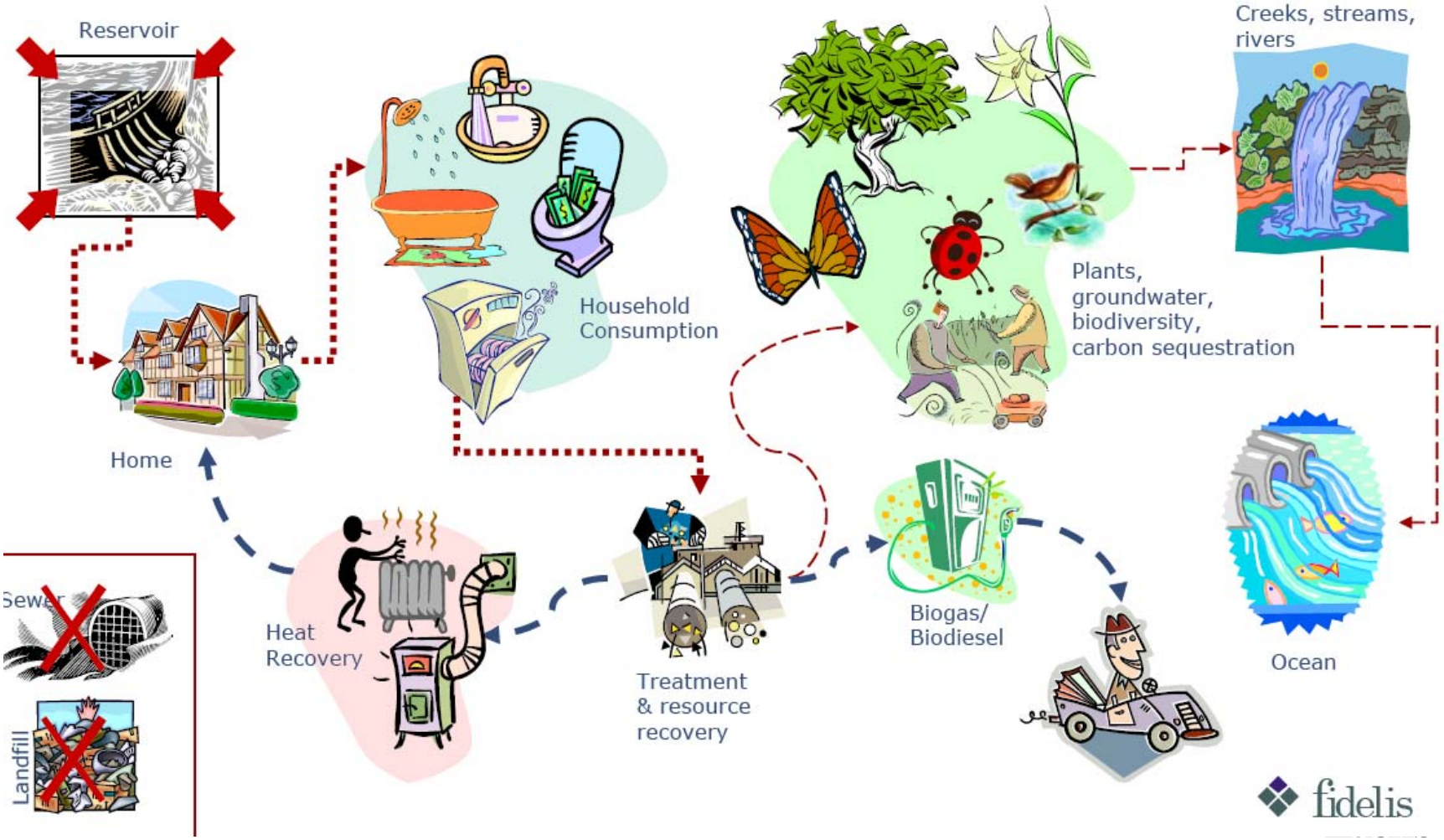
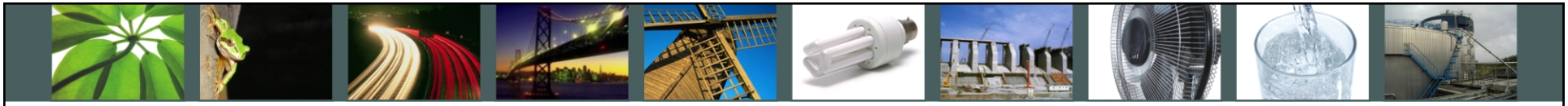
Integrated Resource Management Approach





IRM Components

- Use less, find alternatives
- Recover the remainder (IRM)

	Water Examples	Energy Examples	Materials Examples
Reduce	Use low flow appliances Let lawns go brown in summer	Use energy-efficient appliances Turn off appliances when not in use	Purchase durable items rather than 'throw-aways' Use less paper
Replace	Capture rainwater for irrigation, toilet flushing, laundry, etc.	Install solar hot water tanks Use geoexchange for heating	Use cloth bags rather than plastic Use paper with high recycled content
Reuse	Re-use greywater (where permitted)	Capture heat before it leaves the building (e.g., warm water from showers, heat from dryers)	Refill containers rather than buying new
Recover	Use reclaimed, treated water for irrigation, enhancing streams & recharging groundwater	Reclaim energy from liquid and solid wastes	Reclaim energy from liquid and solid wastes

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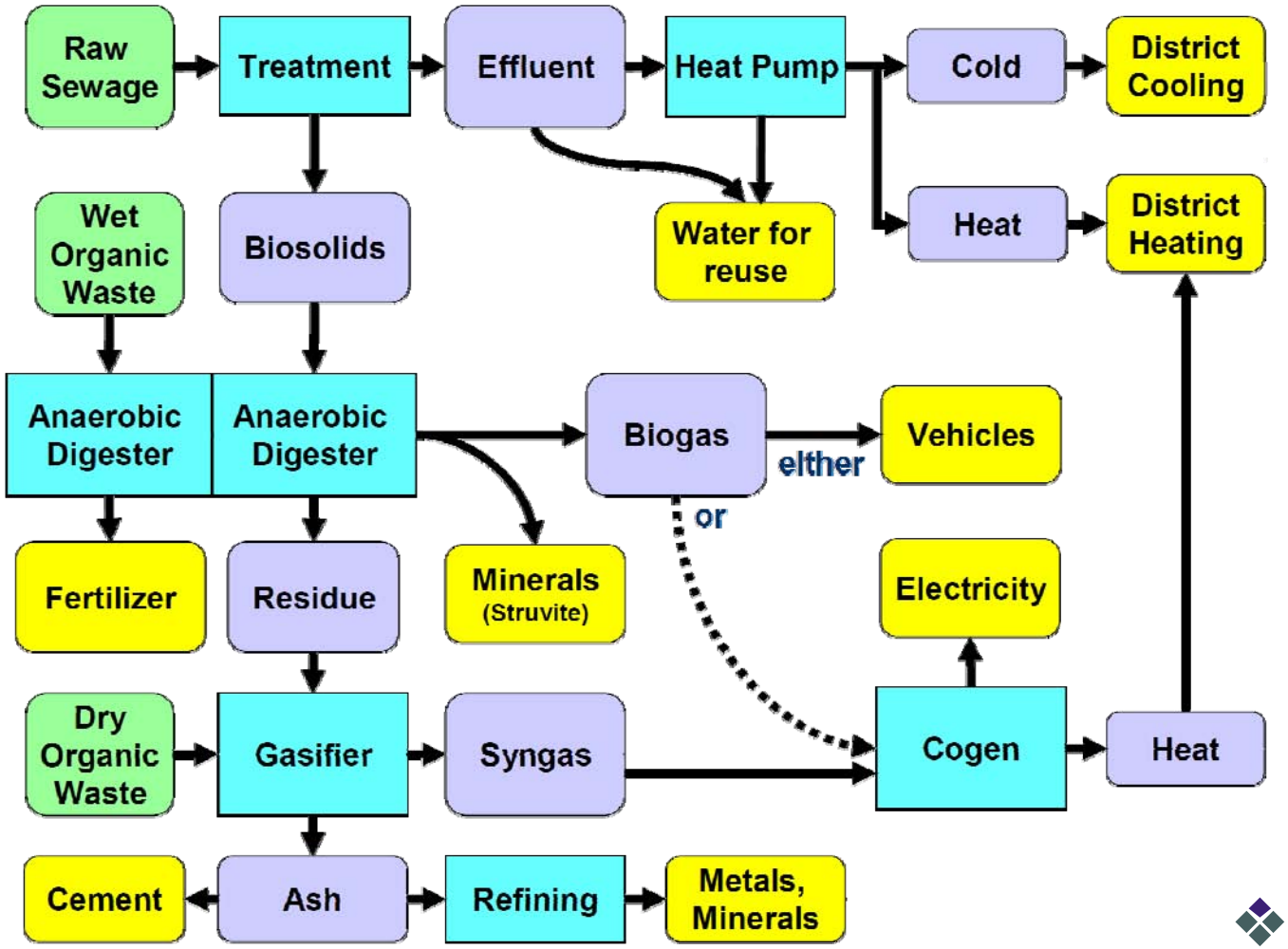
IRM Flow Diagram



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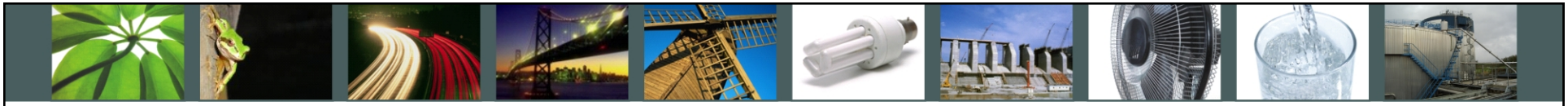
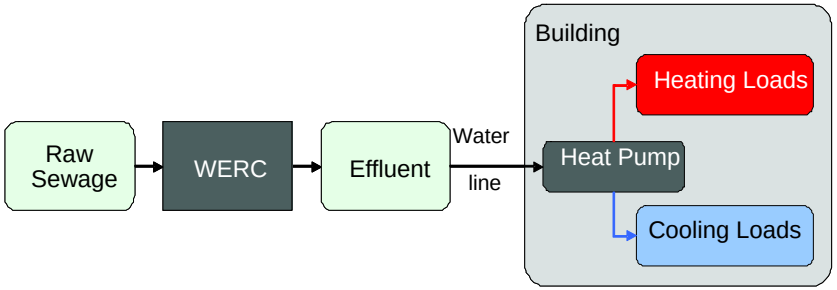


IRM Components

- Distributed Water and Energy Recovery Cells (WERCs)
  - Sited near water/energy clients
  - Small, fit into landscape
  - Tertiary treatment
  - Heat and cooling
  - Water for irrigation and groundwater recharge

Dockside Green WERC



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IRM Components

- Biogas digester
  - Accepts wet organic waste
  - and biosolids
  - Residues from clean sources can be used as fertilisers
  - Produces heat, biogas, residue for gasification
- Gasification/cogeneration
  - Accepts dry organic waste, digester residues
  - Produces heat, electricity, inert ash

Anaerobic Digesters in Kristianstad, Sweden

Dockside Green Gasification Plant

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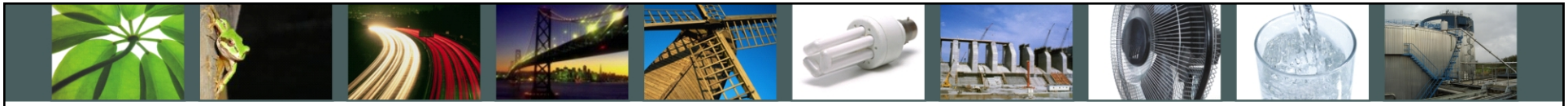

IRM in the Capital Region

- Key conclusions: if fully implemented, the IRM approach has the potential within the CRD to:
  - Power the equivalent of 10% of homes
  - Heat the equivalent of 30% of homes
  - Reduce greenhouse gas emissions by 25%
  - Run the equivalent of 10% of cars
  - Recover clean, usable water
  - Limit tax increases

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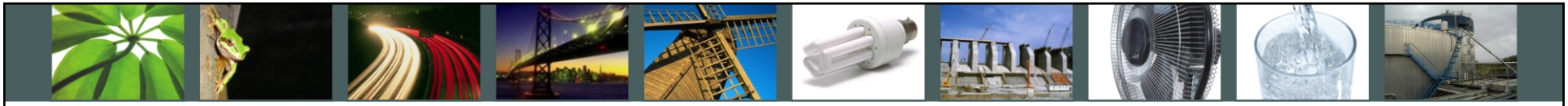
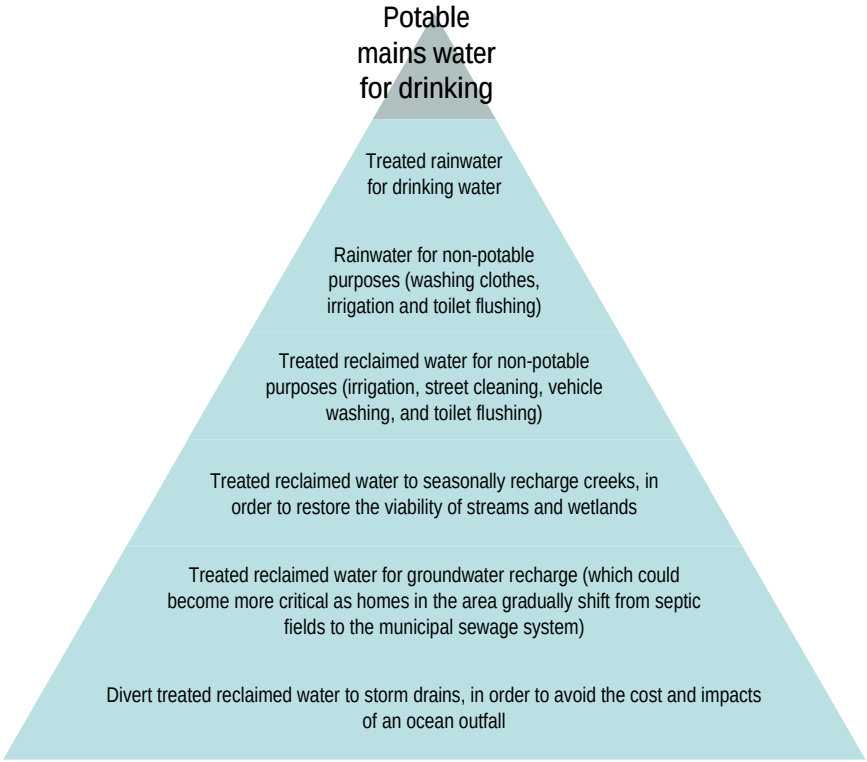


An IRM Approach for Colwood: Grid Positive, Carbon Neutral and Water Smart

- OCP Goal: Water, Resources & Wastes:
  - Promote efficient use and re-use of water and other resources. Reduce the consumption of non-renewable resources in favour of renewable resources.
- Grid positive: contributes more energy than it takes
- Carbon neutral: no net release of GHGs
- Water smart: Fit for purpose use, supporting healthy aquatic ecosystems



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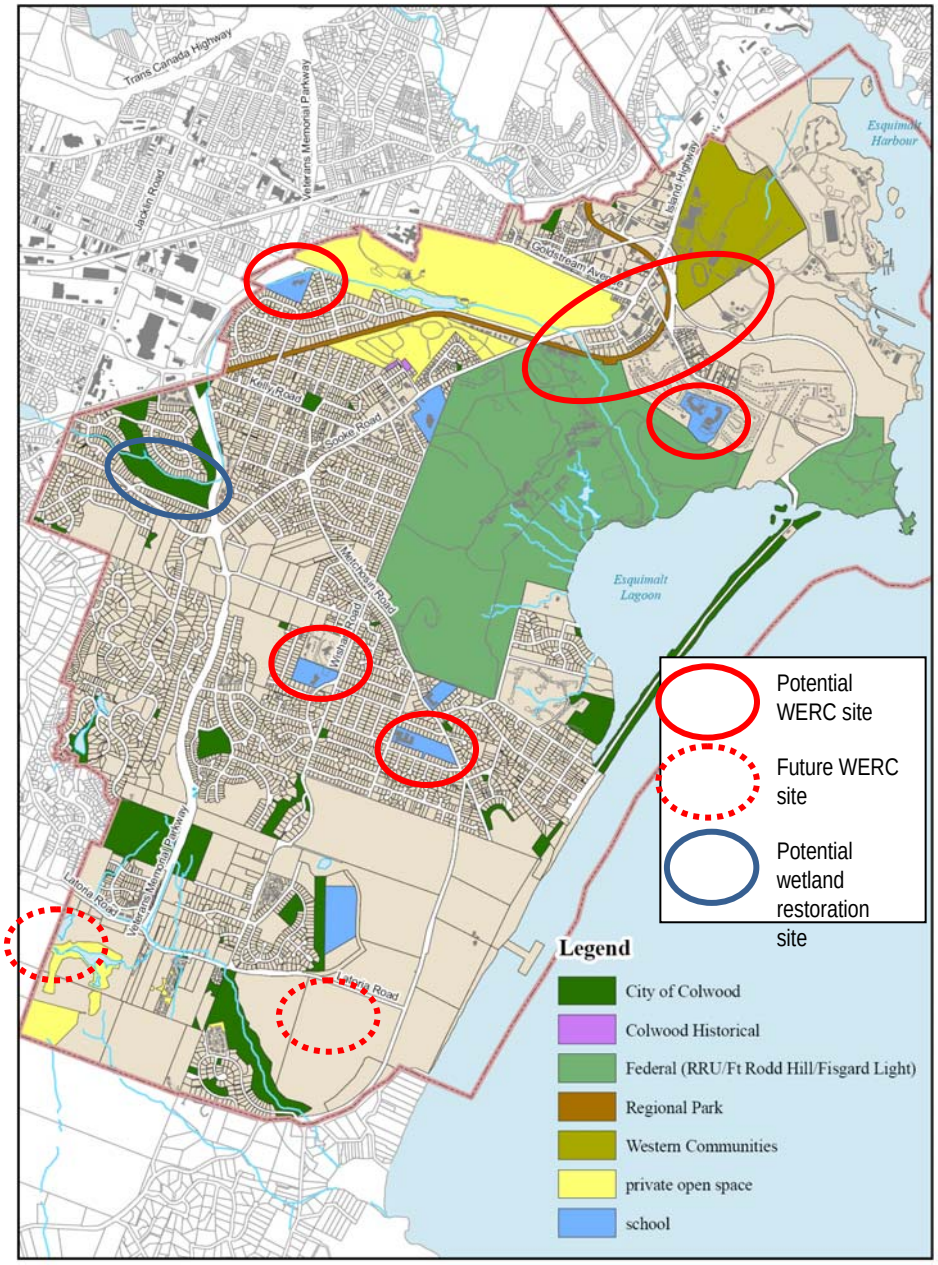
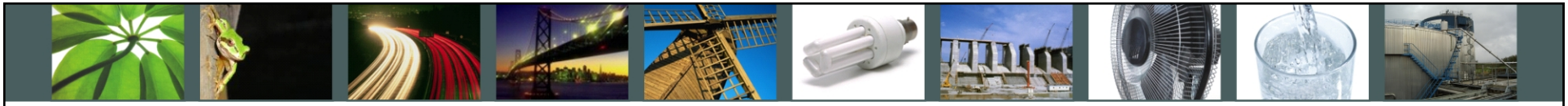
IRM in Colwood: Concept

- Up to 5 WERCs
- Energy centre (digester, gasification, cogeneration)
- Wetland restoration and stream/groundwater recharge





IRM in Colwood: Reality and Options

- Could be implemented – better if done in broader (West Shore or regional) context
- Business case for WERCs marginal at best, but combined with Energy Centre can be viable
- IRM is essential for Colwood to achieve its three goals
- Ownership of resources, removing regulatory barriers still to be resolved
- Many benefits that can be achieved even without full IRM
- Improve negotiations with CRD on future resource recovery options

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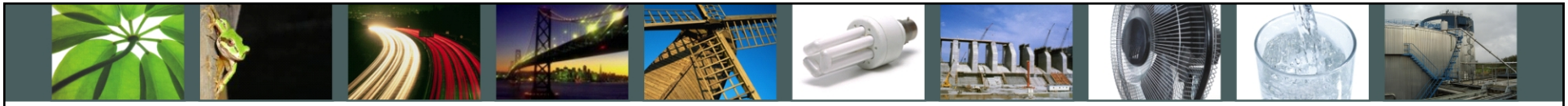

Recommendations and Next Steps (Summary)

- Work with others (RRU, neighbouring municipalities, DND,)
- Establish Sustainable Colwood Committee
- Help homeowners (ideas, financing, savings) and developers (criteria for new developments)
- Undertake detailed energy and resource plan,depending on cooperation with other parties
- Issue RFEI for WERC at City Hall/Wishart School

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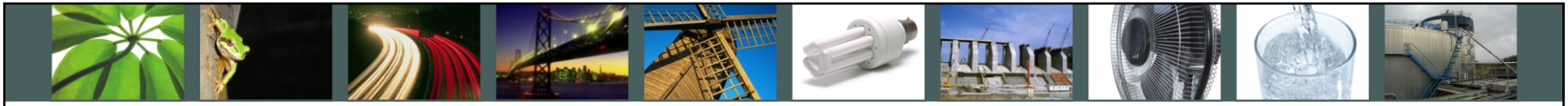

Questions?

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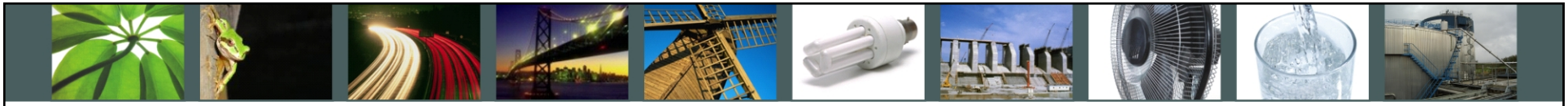
Aqua-Tex Scientific Consulting Ltd. (1993)

asset strategics

FARALLON CONSULTANTS LIMITED

Design is Anticipation™



Detailed Recommendations: Immediate Actions

1. Expand the boundaries of the IRM model and complete a more detailed business case
2. Establish a Sustainable Colwood Committee
3. Meet with Sustainability Facilitator for Vancouver Island
4. Consolidate and reconcile resource control
5. Apply for FCM and other funding to prepare an Energy and Resource Plan

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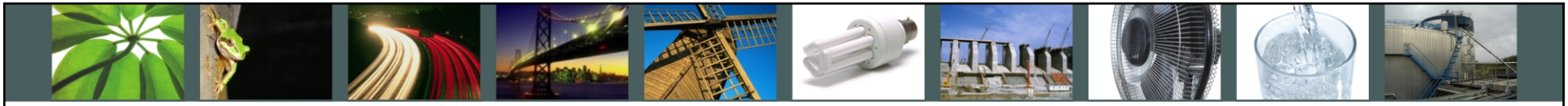

Detailed Recommendations: Low hanging fruit

6. Establish a "Sustainable Colwood" program for homeowners
7. Create a sustainable finance program to support homeowners
8. Collaborate with Royal Roads University
9. Develop an Energy and Resource Plan

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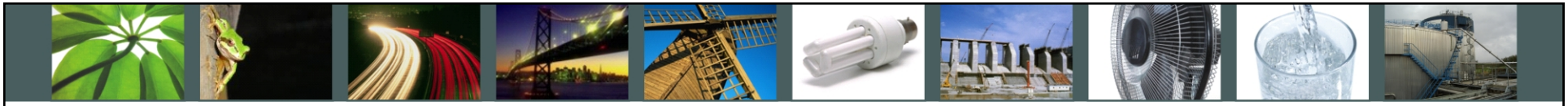

Detailed Recommendations: Low hanging fruit cont.

10. Develop policies for new development/re-development regarding water and energy use
11. Gather baseline data for water quality, groundwater, soils, and airshed
12. Strengthen municipal processes to include triple bottom line
13. Issue an RFP for a feasibility study for a WERC (suggested for Wishart School/City Hall); design and build the WERC

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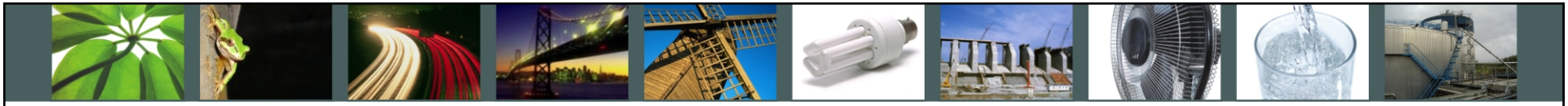

Detailed Recommendations: High-hanging fruit

14. Integrate IRM with adjacent municipalities
15. Full implementation of a resource recovery approach

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