Energy Performance Contracting for Water and Wastewater Projects

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Presentation Outline

- What is Performance Contracting?
- Why Should I Care?
- What are the Benefits?
- What are the Challenges?
- Conclusions and Recommendations
- Questions??

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What is Performance Contracting?

Typical Municipal Project Delivery

- Engineering
  - Studies
  - Design
  - Services During Construction
- Construction – Bid by Contractors
- Owner holds both contracts

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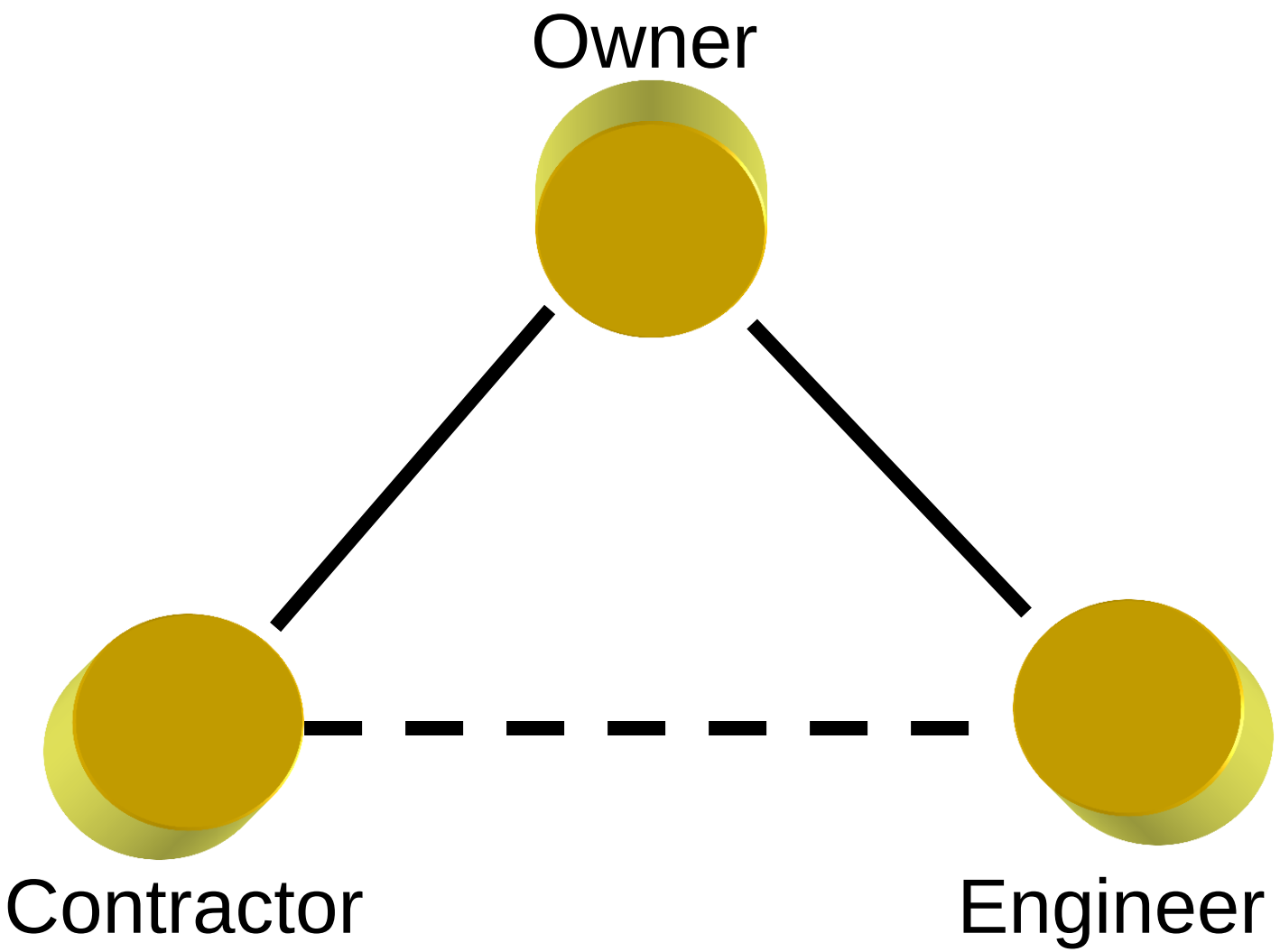
Typical Municipal Project Delivery



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Energy Performance Contracting

- Alternative delivery/procurement mechanism
- Implement necessary infrastructure improvements that reduce energy consumption and operating costs
- 3rd party financed and paid thru cost savings (avoidance)
- Paid through existing utility budget
- Identify, fund, design, and construction of Energy Conservation Measures (ECMs)

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Energy Performance Contracting

- **Design/build/finance** – with ongoing services
- Use **cost savings** from the project to solve issues, improve performance and fund CIP measures by redirecting funding to improvements instead of Utility bills.
- **Streamlined procurement** allows for faster project completion AND you can hand-select equipment and contractors (Wisconsin State Statutes, Chapter 66 – General Municipal Law, Article 66.0133)
- Achieve master plan benefits in advance of next capital project or plant upgrade
- Project financing paid from savings – with **guaranteed results**
- **Bundle energy conservation measures** for a more impactful program – shorter payback measures support longer payback measures

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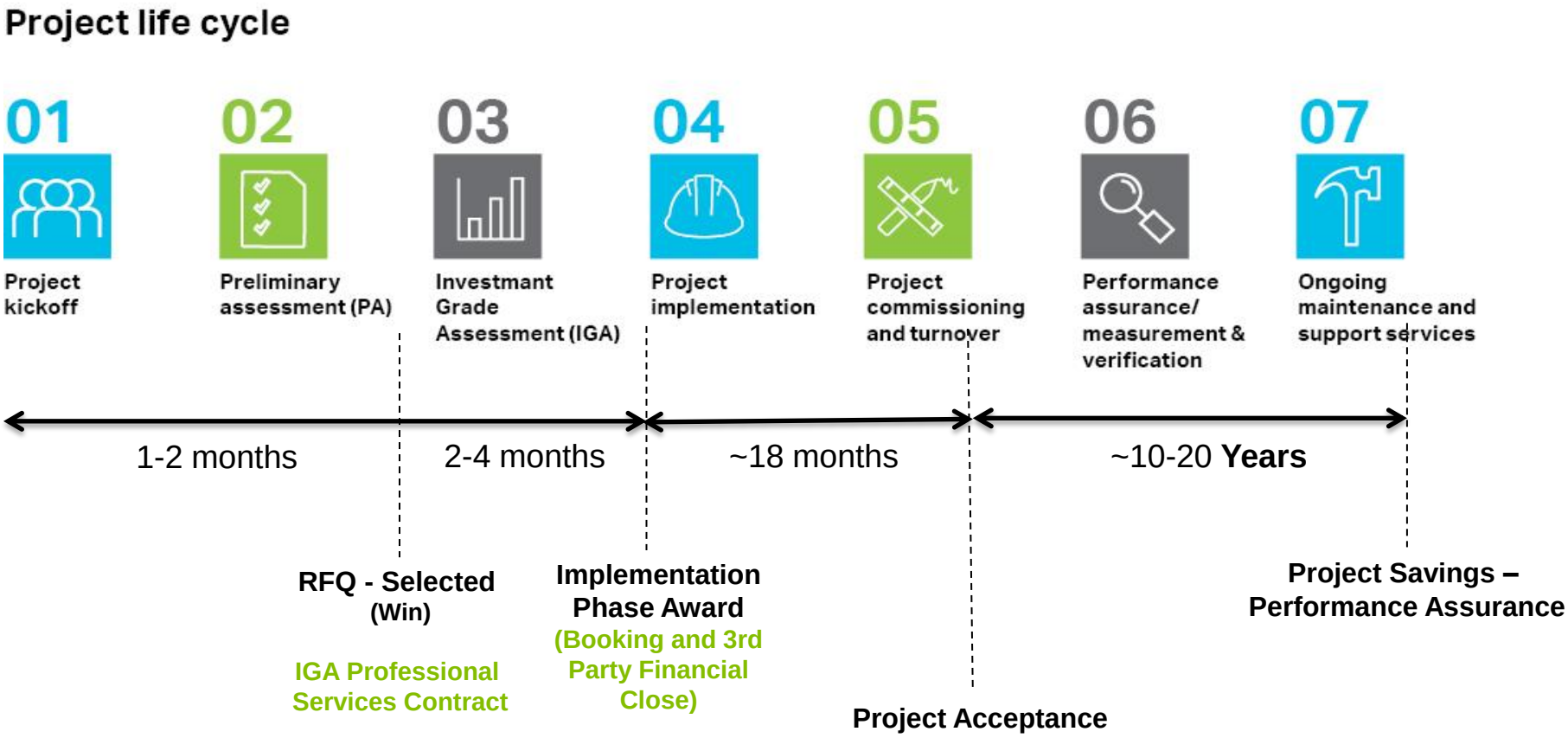
Performance Contracting Process



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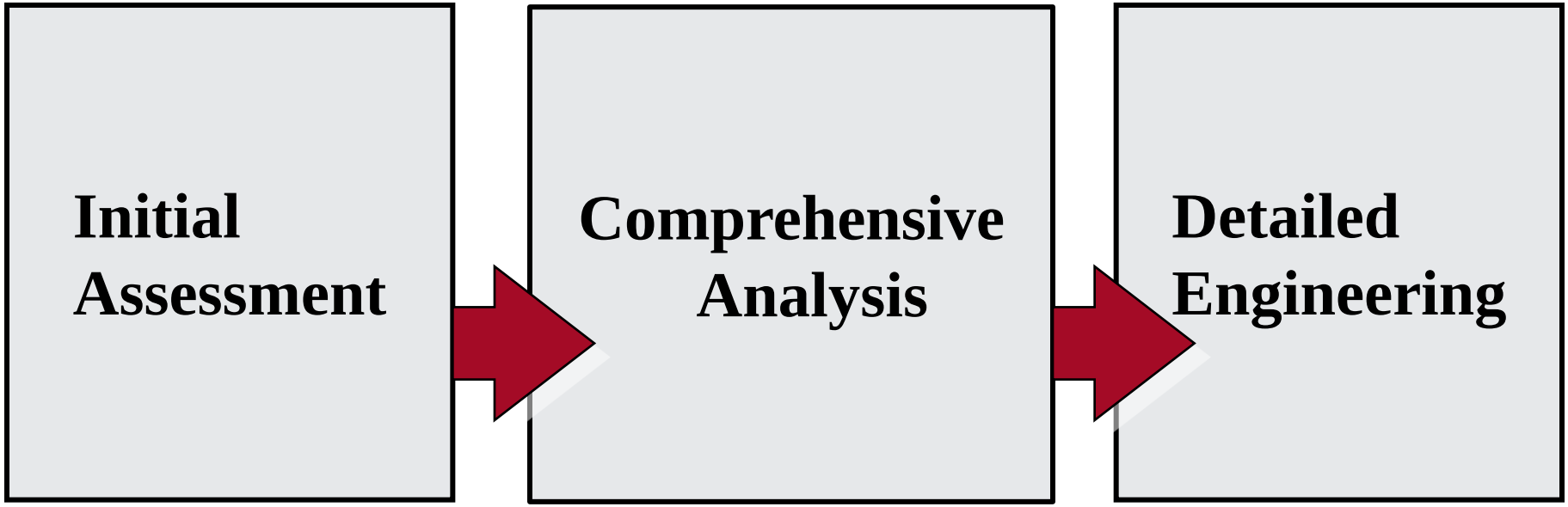
Solution Design Phases



Customer Interview
Review of Utility Bills
Facility Survey
Financial Modeling
Benchmarking

Utility Consumption/ Demand Profiles
Load and Power Factors
Rate Structure
Plant Survey
Development of Energy Baseline
Data Logging Instruments
Computer Utility Baseline Modeling
Preliminary Engineering Calculations
Establish Budgetary Cost vs.. Savings

Design and Specifications
Detailed Construction Plans
Equipment Cut sheets
Operating Characteristics
Drawings and Technical Submittal

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Energy Services Companies

Energy Service Company (ESCO)

– Identifies energy savings opportunities

– Guarantees a specified level of cost savings

– Incurs the cost of developing and implementing an energy project

– Finances, designs and constructs the project

Ordering Agency (Customer)

– Selects ESCO

– Negotiates, awards and administers contract

– Ensures that savings exceed contractor payments

Financial Approach

- Project funded through energy/operational reductions
- Capital improvements without budget increases
- Annual cost less than annual savings
- Excess savings remain with City

Measurement and Verification

- Required to verify proper operation to achieve guaranteed savings
- Defined in contract between ESCO and Owner
- Often includes some level of operations or maintenance assistance
- Often done in accordance with International Standard from the EVO (Energy Valuation Organization)
  - IPMVP – International Performance Measurement & Verification Protocol
  - www.evo-world.org

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Why Should You Care?

Municipal Issues

– Many have capital project restrictions or holds

– Energy largest recurring cost after labor

– Many have sustainability and energy conservation goals

– Many states have renewable energy portfolio requirements

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Energy Services Companies

- Many large, reputable Energy Services Companies (ESCO)
- National Association of Energy Services Companies (www.naesco.org)
- Historically for private buildings and industrial facilities
- Substantial number now are municipal and federal projects

NAESCO National Association of Energy Service Companies

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Energy is Hot!!

- Water Environment Federation's (WEF) 2011 position statement called for "wastewater-generated energy to be widely-recognized as a renewable resource"
- Many municipalities have established sustainability offices or managers and have defined energy or greenhouse gas reduction goals
- Alternative project delivery is anticipated to grow substantially including PC (which many consider a form of Design-Build)

ESCOs – Water and Wastewater

- Successful projects for municipal buildings
  - Libraries
  - Schools
  - Courthouses
  - City Halls
- Often largest municipal energy user is water and/or wastewater facilities
- ESCOs typically do not have water/wastewater expertise, experience, or licensure needed
- Results in formation of teams with consulting engineers for water/wastewater projects

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What are the Benefits?

Financial & Operational Benefits

– Plant improvements funded by guaranteed savings

– Reduction in plant operational costs

– Jointly establish common objectives and goals

– Measurement & verification of savings

– Design, build, on going support ESCO responsibility

Benefits (con't)

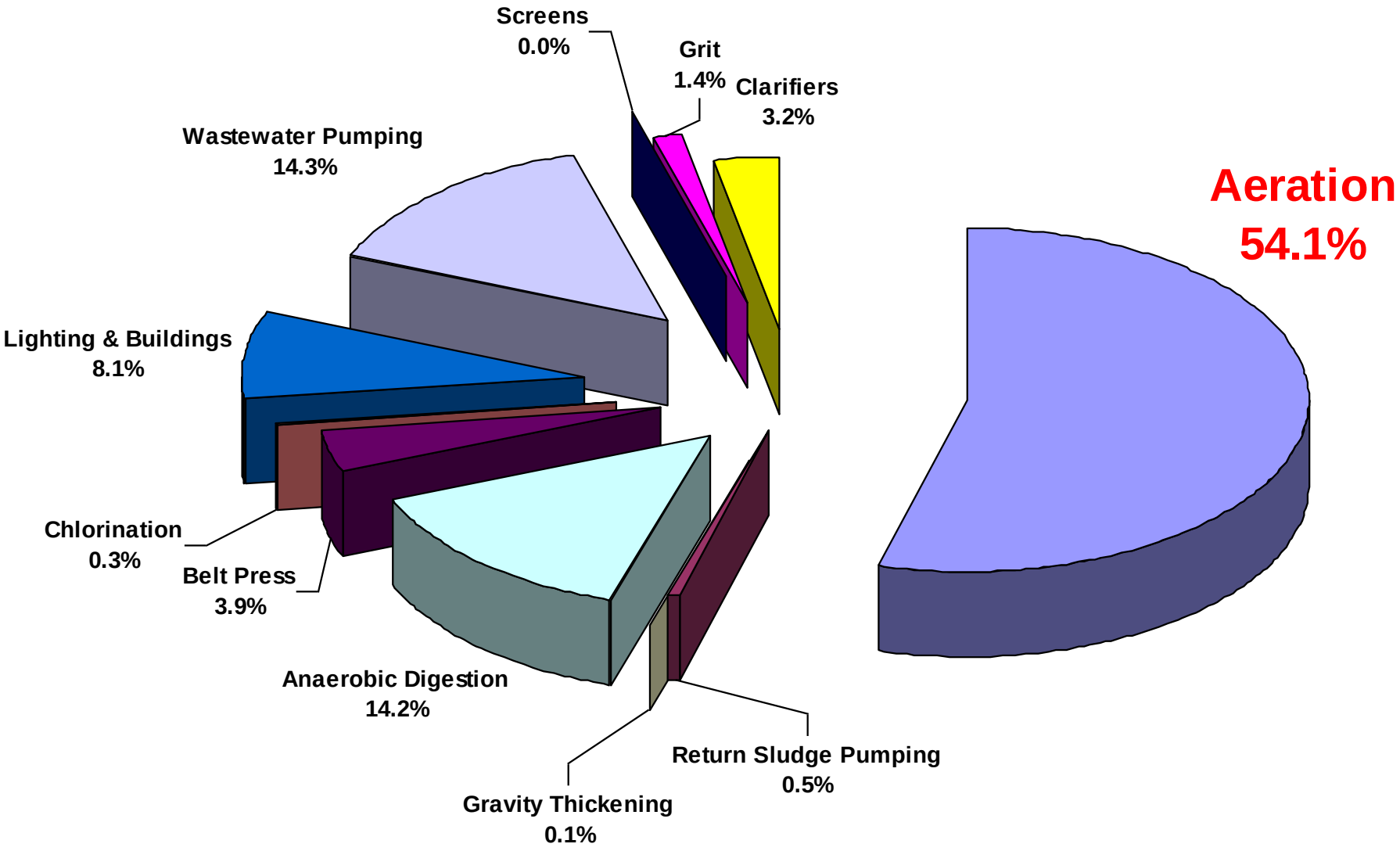
- Comprehensive Approach
  - Maximize benefit to facility
  - Combine longer payback measures with shorter ones for reasonable overall payback
- Substantial Risk Transfer
  - From facility to ESCO
  - Design, implementation, performance
  - Guarantee that debt service paid from savings

Typical Water and Wastewater Projects

– Water
  - New meters and meter automation
  - Pump improvements
  - Pump and pressure instrumentation and controls
  - Treatment plant improvements
  - Building Improvements – typical ESCO projects

Typical Water and Wastewater Projects

– Wastewater
  - Aeration system improvements, automation, and controls
  - Pump improvements
  - Pump instrumentation and controls
  - Digester gas Combined Heat and Power (CHP) or Cogeneration
  - Other process improvements
  - Building Improvements – typical ESCO projects



Electricity Requirements for Activated Sludge Wastewater

Derived from data from the Water Environment Energy Conservation Task Force *Energy Conservation in Wastewater Treatment*

What are the Challenges?

Working with ESCOs

– Proposals and interviews – lack of familiarity/preparation

– Preliminary phase done for no fee
  - Want to spend minimal dollars
  - Fast turn around expected
  - Lack of understanding of differences from typical projects
  - Building modifications versus technical, brick-and-mortar projects

– Payment Options – issues and concerns

Working with ESCOs (con't)

- Design and construction phase similar to design build
  - Cost risk
  - Owner input and feeling of loss of control
  - Lack of understanding of regulatory environment
    - Permits (e.g., air, stormwater)
    - Reviews and approvals

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Working with ESCOs (con't)

- Client Perception
  - Cheapened project (similar to DB)
  - Loss of control (also similar to DB)
- Memorandum of Understanding
- Confidentiality Agreement
- Contract Terms and Conditions
  - Consequential Damages
  - Performance Liability
  - Need clear, well defined roles, responsibilities, LOE, etc.
  - Early involvement in project definition and costs

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Working with ESCOs (con't)

- Risk identification and mitigation
  - Construction
  - Pricing
  - Permitting
- Owner involvement and buy-in
- Owner requirements, cons
- Reviews, QA, QC imp
- Change management
- Communication
- Documentation

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Selection of ESCO

- Many major firms with a variety of expertise
- Several regional firms
- Typical teaming issues
  - Client alignment and reputation
  - Cooperative, true teaming approach
  - Winning proposition
  - Mutual respect and understanding

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Conclusions and Recommendations

Conclusions

- Energy a Major Issue to Municipalities
- Water and Wastewater Major Municipal Energy User
- Performance Contracting a Growing Alternative Project Delivery Method
- Multiple ESCOs Active in the Market
- PC Can Provide Funding and Other Benefits

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Recommendations

- Consider PC Opportunities
- Vet ESCO and Project
- Obtain Assistance from Experienced Individuals
- Contract Very Carefully

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Questions??

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Additional References

Resources and Contacts

- US Department of Energy, Office of Energy Efficiency & Renewable Energy
  - http://www1.eere.energy.gov/femp/financing/superespcs.html
  - Contains tools, templates and guidance
- Introduction to Performance Contracting by Energy Star
  - http://www.energystar.gov/ia/partners/spp_res/Introduction_to_Performance_Contracting.pdf
- IPMVP Standard for Measurement & Verification (from NREL – National Renewable Energy Laboratory) http://www.nrel.gov/docs/fy02osti/31505.pdf

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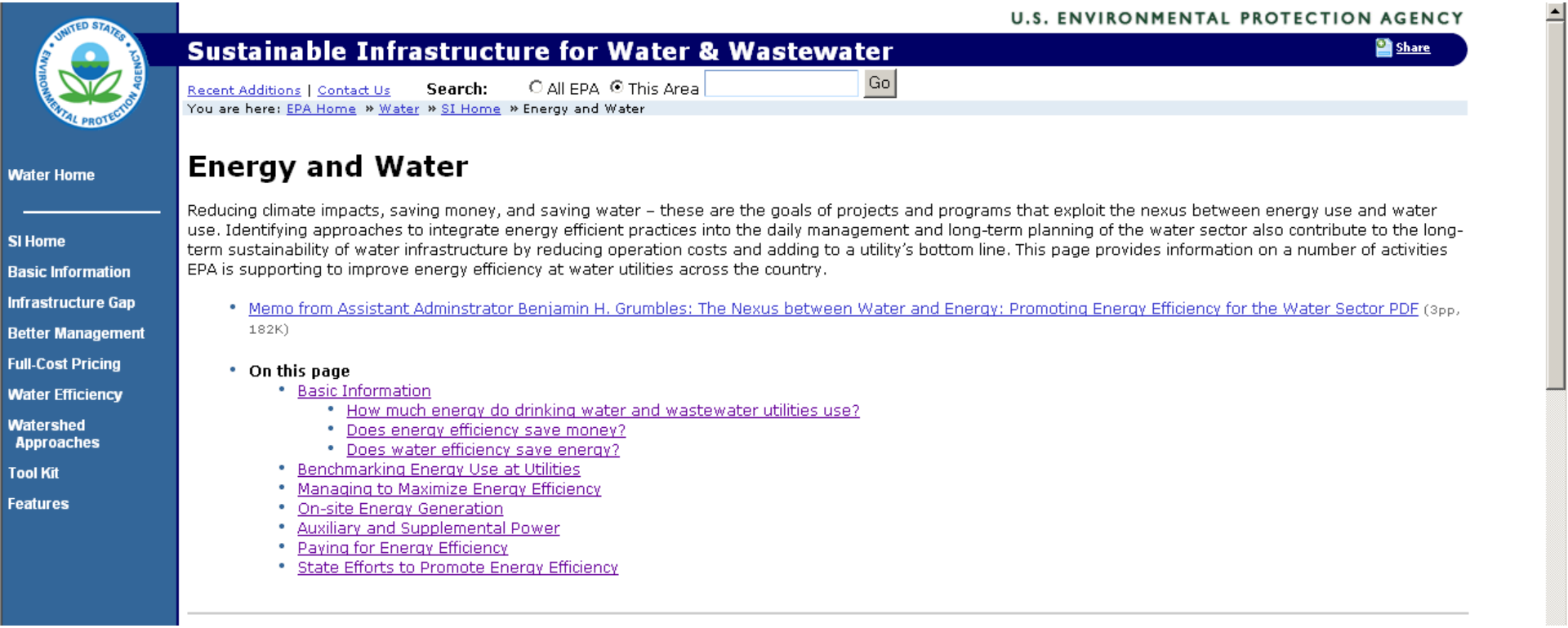
USEPA Site



http://www.epa.gov/waterinfrastructure/bettermanagement_energy.html

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EPA Encourages Combined Heat and Power (CHP)

www.epa.gov/chp

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