

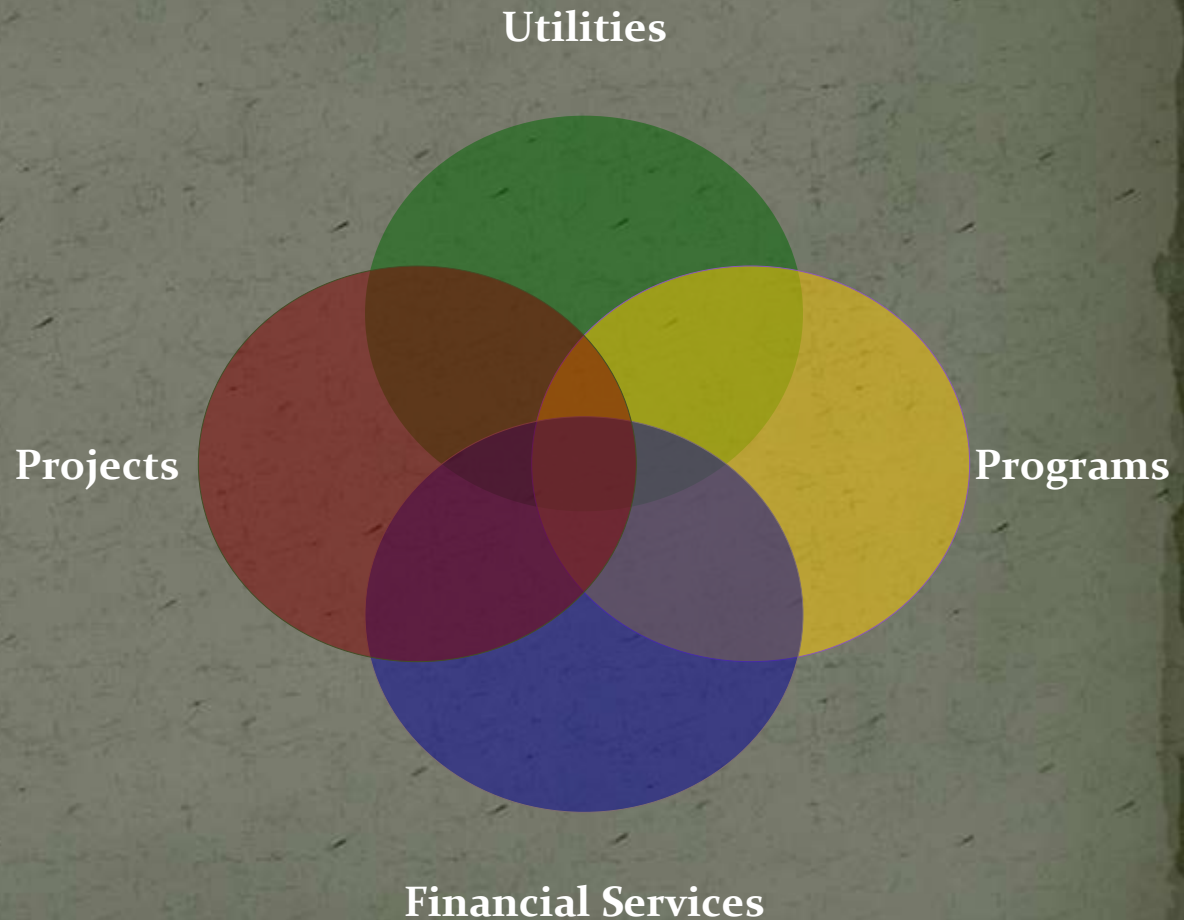
Developing A Strategic Energy Master Plan

Indiana Wastewater Association
November 17, 2010



Agenda

- What is it?
- Why do it?
- How to do it?
- Q&A



What is it?

*A Strategic Energy Master Plan is a site specific roadmap for your **sustainable** operation for optimal costs.*

Why do it?

- Budget control
- Understand pinch points
- Without goals you drift
- Make data driven decisions
- Long term plan
- Prioritize improvements

Supply		Utilization	Information	Alternatives
Utilities		Projects	Programs	Financing
<p>A</p> <p>Gas</p> <p>Electric</p> <p>Water/Sewer</p>		<p>B</p> <p>Asset</p> <p>Modernization</p> <p>Energy Projects</p>	<p>C</p> <p>Auditing</p> <p>Modeling</p> <p>Training</p> <p>Outsourcing</p>	<p>D</p> <p>Grants</p> <p>Leases</p> <p>Project Financing</p> <p>ESPC</p>
Year 1	<ul style="list-style-type: none"> • Electric tariff Change 	<ul style="list-style-type: none"> • Lighting Retrofit 	<ul style="list-style-type: none"> • Staff training on energy • SCADA utilization • System modeling 	<ul style="list-style-type: none"> • Self funding
Year 2	<ul style="list-style-type: none"> • Natural gas open market 	<ul style="list-style-type: none"> • Biolsolids handling 	<ul style="list-style-type: none"> • Process optimization 	<ul style="list-style-type: none"> • Capital project for energy setup in rate
Year 2	<ul style="list-style-type: none"> • Change primary voltage 	<ul style="list-style-type: none"> • Cogeneration 	<ul style="list-style-type: none"> • Outside Engineering 	<ul style="list-style-type: none"> • Bond
Year 4	<ul style="list-style-type: none"> • - 	<ul style="list-style-type: none"> • Solar Energy 	<ul style="list-style-type: none"> • Outside Engineering 	<ul style="list-style-type: none"> • Energy Grant

Utilities

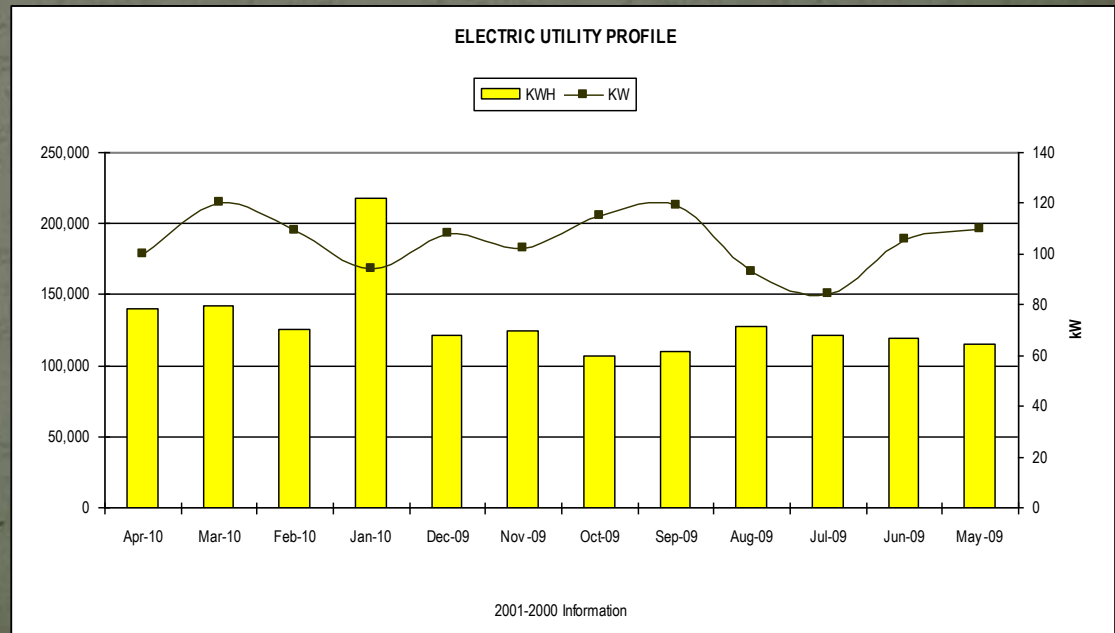


- Develop a baseline
- Rate Analysis
- Benchmark
- Set goal

Utilities



- 12 months of data is a baseline
 - Electric
 - kilo-watt hours (kwh)
 - kilo-watts (kw)
 - power factor (%)
 - Natural gas



Benchmark

- Benchmark
 - Compare to other similar plants
 - Look at:
 - Kwh/mgd
 - Kwh/pounds of BOD



EPRI CEC Report CR-104300, July, 1994, Figure 3-1

Rate Analysis



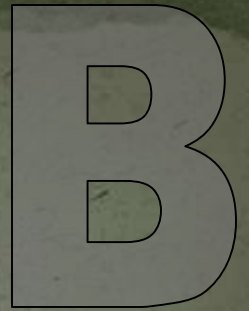
- Understand your rate tariffs
 - Ratchets
 - Load factors
- How does your operation affect your billing?
- Look at receiving voltage?
- Check meters numbers, verify they exist

Projects

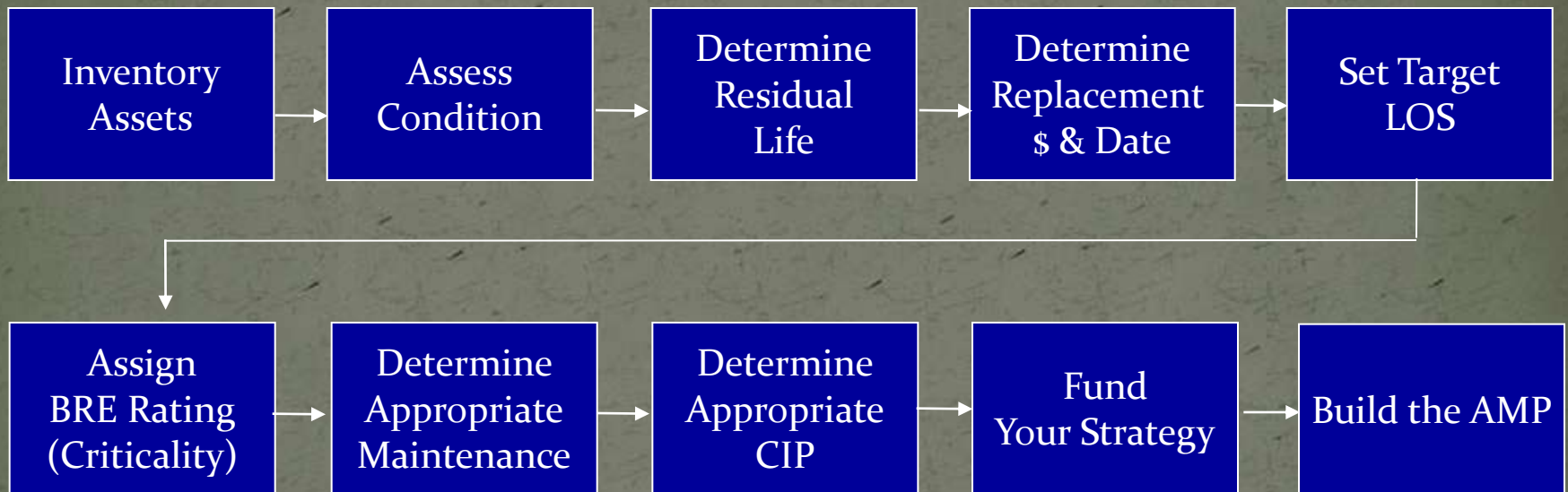
B

- Survey
 - All energy consuming devices
- Select Items
 - At the end of their useful life
 - Inefficient as compared to current tech
 - Expensive maintenance
- Prioritize
- Procure

Projects

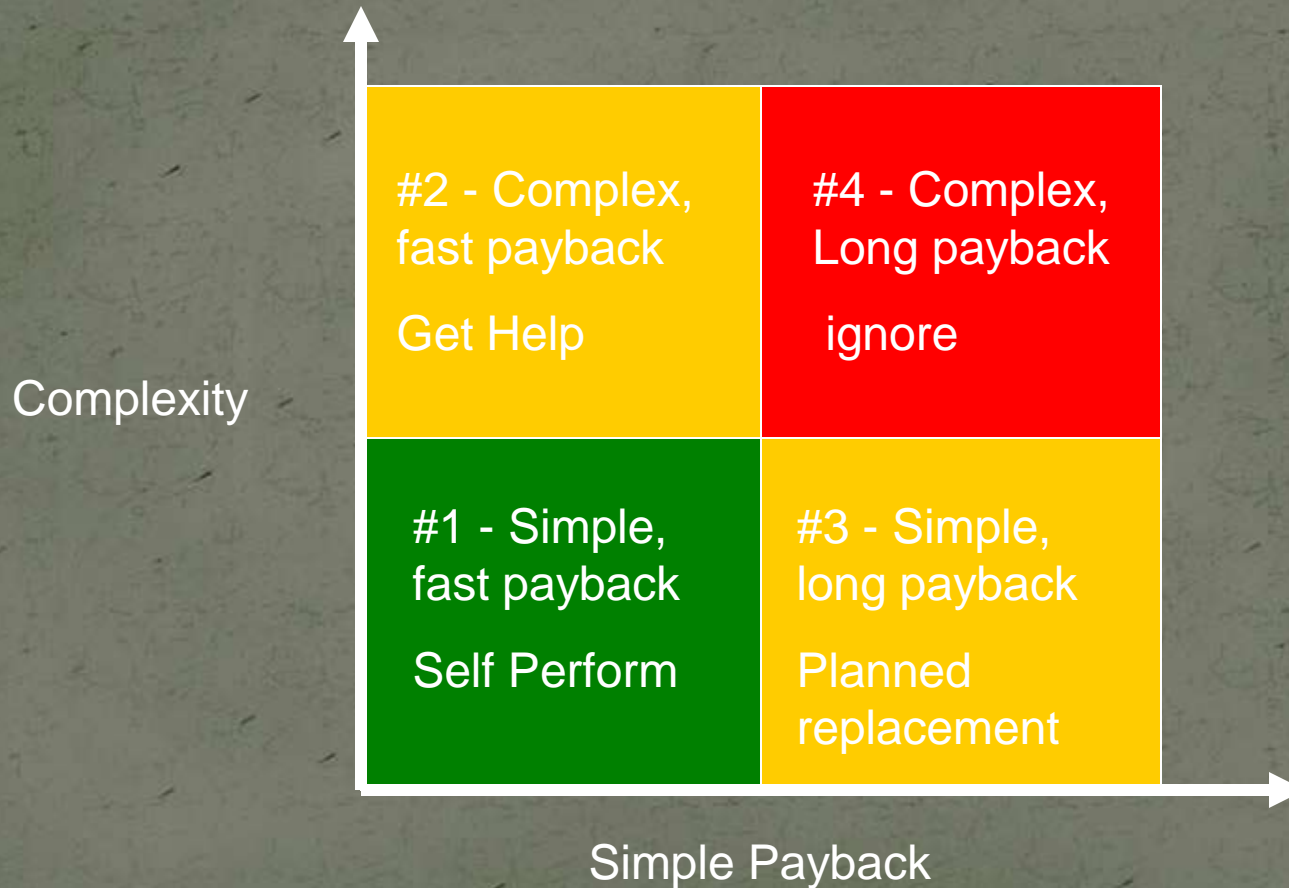


Asset Management Model



Prioritize

B



Programs



- Auditing
 - Data gathering is labor intensive
 - How to automate it?
- Modeling
 - What if analysis
 - Simple spreadsheets
- Training
 - Gap analysis
 - Energy conservation
 - Self-perform work
- Outsourcing
 - When to get help?

Financing



- How do pay for it?
- Internal
 - Capital Improvement Fund
 - Maintenance
- Grants
- External
 - Bonding
 - Zero interest loans
- Third Party
 - Guaranteed Savings Contracts

Strategic Energy Master Plan

- The plan will lay out some goals, and actions for the next few years
- Communicate to management, staff and public
- Review it as utility costs or regulations change

By the time you are done you will not need it, because it will be in your head.

Supply		Utilization	Information	Alternatives
Utilities		Projects	Programs	Financing
Gas Electric Water/Sewer		Asset Modernization Energy Projects	Auditing Modeling Training Outsourcing	Grants Leases Project Financing ESPC
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Energy Baseline Study For Municipal Wastewater Treatment Plants, September 2006 (Base Energy Inc)

Technology (99 plant sample size)		# of Plants	Percentage
Variable Frequency Drives (VFD)		60	61 %
VFD Applications	Pumps	55	56 %
	Blowers	12	12 %
	Compressors	3	3 %
	Other	13	13 %
Dissolved Oxygen (DO) Sensors		29	29 %
Advanced Instrumentation/ SCADA systems		47	47 %
High Efficiency Lighting		32	32 %
Solar Aerators or Mixers		4	4 %
High Efficiency Blowers		13	13 %
Variable Intensity or UV Lamps		4	4 %
Pipe Internal Friction Reducing Coating		9	9 %
Screw Press for Sludge Dewatering		3	3 %
Centrifuge for Sludge Dewatering		12	12 %
Other		11	11 %

Questions?

THANK YOU!

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