



Achieving Success through Effective Resource and Waste Management Planning

Metropolitan Golf Links
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Why include resource and waste management planning in your budget?



- It's good for the environment and society
- It increases playability and the golf experience for your members and guests
- It can benefit your bottom line

What is involved with resource and waste management planning?

Thinking about the Triple Bottom Line: People, Profit, Planet



- Are there things you can do to benefit the community?
- Do your ideas help save operating expenses and bring savings to the bottom line?
- Are your ideas beneficial to the environment?

How do you develop a plan?

- Develop a list of ideas
- Find other people interested in ‘thinking green’
- Come up with goals
- Use tools to calculate the costs and benefits
- Discuss your plan with your budgeting committee

Ideas



Electrical consumption: types of lights; occupancy sensors; flow rates and water window; pump and sprinkler efficiency; timing of charging carts; HVAC timing and controls; windows/shades modifications to reduce HVAC needs



Water consumption: turf reduction; washing carts and equipment; dishwasher usage; thawing meat; restroom modifications



Waste reduction: implementing division of recyclables, compostable food and materials, and landfill items; double sided printing and copying; installing hand dryers in restrooms; use more compostable and recyclable items throughout clubhouse; encourage suppliers to reduce packaging materials



Petroleum : using electric vehicles, course routing, having crew travel together for jobs, turning off equipment, carpooling to work



People: ask for suggestions; be a leader and set a good example; engagement; establish green team; market core values; share initiatives with staff, guests, community, market

Tools to Calculate Cost Savings and Benefits



<http://www.webmath.com/kwh.html>

handymath.com
Solutions For Technicians

<http://www.handymath.com/cgi-bin/electric.cgi?submit=Entry>



<http://www.rapidtables.com/calc/electric/energy-cost-calculator.htm>



Your Course Name Here
Basic (Tier 1)

% of Emissions	
77.6%	ENERGY USE Add the energy use (kwh, therm, lbs) from every meter on your property:
7.3%	FERTILIZER USE Enter in your total annual fertilizer use (in pounds of particular nutrient, NOT formulated product) for the following:
0.9%	PESTICIDE USE Enter your total annual pesticide (active ingredient) use for the following:
14.2%	FUEL USE Enter the annual diesel and gasoline usage that is not included in 'Mileage' below:
0.0%	MILEAGE Add miles driven by all company owned vehicles:
SEQUESTRATION Enter in acreage amounts for the following areas. *Note: areas that have trees, shrubs, and native grass should be counted in each individual area.	
Managed Turf	70 acres
Native Grass	20 acres
Trees	5 acres
Shrubs	5 acres
Energy Use	598,208 kWh
Natural Gas	6,021 therms
Propane	1,827 lbs
Organic Nitrogen	0 lbs
Nitrogen	14,838 lbs
Phosphorus	4,285 lbs
Potassium	8,940 lbs
Lime	14,750 lbs
Herbicides	300 lbs
Insecticides	0 lbs
Fungicides	250 lbs
Growth Regulator	18 lbs
Gasoline	6,540 gal
Diesel	1,828 gal
Mileage	mi
Total Emissions:	162.8 tons
Total Sequestration:	36.2 tons
Net Emissions:	126.6 TONS

Web and App tools help calculate savings

Using a tool like the Carbon Footprint Calculator, you will find the biggest opportunities are often electrical and fuel reduction!

Example: Carbon Footprint Calculator

Energy: 77.6% Fuel: 14.6%

Positive Net Emissions!

<http://www.staplesgolfdesign.com/water-and-energy/carbon-footprinting.aspx>



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Carbon Footprint Calculator version 1.0



Evaluate Every Departments Opportunities





Golf Operations	Clubhouse and Office	Food and Beverage	Golf Maintenance
Reprogram parking lot lights (decrease frequency)	Add plug load occupancy sensor power strips (10) to turn off small equipment	Add plug load occupancy sensor power strips (10) to turn off small equipment	Replace lights in maintenance building to T12 and add occupancy sensors
Replace HVAC usage by installing heavier shades in golf shop	Change computer power settings and/or turn off at night	Change computer power settings and/or turn off at night	Use goats to remove pampas grass on course
Install 4-6 solar tube lights in golf shop	Explore savings by adding thermostat control boxes around property	Explore savings by adding thermostat control boxes around property	Add electrical vehicles to maintenance fleet
Add solar panels to tops of golf carts	Clean vents and change to low resistance vents	Clean vents and change to low resistance vents	Turn of all equipment when not in use
Change when carts are charged to avoid peak pricing during the day	Replace existing faucets and toilets with low flow systems	Replace existing faucets and toilets with low flow systems	Create target green grass areas on driving range
Explore water reduction strategies in washing golf carts	Replace paper towel dispensers in each restroom with electric hand dryer	Replace paper towel dispensers in each restroom with electric hand dryer	Implement sorting for recycling and food waste
Recycling sorting program for cart barn and golf shop	Change printing to double sided	Change printing to double sided	Evaluate opportunities to add worm bin for on-site composting





Example of Calculating One Department's Initiatives

Golf Course & Maintenance

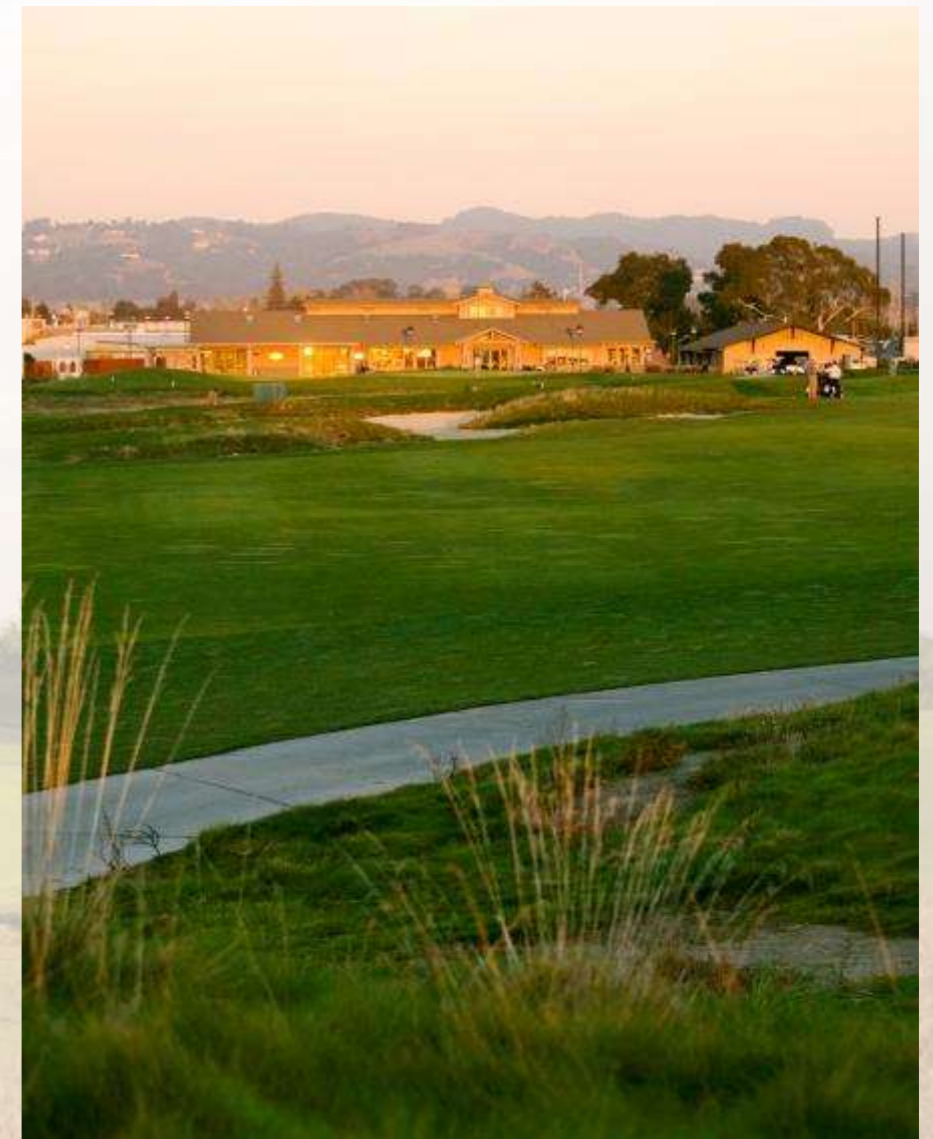
Area	Initiatives	Cost Savings	kWh/lbs/gallons	Other benefits/Notes	Behavior based? (Strategy)	Time
	Replace lights in maintenance building to T12 and add occupancy sensors	\$3,100	20,689 kWh		-	0-6 months
	Use goats to remove pampas grass on course	-	Carbon footprint	Reduced fuel and labor costs from using machinery	-	0-6 months
	Turn off equipment when not in use	\$1700	1.2 tons carbon	Less noise for guests on course and 418 gallons of fuel saved	Training, Signage	0-6 months
	Opportunities to replace gas equipment with electric equipment	TBD	TBD	Improve guest satisfaction and reduce carbon footprint	-	6-24 months
	Create target green grass areas on driving range	\$2100	18 acre ft. water, 10K kWh	Reduced labor, fuel, chemicals, and fertilizer needs	Signage for guests	0-6 months
	Implement sorting for recycling and food waste	-	500 lbs. of compost	Reduce compost and recycling from going to landfill	Training, signage	0-6 months
	Evaluate opportunities to add worm bin for on-site composting	TBD	TBD	Reduced costs for mulch, possible grants to build	-	6-24 months



Use the Tools to Calculate Potential Savings and Impact and begin writing plans into your budget

Potential Savings at Metropolitan Golf Links

- Total Initial Investment \$17,736
- Total First Year Savings: **\$43,042**
- Reduction impacts:
 - ✓ 208,397 kWh
 - ✓ 4 tons carbon footprint reduction
 - ✓ 3,347 lbs. of paper
 - ✓ 5.6M gallons of water
 - ✓ 13,837 lbs. of compost and recycling diverted from landfill.



Engagement Drives Results

Green Team

Meetings with Crew

Training

Buy in with other Departments

Budget Committee



Begin implementing ideas/plan!



Routinely Evaluate and Share Successes!

- Check in with your team and make adjustments to your plan
- Market your successes - important for our facilities and our industry!
- Discuss/educate resource and waste management with community
- Collaborate with others for continued growth and success





Thank you

