ORANGE WATER AND SEWER AUTHORITY

A public, non-profit agency providing water, sewer and reclaimed water services to the Carrboro-Chapel Hill community.

MEMORANDUM

TO: **Natural Resources and Technical Services (NRTS) Committee**
Heather Payne (Chair)
Terri Buckner
Dave Moreau
Ruchir Vora
John Young (*ex officio*)

THROUGH: Ed Kerwin

FROM: Ruth Rouse

DATE: August 19, 2016

SUBJECT: August 24, 2016 NRTS Committee Meeting

The NRTS Committee will meet on Wednesday, August 24 at 5:30pm in the OWASA Boardroom. Mary Tiger, Sustainability Manager, will present information regarding the Energy Management Program.

The meeting will be a discussion on the following topics:

1. Proposed Energy Management Program and Project Evaluation Framework (Attachment #1)
2. Proposed Stakeholder Engagement Plan for Energy Management Program (Attachment #2)
3. Merits of Incorporating the Social Cost of Carbon into the Project Evaluation Framework (Attachment #3)
4. Next Steps

The enclosed documents summarize a proposed approach to instituting an Energy Management Program at OWASA that objectively and sustainably pursues the energy management goals and objectives set by the Board at its June 25, 2015 meeting. In additional to achieving these goals and objectives, staff designed the program to:

- Foster a clean energy culture at OWASA through employee engagement and continuous improvement and innovation,
- Ensure strategic and prompt pursuit of clean energy opportunities, and
- Pursue cost-effective clean energy strategies.

Additionally, the draft Stakeholder Engagement Plan provides a summary-level plan for engaging stakeholders in the finalization of the Energy Management Program design, as well as in its ongoing implementation. In the Stakeholder Engagement Plan, there are references to supplemental Community Engagement Plans that may be warranted by high-profile, community-

oriented clean energy projects and/or the establishment and use of a social cost of carbon in the business case evaluation of clean energy opportunities.

In support of this last point, Attachment #3 summarizes the Federal Government's approach and estimates for a social cost of carbon that attempts to capture the social benefit of reducing carbon emissions. The Federal Government's approach in estimating and use of the social cost of carbon to evaluate the costs and benefits of its regulations was recently upheld by the United States Court of Appeals for the Seventh Circuit. A key policy consideration in OWASA's decisions as to whether or not to proceed with certain clean energy projects will be if and what to include as a "credit" for the social cost of carbon in our business case evaluations. Doing so would expand the extent of clean energy projects we can "cost-effectively" pursue, but will not result in actual financial savings for our customers. It is our intention that the Energy Management Program as described in the attached documents can proceed with or without the establishment and use of a social cost of carbon.

We welcome the NRTS Committee members' questions and feedback on the program design, and stakeholder engagement plan, as well as guidance for staff and the entire Board of Directors on if and how to proceed with the establishment of a social cost of carbon.

We look forward to seeing you on August 24, 2016.

Ruth C. Rouse

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Ruth Rouse, AICP
Planning and Development Manager

c: OWASA Board of Directors
Robert Epting, OWASA General Counsel

Attachments

Attachment 1: Summary of Proposed Energy Management Program and Project Evaluation Framework
Attachment 2: DRAFT Stakeholder Engagement Plan for Energy Management Program
Attachment 3: Executive Summary from the Federal Technical Support Document on the Social Cost of Carbon

ATTACHMENT 1

Proposed Energy Management Program and Project Evaluation Framework

Timeline for Development of Energy Management Program and Plan

- August 24: Natural Resources and Technical Services (NRTS) Committee meeting to discuss proposed project evaluation framework and stakeholder engagement plan
- September 8: Board meeting to provide guidance on proposed project evaluation framework and stakeholder engagement plan
- December 8: Board meeting to approve evaluation framework, taking into consideration stakeholder feedback
- February 9: Board to review draft Energy Management Plan
- February 23 (or later if necessary): Board to approve Energy Management Plan

Definitions

- Energy Management Program: OWASA's approach for identifying, evaluating, prioritizing, and tracking clean energy projects
- Energy Management Plan: The primary document that describes the policies, procedures, employee education and awareness, and actions and investments that together comprise our Energy Management Program; updated annually
- Implementation Plan: Proposed actions and strategies, timetable, resource requirements, and expected outcomes; updated annually as a component of the Energy Management Plan
- Clean energy project: An energy management, energy efficiency, or renewable energy project

Energy Management Goals and Objectives

Set by OWASA Board of Directors in June 2015

1. Reduce use of purchased electricity by 35% by the end of Calendar Year (CY) 2020 compared to CY 2010 baseline
2. Reduce use of purchased natural gas by 5% by CY 2020 compared to CY 2010 baseline
3. Beneficially use all wastewater treatment plant (WWTP) biogas by 2022, provided the preferred strategy is projected to have a positive payback within the expected useful life of the required equipment
4. Formally engage local governments and partners in discussion about potential development of a biogas-to-energy project at the Mason Farm WWTP
5. Seek proposals for third-party development of renewable energy projects on OWASA property

Energy Management Program Goals

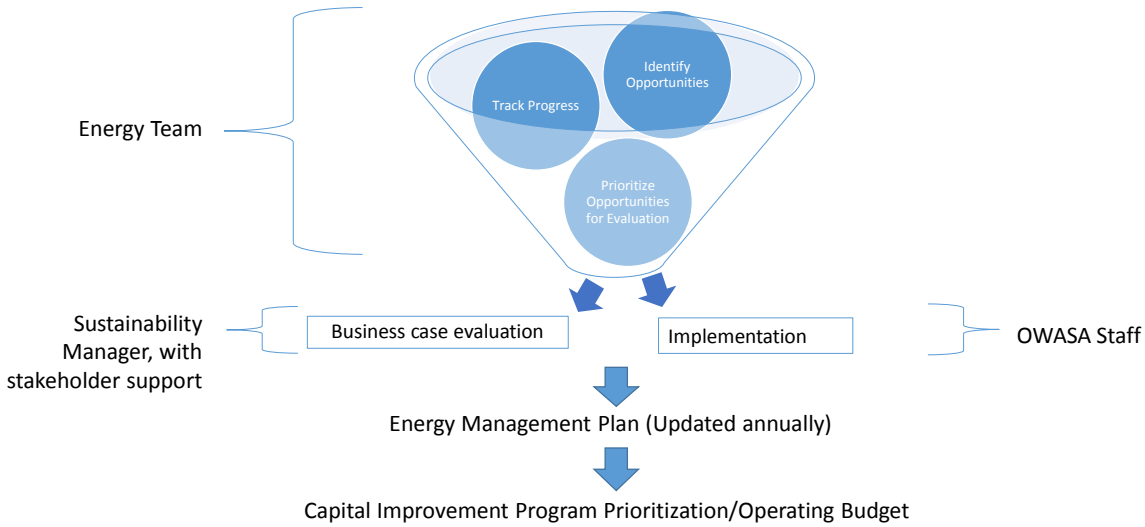
Defined by OWASA Staff

- Achieve energy management goals and objective set by Board of Directors
- Foster a clean energy culture at OWASA through employee engagement and continuous improvement/innovation
- Ensure strategic and prompt pursuit of clean energy opportunities
- Pursue cost-effective clean energy opportunities

Basic Components of an Energy Management Program

1. ✓ Establish Organizational Commitment and Set Goals and Objectives
2. ✓ Develop a Baseline of Energy Use
3. Evaluate the System and Collect Data (In progress)
4. Identify Clean Energy Opportunities (In progress)
5. Prioritize Opportunities for (further) Evaluation or Implementation
6. Evaluate Opportunities
7. Fund and Implement Projects
8. Track Progress and Report

Energy Management Program (Ongoing Process)



Role of the OWASA Energy Team

- Represent diversity of perspectives and functions of OWASA
- Serve as energy management champions and liaisons

- Meet Quarterly
  - Track progress
  - Identify clean energy opportunities
  - Prioritize clean energy opportunities

- Assist Sustainability Manager in conducting business case evaluations

Prioritization Criteria

The following criteria will be used in prioritizing clean energy opportunities for implementation or more detailed business case evaluation. Staff seeks Board's feedback on the comprehensiveness of these criteria.

- Financially Responsible (High level)
- Realistic/Implementable
- Operational Impacts
- Energy/Carbon Reduction Potential
- Coordinates with Other Projects
- Community Impacts

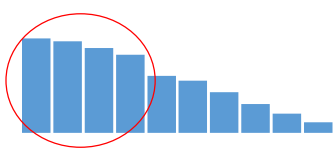
Incorporates criteria from:

- Project objectives defined in OWASA's Energy Management Program's Project Charter
- City of Raleigh's Climate and Energy Action Plan
- City of Asheville's Sustainability Management Plan
- Department of Energy's Guide to Community Energy Action Planning

Potential Prioritization Framework

December 8: Staff seeks Board's guidance on the weight to apply to each criteria with consideration of staff input.

Criteria	Weight	x	Qualitative Score				=	Weighted Score
Financially Responsible (High Level)	TBD	1	2	3	4	5		TBD
Realistic/Implementable	TBD	1	2	3	4	5		TBD
Operational Impacts	TBD	1	2	3	4	5		TBD
Energy/Carbon Reduction Potential	TBD	1	2	3	4	5		TBD
Coordinates with Other Projects	TBD	1	2	3	4	5		TBD
Community Impacts	TBD	1	2	3	4	5		TBD
	100%							Score



Projects and strategies where energy management is a secondary objective will be proposed in annual budget or implemented.

Projects and strategies that have a primary objective of achieving energy management goals will move to the next phase: business case evaluation.

Prioritization Criteria

- Financially Responsible (High level)
  - Good use of public funds
  - Financial viability of similar projects in similar organizations and circumstances
  - Opportunities for outside funding/financing
- Realistic/Implementable
- Operational Impacts
- Energy/Carbon Reduction Potential
- Coordinates with Other Projects
- Community Impacts

Prioritization Criteria

- Financially Responsible (High level)
- Realistic/Implementable
  - Degree to which strategy has been proven at a scale relevant to our operation
  - Organizational capacity to undertake and manage the project
  - Reasonable amount of staff time to implement
  - Legal
  - Meets regulatory requirements
- Operational Impacts
- Energy/Carbon Reduction Potential
- Coordinates with Other Projects
- Community Impacts

Prioritization Criteria

- Financially Responsible (High level)
- Realistic/Implementable
- Operational Impacts
  - Can be incorporated into the way OWASA does business
  - Degree to which strategy helps to resolve an existing or expected problem
  - Impact on safety, comfort, and productivity
- Energy/Carbon Reduction Potential
- Coordinates with Other Projects
- Community Impacts

Prioritization Criteria

- Financially Responsible (High level)
- Realistic/Implementable
- Operational Impacts
- Energy/Carbon Reduction Potential
  - Potential to reduce OWASA's energy use
  - Potential to reduce OWASA's carbon emissions
- Coordinates with Other Projects
- Community Impacts

Prioritization Criteria

- Financially Responsible (High level)
- Realistic/Implementable
- Operational Impacts
- Energy/Carbon Reduction Potential
- Coordinates with Other Projects
  - Part of a larger capital project
  - Synergy with other energy project (e.g. building envelope and HVAC)
- Community Impact

Prioritization Criteria

- Financially Responsible (High level)
- Realistic/Implementable
- Operational Impacts
- Energy/Carbon Reduction Potential
- Coordinates with Other Projects
- Community Impact
  - Stakeholder enthusiasm
  - Coordinates with community initiatives

Business Case Evaluation

- Conducted for projects requiring investment that are prioritized in preliminary evaluation
- Method: Life-cycle Cost Analysis
  - Threshold: Positive net present value
- Financial considerations (Compared against baseline)
  - Design and construction costs
  - Avoided cost of energy
  - Cost of operations and maintenance
  - Utility rebates and other incentives
  - Policy Question: Do we incorporate a social cost of carbon into the business case evaluation?
- Clean energy projects that surpass the business case threshold will be prioritized in OWASA's Capital Improvement Program or proposed in our annual Operating Budget

What is Social Cost of Carbon?

What is the social cost of carbon between where we are and where we want to be in 2020? And how (at a "back of the envelope" level) does that cost translate to our customers?

Estimate for social cost of carbon (Source)	Annual cost of carbon to meeting OWASA's energy targets	Monthly cost per meter equivalent
$4.50/short ton (Regional GHG Initiative of the Northeast and Mid-Atlantic States)	$3,976	$0.0112
$13/metric ton (California Air Resources Board)	$10,420	$0.0293
$36/metric ton (Federal Inter-Agency Task Force)	$28,855	$0.0812

OWASA's Energy Management Program
Stakeholder Engagement Plan
DRAFT – August 2016

Engaging stakeholders in OWASA's Energy Management Program will be critical to its success. Stakeholder participation in the development of the framework that is used to evaluate and prioritize clean energy projects, as well as in the ongoing implementation of the program, will help ensure a high-impact program consistent with the values of OWASA and the community we serve. Additionally, the summary of the Program and its progress, as captured in an annually updated Energy Management Plan, will provide timely information to stakeholders.

The OWASA Board of Directors has set the course for OWASA's Energy Management Program by formalizing our organizational commitment to and setting goals and objectives for energy management. OWASA Staff have compiled a historical assessment of energy use, and 2010 was selected as the baseline year against which our future progress will be evaluated. The following plan summarizes stakeholder engagement in steps 3 through 8.

Basic Components of an Energy Management Program
1. Establish Organization Commitment and Set Goals
2. Develop a Baseline of Energy Use
3. Evaluate the System and Collect Data
4. Identify Clean Energy Opportunities
5. Prioritize Opportunities for Evaluation or Implementation
6. Evaluate Opportunities
7. Fund and Implement Projects
8. Track Progress and Report

In accordance with the Board-approved guidelines for community engagement plans, the following plan proposes groups of stakeholders to OWASA's Energy Management Program and the core message for each group. It proposes outcomes/objectives, strategies for engaging each group, and methods for measuring the effectiveness of that engagement. Additionally, it describes the formation of a new group of stakeholders: an OWASA Energy Team.

Stakeholder Definition and Analysis

OWASA Customers: OWASA exists to serve our customers, and we aspire to reflect the community's values. As such, the evaluation framework we use in our energy management program should strive to reflect our community's balance of environmental, economic, and social values. By instituting an official Energy Management Program, we ensure a strategic and transparent approach to energy management at OWASA.

Core message: OWASA believes that enhancing energy use sustainability and reducing our greenhouse gas emissions is beneficial to our community, state, and nation, and is an important priority of our community. We are actively pursuing cost-effective strategies for doing so.

OWASA Board of Directors: The Board of Directors has established overall goals and objectives for OWASA's Energy Management Program. In establishing (and revising as appropriate) the framework used by staff to prioritize and evaluate clean energy opportunities, they embed the Board's and our community's values into our decision-making. In its implementation, they have authority to fund initiatives to meet those objectives as part of OWASA's overall budget.

Core message: OWASA is actively and strategically pursuing clean energy projects that reflect the Board's values and priorities.

OWASA Staff: OWASA employees are on front-lines of our energy use and management. They stand in the best position to identify opportunities and successfully implement strategies to meet our energy management objectives.

Core message: You can help OWASA lead the way in protecting the environment and saving money by continuously seeking opportunities to decrease our use of purchased energy.

OWASA Energy Team: The Energy Team will serve as a new and important sub-set of OWASA employees. The team will be comprised of a diverse group volunteers from across the organization. Led by OWASA's Sustainability Manager, this team will be the most engaged group of individuals in identifying, evaluating, and monitoring OWASA's clean energy projects. This team is described in more detail later in the document.

Core message: Your engagement on the Energy Team ensures that we do the right projects and do those projects right.

Consultants Hired by OWASA: OWASA regularly works with engineering firms and other consultants to design and build our energy-using infrastructure. By highlighting our energy management goals and objectives to those with whom we work, we help ensure those goals and objectives are embedded in their work, as well.

Core message: OWASA is committed to a systems thinking approach to our use of energy and open to evaluating out-of-the-box strategies in reducing it.

Technical Assistance Providers: There are a host of low-to-no cost technical assistance providers that can help us identify and evaluate clean energy projects, including federal agencies (e.g. Department of Energy, specifically resources from the Better Plants Program), state agencies (e.g. State Energy Office), non-profit organizations, and academic groups. Engaging these groups helps to bring in outside expertise and the opportunity for partnership and leadership.

Core message: OWASA is open to learning from others on how to achieve our energy management goals and welcomes others to learn from us.

Inter-Local Clean Energy Working Group: For the past year, OWASA has convened a group of staff from agencies in the region to identify collaboration opportunities for energy management. This group includes the University of North Carolina, the Towns of Chapel Hill and Carrboro, Orange County, and the Chapel Hill-Carrboro City Schools. In addition to the staff of these organizations, their Boards and leaderships are important stakeholder to our programs and, potentially, some of the clean energy opportunities we pursue.

Core message: OWASA is committed to working collaboratively with our regional partners to help improve the efficiency, impact, and community involvement in achieving common objectives.

Engagement Outcomes/Objectives and Strategies

Stakeholder Group	**Engagement Outcomes/Objectives** *(Italics indicate early engagement in evaluation framework development)*	**Engagement Strategies** *(Italics indicate early engagement in evaluation framework development)*
OWASA Customers	*Solicit feedback on willingness-to-pay for social cost of carbon (if necessary)* Provide balanced, objective, accurate, and consistent information to assist in the community's understanding of OWASA's commitment to and pursuit of energy management and sustainability To solicit input on the design and implementation of high-profile, community-oriented projects	*Implementation of community engagement plan regarding social cost of carbon (TBD in separate community engagement plan, if necessary)* Active promotion (i.e. newsletter, website, outreach presentations) of an annually updated Energy Management Plan, including the use and documentation of an evaluation and prioritization framework and progress against energy management goals and objectives Energy metric on KPI Dashboard published on website (updated monthly) Engagement in the exploration and analysis of high-profile, community-oriented clean energy projects (TBD in project specific community engagement plan)
OWASA Board of Directors	*Establish evaluation and priority framework for energy management program* Ensure alignment of clean energy projects with other initiatives Provide funding to achieve energy management objectives	*Meetings with NRTS Committee and OWASA Board of Directors* Annual delivery of updated Energy Management Plan, including the use and documentation of an Board-approved evaluation and prioritization framework and progress against energy management goals and objectives Energy metric on KPI Dashboard emailed monthly Engagement in the design, analysis, and exploration of high-profile, community-oriented clean energy projects
OWASA Staff	*Solicit input on prioritization criteria for the Board's consideration* *Build support for the energy management program*	*Conduct interactive sessions at staff meetings on energy management program* *Invite participation in Energy Management Team (annually)*

	Inspire energy management problem-solving Ensure successful clean energy projects by identifying and resolving concerns regarding projects Empower staff to make process and operational changes and bring forward projects to meet energy management objectives	Accessible, integrated, and actionable energy data (monthly, daily, hourly) Provide job-relevant energy management workshops (on-going)
OWASA Energy Team	*Solicit input on prioritization criteria for the Board's consideration* Serve as organizational champions of and liaisons for energy management Actively seek energy management solutions; Evaluate clean energy projects Empower staff to make operational changes and bring forward projects to meet energy management objectives	*Meeting to propose weights for prioritization criteria* Quarterly meetings to review energy use and to identify and prioritize energy management strategies (ongoing) Assistance in business case review of clean energy opportunities (ongoing)
Consultants	Obtain feedback and insight on OWASA's energy use and strategies to meet energy management objectives	Identify energy reduction as primary or secondary objectives of relevant capital projects (ongoing) Hire to conduct energy assessments and audits of OWASA facilities and functions (ongoing)
Technical Assistance Providers	Obtain feedback and insight on OWASA's energy use and strategies to meet energy management objectives	Invite feedback from technical assistance providers (ongoing) Participate in Better Plants Challenge (ongoing) Participate in NC Water and Wastewater Energy Efficiency Initiative (ongoing)
Inter-Local Clean Energy Working Group	*Collaboration on community engagement regarding establishment and use of a social cost of carbon (if necessary)* Partner on the exploration and development of clean energy strategies Gain support and buy-in for our efforts from public officials	*Implementation of community engagement plan regarding social cost of carbon (TBD in separate community engagement plan, if necessary)* Host periodic meetings to foster the identification and pursuit of collaborative initiatives Engage in the exploration and analysis of high-profile, community-oriented clean energy projects

OWASA Energy Team

Energy affects many aspects of our utility from design to finance to operations. The OWASA Energy Team will represent a diversity of perspectives and insight from across organizational functions, including operators, maintenance staff, engineers, administrators, and financial advisors. Energy team members will serve as department champions and liaisons for energy management. Maintaining an active energy team will help ensure that energy management remains on the forefront of organizational strategies. OWASA's Sustainability Manager will serve as the point person for facilitating the team's activities and delegating responsibilities to others.

Energy Team members will contribute to the program in the form of time and expertise. It is anticipated that this group will meet quarterly throughout the year to discuss detailed trends in energy use, to track and monitor the performance of clean energy projects, to brainstorm and identify clean energy project ideas, and to prioritize those project ideas against the Board-approved evaluation framework. Additionally, individual members of the energy team will assist the Sustainability Manager in the business case evaluation of clean energy projects, where appropriate.

Measuring Effectiveness of Stakeholder Engagement

As critical parts of a successful Energy Management Program, the ultimate measurement of the effectiveness of our stakeholder engagement will be continuous progress towards and ultimate achievement of our energy management goals and objectives.

We will report on the number and extent of engagement efforts made throughout the program and report on them annually in the Energy Management Plan. Additionally, throughout the engagement, we will seek feedback on the quality and timeliness of information and engagement opportunities. We will seek such feedback through

- Meetings and conversations with one person or a small group of people (Staff, Energy Team, Board Members, Consultants, Technical Assistance Providers)
- Informal surveys (Inter-Local Clean Energy Working Group, Consultants, Technical Assistance Providers)
- Focus groups (Customers)
- Formal surveys (Customers)

Technical Support Document: -
Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis -
Under Executive Order 12866 -

Interagency Working Group on Social Cost of Carbon, United States Government

With participation by

Council of Economic Advisers
Council on Environmental Quality
Department of Agriculture
Department of Commerce
Department of Energy
Department of Transportation
Environmental Protection Agency
National Economic Council
Office of Management and Budget
Office of Science and Technology Policy
Department of the Treasury

May 2013

Revised July 2015
See Appendix B for Details on Revision

Executive Summary

Under Executive Order 12866, agencies are required, to the extent permitted by law, "to assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs." The purpose of the "social cost of carbon" (SCC) estimates presented here is to allow agencies to incorporate the social benefits of reducing carbon dioxide (CO_2) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions. The SCC is an estimate of the monetized damages associated with an incremental increase in carbon emissions in a given year. It is intended to include (but is not limited to) changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change.

The interagency process that developed the original U.S. government's SCC estimates is described in the 2010 interagency technical support document (TSD) (Interagency Working Group on Social Cost of Carbon 2010). Through that process the interagency group selected four SCC values for use in regulatory analyses. Three values are based on the average SCC from three integrated assessment models (IAMs), at discount rates of 2.5, 3, and 5 percent. The fourth value, which represents the 95th percentile SCC estimate across all three models at a 3 percent discount rate, is included to represent higher-than-expected impacts from temperature change further out in the tails of the SCC distribution.

While acknowledging the continued limitations of the approach taken by the interagency group in 2010, this document provides an update of the SCC estimates based on new versions of each IAM (DICE, PAGE, and FUND). It does not revisit other interagency modeling decisions (e.g., with regard to the discount rate, reference case socioeconomic and emission scenarios, or equilibrium climate sensitivity). Improvements in the way damages are modeled are confined to those that have been incorporated into the latest versions of the models by the developers themselves in the peer-reviewed literature.

The SCC estimates using the updated versions of the models are higher than those reported in the 2010 TSD. By way of comparison, the four 2020 SCC estimates reported in the 2010 TSD were $7, $26, $42 and $81 (2007$). The corresponding four updated SCC estimates for 2020 are $12, $43, $64, and $128 (2007$). The model updates that are relevant to the SCC estimates include: an explicit representation of sea level rise damages in the DICE and PAGE models; updated adaptation assumptions, revisions to ensure damages are constrained by GDP, updated regional scaling of damages, and a revised treatment of potentially abrupt shifts in climate damages in the PAGE model; an updated carbon cycle in the DICE model; and updated damage functions for sea level rise impacts, the agricultural sector, and reduced space heating requirements, as well as changes to the transient response of temperature to the buildup of GHG concentrations and the inclusion of indirect effects of methane emissions in the FUND model. The SCC estimates vary by year, and the following table summarizes the revised SCC estimates from 2010 through 2050.

Revised Social Cost of CO_2, 2010 – 2050 (in 2007 dollars per metric ton of CO_2)

Discount Rate Year	5.0% Avg	3.0% Avg	2.5% Avg	3.0% 95th
2010	10	31	50	86
2015	11	36	56	105
2020	12	42	62	123
2025	14	46	68	138
2030	16	50	73	152
2035	18	55	78	168
2040	21	60	84	183
2045	23	64	89	197
2050	26	69	95	212