Development of a Carbon Calculator Tool

Description: Develop a carbon calculator tool to compare greenhouse gas (GHG) emissions for various construction and maintenance activities.
Status: Tool is under development.

BENEFITS

NYSEARCH and the North American Society for Trenchless Technology (NASTT) have partnered to address areas in pipeline construction and gas operations that need more attention when calculating greenhouse gas emissions. This interest stems from regulations that now require specific reporting of greenhouse gas (GHG) emissions but also an interest in comparing various pipeline construction, rehabilitation and operating activities. This will enable pipeline operators to develop detailed cost/benefit analysis of various operations and their impact on a company's greenhouse gas/carbon footprint (Figure 1).
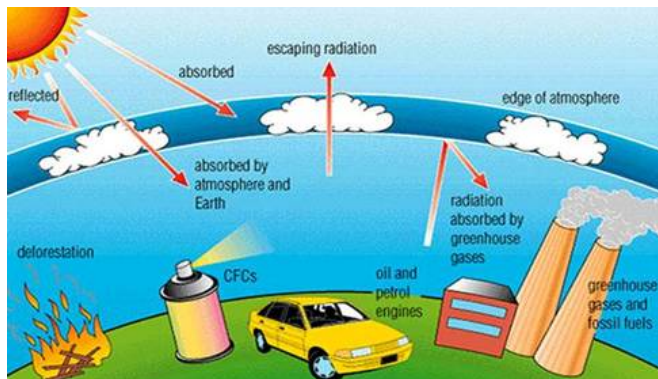

Figure 1: Greenhouse Gas Emission Sources

It is expected that by developing a spreadsheet/software tool to assess GHG emissions for various activities, operators and construction supervisors can make better decisions to reduce gas emissions when selecting construction and maintenance options.

BACKGROUND

Stakeholders such as regulators, non-governmental organizations, communities, clients and employees are taking an increasing interest in the carbon footprint of routine industrial activities. By quantifying a carbon footprint, producers have quantitative data that enables them to better manage operational risks by: 1) reducing the carbon footprint which translates to reduced energy use and reduced costs; 2) supporting emerging regulations for air permitting and emissions reporting; and 3) enhancing stakeholder trust in environmental stewardship efforts.

Increasingly, companies and local governments are asked to consider the carbon impact of their activities. While there are a number of emission factors and generic carbon calculators available through published documents and Internet resources, the quality of some data is suspect. Additionally, specific carbon emissions data has not been assembled into one tool to readily address operations unique to NASTT and NYSEARCH member operations.

TECHNICAL APPROACH

The overall goal of the project is to create a tool that can conveniently and accurately calculate the GHG emissions associated with operations, maintenance and construction activities that occur to sustain the underground infrastructure (associated with natural gas, sewer and water). The data used to calculate emissions in the tool must be adequately robust to represent likely project emissions. By coupling the tool with selected validation tests, users of the tool will better understand the real impact of the carbon output of various infrastructure activities, such as Horizontal Directional Drilling (HDD), Cured-In-Place Lining, and Pipe-Splitting.

One specific objective is to create a robust, user-friendly spreadsheet tool that calculates the GHG emissions (carbon) footprint for selected gas construction and operations activities. The contractor, Eta/Environ is using knowledge and information from an EPA non-road model and other models known to researchers in this area. Also, Eta/Environ is obtaining emissions data from raw material production, equipment fuel usage and other equipment operations. For data that cannot be obtained from existing sources, NYSEARCH/NASTT participants are providing specific usage and emissions data for each activity and task. The spreadsheet tool will be verified through field tests. There are also plans to transfer the carbon calculator to a software tool (Figure 2).

Figure 2: Example of Tool Input

The project scope addresses work in two areas: 1) pressurized pipe with diameter of 12" or less, and, 2) non-pressurized pipe (sewer, water) with diameters of 36" or less (non-pressurized pipe being the primary interest of the members of NASTT).

The project has three major tasks: 1) conduct a data gathering effort with various subject matter expert (SME) participants to create an overall spreadsheet design; 2) study, identify, verify and compile data for input to the spreadsheet for the selected work activities; 3) develop a fully operable spreadsheet tool and training module that will be acceptance tested by company users (Figure 3).
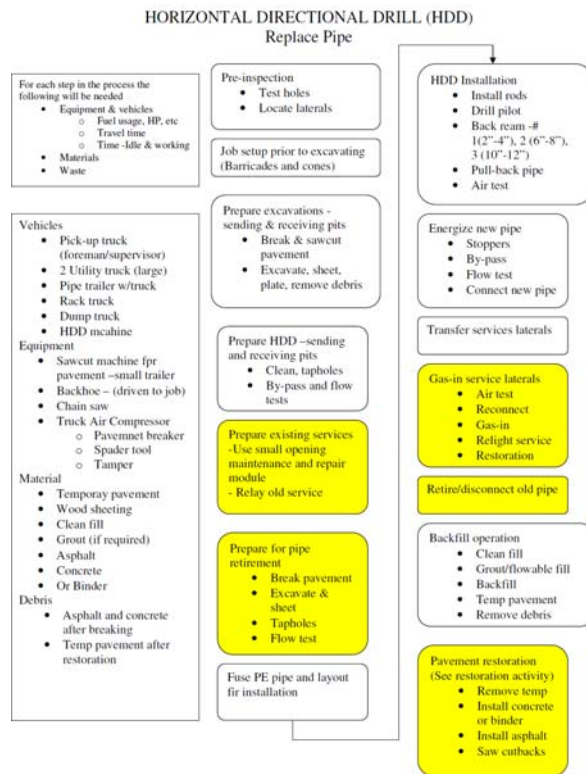

Figure 3: Example of Data HDD Flow Chart

Eta Partners is developing a report/roadmap which defines how to convert the spreadsheet tool to a commercial software package. Training is also being provided.

PROGRAM STATUS

The spreadsheet tool is currently under development. Eta/Environ is working closely with NYSEARCH member gas companies and NASTT representatives in identifying work task details, equipment and raw materials for each assigned activity.

Highlights

- Detail specific to GHG emissions
- Improve engineering decisions
- Improve cost/benefit analyses
- Proactive approach to address future regulations
- Highlight use of trenchless technologies

For more information contact:
admin@NYSEARCH.org