SOW – Fleet Electrification Plan

*Instructions: Use this Scope of Work (SOW) template to help complete a Fleet Electrification Plan (FEP) application.* ***All text in red are instructions and must be deleted before submitting the SOW.***

*This template should be viewed as the minimum requirements – additions may be added, and the format, tasks, and layout of the SOW can be customized as long as the requirements of this template are still met.*

*Text that is highlighted, bolded, italicized, and in brackets* ***[like this example]*** *should be replaced by the information relevant to the specific applicant.*

# **Introduction:**

*The Introduction section should provide a brief overview of the consultant, any sub-consultants, school district, and other parties involved in the Fleet Electrification Plan.*

*If the applicant is a Priority District, or consultant on behalf of a Priority District, the application is through NYSERDA’s Clean Green Schools Initiative. If the applicant is for a non-Priority District school district or a school bus contractor, the application is through NYSERDA’s FlexTech Program.*

***[Describe the reasons for doing this study ie. Statewide school bus requirements, school district goals, contractor goals, long-term planning desires, costs, etc.]***

This scope of work describes the services and tasks that shall be performed by ***[Consultant/Contractor Firm]***, “the Consultant,” in conducting a Fleet Electrification Plan through NYSERDA’s ***[FlexTech Program/Clean Green Schools Initiative]*** for ***[Applicant School District]***, “the Customer”. ***[If applicable, mention any sub-consultants that are part of the study, and their role].***

***[Describe the Intent of Study in 3-5 sentences]***

# **District, Fleet, and Facility Description:**

*Complete and/or modify the following descriptions to meet the specifics of your project.*

***[District Description: Insert a brief description of the School District. This could include the town(s) it serves, the county it is located in, the number of schools it serves, the annual budget, total number of students, total staff, and whether the District is High Needs/DAC/Priority]***

*Describe the school bus fleet that will be the focus of this Fleet Electrification Plan. Include, at a minimum, the following:*

* *Number of buses*
* *General uses of buses*
* *Types of buses (Type A, B, C, etc.)*
* *If any buses are already electrified or low-/zero-emission*

***[Fleet Description: State the number of buses, where they are stored, including the address, the type(s) of buses, typical uses, and if any buses are already electric/zero-emission]***

*If the study includes multiple buildings or bus depots, provide a table that lists each building to be analyzed through the study. The information included in the table below should be included for each building, to the extent possible.*

# *Please note if there are any existing EV chargers on site.*

***[Facility Description: Briefly describe where the buses are domiciled, including the address. If multiple locations, include the number of buses stored at each. Descriptions should include at minimum the address of the site, number of buses domiciled there, and the name of the Utility provider. Descriptions could also include a list of other building uses like office space or training, as well as the annual utility costs for the District and for the School/Depot where the buses are stored]***

# **Tasks and Deliverables:**

*Project tasks should be itemized, and a corresponding deliverable must be identified for each task. For each task, include the minimum requirements indicated by the instructions. Tasks can be regrouped or rearranged if the minimum requirements are still met. Additional tasks can be added as needed.*

*If the consultant is utilizing any sub-contractor(s), please clearly indicate which party (Prime Contractor, Sub-Contractor(s)) will be completing each indicated task.*

***Please delete all instructions before submitting the SOW.***

## Task 1: Project Kickoff and Client Meetings

**Scope:**

* Kickoff meeting
	+ ***[Indicate whether this will be virtual or on-site/in-person]***
	+ ***[Ensure the Utility is invited to this meeting as an optional participant]***
* Site Survey
	+ ***[Indicate whether this will be in-person or virtual via site plans. If in-person, state whether it will be the same date as the Kickoff meeting]***
* Client Meetings
	+ ***[Indicate whether Client Meetings will occur after specific Tasks or on a recurring basis]***
	+ ***[Indicate whether Client Meetings will be in-person or virtual]***

**Deliverable:**

Meeting minutes.

## Task 2: Data Collection

*Include the following minimum data collection items and clarify the Deliverable for this task. Include a brief paragraph describing the purpose of this task. If there are multiple consultants/sub-consultants please indicate which party will be delivering this task.*

**Scope:**

Coordinate with District/Utility to collect:

* Bus fleet information – number of buses (current/projected), bus types/size, replacement schedule
* Bus schedules and routing data
* Bus parking/storage arrangements
* Fueling – current operational requirements
* Utility data – name, existing service size and voltage, contact
* Existing distribution data – capacity, condition, expansion capability, as-built electrical one-lines
* Existing site plan(s)
* ***[Other data as needed]***

**Deliverable:**

Summary of findings and data gaps as a specific chapter in the study report.

## Task 3: Route Analysis & Bus Technology Assessment

*Include the following minimum route analysis and bus technology assessment items and clarify the Deliverable for this task. Include a brief paragraph describing the purpose of this task. If there are multiple consultants/sub-consultants please indicate which party will be delivering this task.*

**Scope:**

Required:

* Analyze available bus route data for time and distance to understand range and energy requirements by route
* Factor in climate, topography, and driving conditions
* Define specification bus typology requirements for each bus route and recommend minimum battery requirements
* Compare at minimum 2 different bus manufacturers to indicate different technology options

Optional:

* Use up to 4 bus manufacturer/types of buses to analyze performance
* For cold climates, assess the need for auxiliary heating (short-term fuel-fired heaters or long-term heat pups or fuel-cell heaters)
* ***[Additional tasks as discussed with the Client]***

**Deliverable:**

A combination of written report, charts, graphs, and tables that clearly describe the methodology, assumptions, inputs, and outputs of the analysis.

## Task 4: Conceptual Charging Strategy

*Include the following minimum conceptual charging strategy items and clarify the Deliverable for this task. Include a brief paragraph describing the purpose of this task. If there are multiple consultants/sub-consultants, please indicate which party will be delivering this task.*

**Scope:**

* Develop a charging strategy based on the routing requirements, energy needs, and recommended battery size in Task 2. The charging strategy shall include the following:
	+ Charger power ratings(s)
	+ Quantity of chargers (by type if multiple types)
	+ Up to 3 scenarios with different charger power ratings and/or charging windows (i.e. no mid-day charging, L2-only, unmanaged vs. managed)
	+ Analysis on impact of bus type/size on charging strategy
	+ Proposed charging profile for all buses
* Identify peak demand during on-peak and off-peak times as well as total kWh utilized
* Recommend charging strategy including charger types, quantities, and charging times

**Deliverable:**

A combination of written report, charts, graphs, and tables that describe the recommended charging strategy as well as the implications/constraints of the charging strategy on bus operations and routes.

## Task 5: Electric Utility Analysis

*Include the following minimum electric utility analysis items and clarify the Deliverable for this task. Include a brief paragraph describing the purpose of this task. If there are multiple consultants/sub-consultants, please indicate which party will be delivering this task.*

**Scope:**

Required:

* Conduct initial outreach with school district’s utility provider
* Submit a work request to the Utility for the full energy needs required in 2035
* Hold a meeting with the Utility, School District, NYSERDA, and Consultant
* Complete or update the [fleet assessment questionnaire](https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fjointutilitiesofny.org%2Fev%2Fmake-ready%2Ffleet-assessment&data=05%7C02%7CVincent.Riscica%40nyserda.ny.gov%7C89d1b3d0caa44dac2e6608dc8a476f84%7Cf46cb8ea79004d108ceb80e8c1c81ee7%7C0%7C0%7C638537289122754547%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=eAQpfHDG%2FDqd8PPvN8A62hPFTxe2uFYyY8H9JgvQiK8%3D&reserved=0) on behalf of district based on Task 2 and 3 results
* Obtain an understanding of the Utility provider’s ability to meet the required power demand from bus charging determined in Tasks 2 and 3
* Work with the utility to determine the overall equipment needs and costs, as well as the breakdown of costs (utility-side as opposed to customer-side costs)
* Incorporate a rate analysis (to be completed by the Utility), which summarizes the rates and rebates available, and is included in the final cost estimates
* Identify any mitigation measures needed if power cannot be supplied, or if cost/time constraints related to installing required infrastructure will impact the fleet transition timeline. Possible mitigations include:
	+ Alternative connection requests (upgrade vs. new service)
	+ Incorporation of DERs on-site (solar, wind, battery storage, etc.)
	+ Temporary charging stations

Optional:

* Description of how multiple sites will be handled, if applicable
* Vehicle-to-Grid Charging Analysis
* Backup Power Analysis
* Microgrid Analysis

**Deliverable:**

A combination of written report, charts, graphs, and tables that clearly document communication with the Utility provider, current on-site infrastructure and power demand, description of the Utility’s ability to provide the required power, any new or upgraded service requirements, costs and constraints associated with any infrastructure upgrades, and mitigation measures as needed. Meeting minutes from the meeting with the Utility provider and the Client should be provided as an additional deliverable.

## Task 6: Concept Development & Phasing Plan

*Include the following minimum concept development and phasing plan items and clarify the Deliverable for this task. Include a brief paragraph describing the purpose of this task. If there are multiple consultants/sub-consultants, please indicate which party will be delivering this task.*

**Scope:**

* Select a preferred utility connection option and work with the Utility to identify locations for any onsite utility interface equipment
* Develop a concept-level site plan and one-line diagram detailing siting of customer-side equipment, chargers, and charging ports. The concept-level site plan will include:
	+ On-site distribution equipment including switchgear/panelboards, transformers, and wiring to the chargers
	+ Charger types, sizes, locations, and number of dispensers
	+ Dispenser connections to the bus fleet
* Identify capital works needed to install chargers
* Develop a vehicle replacement schedule indicating when specific buses and routes will be transitioned until the fleet reaches 100% zero-emission vehicles
* Develop a charger purchasing and installation schedule that aligns with the vehicle replacement schedule

**Deliverable:**

A combination of written report, charts, graphs, and tables that clearly indicate the proposed schedule for transitioning the fleet to 100% zero-emission vehicles by 2035, as well as a schedule for implementing the necessary infrastructure upgrades and charger installations to support these vehicles. Include the concept-level site plan and one-line diagram either in the report or a clearly indicated appendix of the report.

## Task 7: Transition Plan Cost Estimates

*Include the following minimum transition plan cost estimate items and clarify the Deliverable for this task. Include a brief paragraph describing the purpose of this task. If there are multiple consultants/sub-consultants, please indicate which party will be delivering this task.*

**Scope:**

Required:

* Develop a concept level cost estimate which details the following:
	+ Total anticipated costs:
		- Utility upgrades (utility- and customer-side)
		- Bus purchases
		- Charger purchases
		- Sitework and construction
	+ Work with the Client to determine the District share of specific costs:
		- Estimated utility upgrades and sitework
		- Estimated bus purchases
		- Estimated charger purchases
	+ A summary of state transportation aid changes and how they impact TCO
	+ A comparison to business-as-usual bus purchasing costs (how much would the district be spending on buying new diesel buses if they were to continue as normal)
	+ Identify and estimate the cost reduction potential of possible incentives
	+ Incorporate the rate analysis conducted by the Utility (as available)

Optional:

* Integrate upcoming capital projects to the schedule
	+ For districts with upcoming capital projects related to bus depots/facilities, identify opportunities for fleet electrification elements to be incorporated in the capital project to save the District time and money
* Calculate cost-savings from operating electric school buses and present a total cost of ownership (TCO) analysis including maintenance, fuel, workforce training, etc.

## [OPTIONAL] Task 8: Workforce Training Needs

*This task is optional and serves of an example of additional scope items that may be beneficial to the Client. Delete this task if not needed, or rework it to meet the needs of the specific study being conducted.*

*The following workforce training needs scope elements could be included in this task. Include a brief paragraph describing the purpose of this task. If there are multiple consultants/sub-consultants, please indicate which party will be delivering this task.*

**Scope:**

* Assess the district’s need for workforce training
* Identify potential workforce training programs
* Suggest a timeline for workforce training that aligns with the bus and charger procurement schedules from previous tasks

**Deliverable:**

Include a chapter in the Final Report with suggestions related to workforce development needs.

## Task 9: Final Report and Presentation

*Include the following minimum Final Report and presentation scope items and clarify the Deliverable for this task. Include a brief paragraph describing the purpose of this task. If there are multiple consultants/sub-consultants, please indicate which party will be delivering this task.*

**Scope:**

* Prepare a Final Report including all tasks from the SOW which summarizes the analyses completed and the recommended fleet transition plan
* Address comments from NYSERDA personnel as needed
* Prepare a Final Presentation for the Client to use as needed that includes an easy to understand description of the key takeaways, timelines, costs, and analyses conducted.
* Address comments from NYSERDA personnel as needed
* All Final documents will be created with the School District in mind, providing clear takeaways, actionable items, costs, and recommendations that can be disseminated to other School District decision makers and departments as needed.
* Final Draft revisions will be made until NYSERDA deems the Final Report satisfactorily complete.

**Deliverable:**

* Draft and Final Report
* Draft and Final Presentation

# **Assumptions:**

*Provide a list of assumptions relevant to the completion of this Fleet Electrification Plan. Note any information the Client has agreed to provide the Consultant for the completion of the study.*

*Examples of assumptions could include, but are not limited to:*

* *Fleet information will be provided by the Client, including current number of buses, age of buses, type of bus (number of seats and GVWR), number of bus routes, bus route distance, bus schedules, number of stops per route, and extra-curricular activities buses are currently provided support for (sports, field trips, weekend uses, etc.)*
* *Access to the site common spaces including utility meters, bus depot, parking lots, on-site electrical equipment, and mechanical rooms will be provided.*
* *Minimum of 1 year of preceding utility bill rates and usage will be required and utilized.*
* *Access to all available construction and design documentation including as-builts, MEP drawings, blueprints, schematics, specifications, etc.*
* *Bus operations and maintenance staff will be available for at least 1 conversation to discuss current procedures.*
* *Previous engineering studies, route analyses, charging analyses, or other work conducted in-house or by 3rd part service providers will be shared with the consultant.*
* *Task memos will be provided to the Client and NYSERDA as progress updates.*

It is assumed that there will be an active partnership between School District staff and the Consultant for the duration of the study. Fleet management/operations staff will be asked to be available to assist our engineering staff during the site visits and will be responsible for providing the following:

* ***[Insert Assumptions here. If using examples from above, please delete all red text instructions and include assumptions in this area. Add any additional assumptions as needed]***
* *Required:* The applicant shall address technical review comments from NYSERDA until the draft report is deemed satisfactorily complete.

# **Schedule and Site Visits:**

*Provide an anticipated schedule for completing tasks in a “weeks from Purchase Order (PO)” format. Each SOW task item must be listed as a separate schedule line item. Deliverables to NYSERDA must be listed as separate schedule line items. For this section, include the language, format, and tables below these instructions and add the following detailed information:*

* *Fill in project specific data when indicated*
* *Complete detailed deliverable schedule Table*

*NYESRDA must be notified as soon as possible if the deliverable dates in the schedule change.*

It is expected that the analysis and tasks required to complete this Fleet Electrification Plan will take ***[# of weeks]*** weeks to complete. This timeframe will begin once the Contract Letter and Purchase Order (PO) is received from NYSERDA.

Below is a detailed deliverable schedule based in weeks after receipt of the PO:

|  |  |  |
| --- | --- | --- |
| ***Task #*** | ***Task*** | ***Schedule****(in weeks from PO)* |
| *1* | *Project Kickoff and Client Meetings* |  |
| *2* | *Data Collection* |  |
| *3* | *Route Analysis & Bus Technology Assessment* |  |
| *4* | *Conceptual Charging Strategy* |  |
| *5* | *Electric Utility Analysis* |  |
| *6* | *Concept Development & Phasing Plan* |  |
| *7* | *Transition Plan Cost Estimates* |  |
| *8* | *Optional: Workforce Training Needs* |  |
| *9* | *Final Report and Presentation* |  |

# **Budget:**

*Provide a detailed budget breakdown using the Budget Template, or equivalent format that includes all the information identified in the Budget Template. Include the following in this section:*

* *Import of budget table (preferred) or budget table as a separate attachment*
* *Each SOW task item must be listed as a separate budget line item*

***If using a sub-consultant:*** *Identify the sub-consultant, which tasks they will be completing, the budget per task, and the total budget allotted to each sub-consultant*

*All consultants must include the following Project Cost Share Information:*

* *Total study cost*
* *Dollar amount contributed by Client*
* *Dollar amount contibuted by NYSERDA*
* *Program through which the cost-sharing will be provided*
	+ *Priority Districts apply through the P-12 Clean Green Schools Initiative (CGSI) program*
	+ *Non-Priority Districts and contractors apply through the FlexTech program*

*The cost-share for Fleet Electrification Plans are as follows:*

* *100% if the Client is a Priority District*
* *75% if the Client is a non-Priority District*
* *50% if the Client is a bus contractor*

***[Insert Budget Table Here]***

***[Insert Sub-Consultant Information if applicable]***

**Project Cost-Share Information:**

The total cost to complete the tasks associated with this SOW is $***[Total Project Cost]***. The Client will contribute $***[Client Cost]*** and NYSERDA will contribute $***[NYSERDA Cost]*** through the ***[Program Name]*** as specified in the NYSERDA Purchase Order and summarized in the table below.