Scope of Work Template – School Bus Fleet Electrification Plan

NYSERDA FlexTechProgram
Scope of Work

NYSERDA Client: **[Insert Client Name]**
Energy Service Provider: **[Insert Energy Provider]**

Instructions

1. Fill in the NYSERDA Client and Energy Service Provider lines above.
2. Use this Scope of Work (SOW) template to complete your Fleet Electrification Plan (FEP) application.
3. This SOW template is considered a minimum requirement. The information you choose to add, plus the format, tasks, and layout of the SOW can be customized as long as the requirements of the template are still met.
4. Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application.
5. For Priority Districts, Non-Priority Districts, and BOCES, submit this SOW, along with the project budget and the application document, through NYSERDA’s FlexTech Program portal.
	1. BOCES’ priority status depends on their depot location; if the BOCES depot is in a DAC the BOCES will receive priority status
	2. BOCES can also receive priority status by providing chargers for visiting buses on their campus. For more information on this scenario, please refer to the “BOCES Charging for Visiting Districts” template located on our [FEP webpage](https://www.nyserda.ny.gov/All-Programs/Electric-School-Buses/Fleet-Electrification-Planning)

**Delete this list of instructions (1-5), and instructions throughout, before submitting the SOW.**

NOTE: NYSED [defines](https://www.p12.nysed.gov/schoolbus/regulations/html/section156.3_safety_regulations.html#:~:text=(2)%20A%20school%20bus%20shall,from%20school%20or%20school%20activities.) a school bus as “every vehicle owned, leased or contracted for by a public school, board of cooperative educational services or a nonpublic school and operated for the transportation of pupils, children of pupils, teachers and other persons acting in a supervisory capacity to or from school or school activities.” This definition includes vans, SUVs, and all other vehicles used for pupil transportation, not solely yellow buses.

Introduction

Instructions

The Introduction should be a brief overview of the parties involved in the Fleet Electrification Plan (FEP), including consultants, any sub-consultants, school district, and others. The information you provide in the Introduction enables NYSERDA to prepare for the incoming project.

NOTE: Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

Application Information

1. **[Describe the reasons for doing this study i.e.: statewide requirements, school district goals, contractor goals, long-term planning desires, costs, etc.]**
2. 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 for **[Applicant School District/BOCES/Bus contractor],** “the Customer.”
3. **[If applicable, mention any sub-consultants that are part of the study, and their role].**

NOTE: Please replace either “the Consultant” or “the Customer” with “the Applicant” depending on who the lead applicant is (i.e. who NYSERDA will be paying).

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

District, Fleet, and Facility Description

Instructions

This section should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

Project Information

1. **[District Description: Describe the School District/BOCES. 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/Disadvantaged community/Priority]**
2. **[Describe the school bus fleet that will be the focus of this Fleet Electrification Plan.]**
[**Include, at a minimum, the following:]**

**[Number of buses]**

**[# of buses owned by the district AND # of buses contracted (even if one of these values is 0)]**

**[General uses of buses (as available)]**

**[Types of buses (Type A, B, C, etc. as available)]**

**[If any buses are already electrified or zero-emission (as available)]**

1. **[Fleet Description: State the number of buses, ownership of the buses, where they are stored (including the address, the type(s) of buses, typical uses), and if any buses are already electric/zero-emission]**
2. **[If the study includes multiple buildings or bus depots, provide a table that lists each site to be analyzed through the study. The information included in the table below should be included for each building, to the extent possible.]**

NOTE: Include number of existing EV chargers on site, if applicable.

1. **[Facility Description: Briefly describe where the buses are domiciled, including the address. If multiple locations, include the number of buses and other vehicles used for pupil transportation stored at each. Descriptions should include at minimum the address of the site, number of vehicles 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/BOCES and for the School/Depot where the buses are stored]**

Tasks and Deliverables

Instructions

 Applications should follow the tasks as laid out in this template. 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. Any alterations must be approved by a NYSERDA Project Manager. 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.

Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

Task 1: Project Kickoff and Client Meetings

Scope:

Kickoff meeting

* **[Indicate whether this will take place in-person (with the site visit) or virtually]**
* **[Ensure NYSERDA and the Utility are invited to this meeting as optional participants]**

Site Survey

* **[The site survey should be conducted in-person. Please indicate if this will be occurring at the same time 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]**

**Deliverables:**
[**List deliverables associated with Task 1.]**

Task 2: Data Collection

Instructions

 Include the following 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, indicate which party will be delivering this task.

Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

**Scope:**

**[Coordinate with District/Utility to collect this information]:**

Bus fleet information – number of buses (current/projected), bus types/size, replacement schedule, ownership (district-owned/contracted)

Bus schedules and routing data

Bus parking/storage arrangements (including ownership of that land or building)

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, current on-site demand

Existing site plan(s)

**[Include other data as needed]**

**Deliverables:**

**[List deliverables associated with Task 2.]**

Task 3: Route Analysis & Bus Technology Assessment

Instructions

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, indicate which party will be delivering this task.

Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

**Scope:**

Required:

 Analyze available route data for time and distance to understand range and energy requirements by route

Include information on sports routes, field trips, and the maximum number of buses on extracurricular trips at any point

Factor in climate, topography, and driving conditions to determine the energy needs of each route. Identify the temperature, battery efficiency, and all other assumptions used in the route energy analysis.

Identify minimum battery requirements for each route

Compare at least 2 different bus manufacturers

Recommend bus types and battery sizes for each route. Identify routes that cannot be met with today’s technology.

Show the feasibility of electrifying each route using the recommended bus type under 2 temperature scenarios (shown as a yes/no condition):

* Cold: Winter ESB battery efficiency (average winter low of the last 5 years)
* Temperate: Fall/Spring ESB battery efficiency (average temperature between March 1-November1)

Include the frequency, or % of days in the year the fall within each temperature scenario

**[Optional]:**

 Include a third “Extreme Cold” temperature scenario (lowest temp of the last 5 years)

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 pumps or fuel-cell heaters)

Include analysis of sports routes and/or other activity routes that the buses would be completing to see if they would be feasible with today’s technology

Additional tasks as discussed with the Client

**Deliverables:**

**[List deliverables associated with Task 3.]**

Task 4: Conceptual Charging Strategy

Instructions

 Include the following 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.

Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

**Scope:**

Create a charging strategy based on the routing requirements, energy needs, and recommended battery sizes in Task 3. The charging strategy shall include the following:

* Charger power rating(s)
* Quantity of chargers (by type if multiple types)
* Analysis on impact of bus type/size on charging strategy
* Propose charging profile for all buses

Identify the potential peak demand reduction possible when using a charge management software (CMS)

Recommend a charging strategy including charger types, quantities, and charging times

Identify and outline a charge management strategy for the district to optimize efficiency and reduce demand charges

Identify routes that are able to complete their afternoon runs without midday charging, and routes that have charge remaining after all of their scheduled runs

Describe the benefits of CMS in long-term operations

Submit the necessary inputs for a rate analysis to the utility provider, or use their online tool to complete a rate analysis (as available)

**Deliverables:**

**[List deliverables associated with Task 4.]**

Task 5: Electric Utility Analysis

Instructions

 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.

Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

**Scope:**
Required:

Conduct initial outreach with school district’s utility provider

Summarize the findings of the utility rate analysis (as available)

If the district is planning an imminent capital project (with design work within the next 6 months) submit a work request for the full fleet energy needs required in 2035

Request a capacity analysis from the district’s utility provider

Hold a meeting with the Utility, School District, NYSERDA, and Consultant to discuss expected peak loads

Update or create the f[leet 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) with the utility provider on behalf of district based on Task 3 and 4 results

Work with the utility to determine the overall equipment needs and costs, as well as the breakdown of costs (utility side vs customer side)

Discuss possible mitigation measures if power cannot be supplied to the site, and possible obstacles for the district meeting the timelines required by New York State law (ie. Alternative connection options, battery storage, mobile chargers, easements, component lead times, etc.)

Description of how multiple sites will be handled, if applicable

**[Optional]:**

 Vehicle-to-Grid Charging Analysis

Backup Power Analysis

Microgrid Analysis

**Deliverables:**

**[List the deliverables associated with Task 5.]**

Task 6: Concept Development & Phasing Plan

Instructions

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.

Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

**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

Provide a consolidated timeline for how the school district could meet the 2035 transition schedule either in phases, or year-by-year

**Deliverables:**

**[List the deliverables associated with Task 6**.]

Task 7: Transition Plan Cost Estimates

Instructions

 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.

Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

**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 total cost of ownership (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 purchasing diesel/gas vehicles)

Identify and estimate the cost reduction potential of possible incentives

Incorporate the rate analysis conducted by the Utility (as available)

Include potential/estimated cost of Charge Management Software

**[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 TCO analysis including maintenance, fuel, workforce training, etc.

**Deliverables:**

**[List the deliverables associated with Task 7.]**

Task 8: Final Report and Presentation

Instructions

 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.

Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

Scope**:**

Prepare a Final Report, based on the NYSERDA Final Report Guidelines and Checklist, 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.

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.

Optional: presentation to the school board

**Deliverables:**

Draft and Final Report

Final Presentation

Assumptions [Optional]

Instructions

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.

Text that is bolded and in brackets **[like this]** should be populated with the information relevant to your application. Delete instructions before submitting your SOW.

**[Insert examples of assumptions, which could include, but are not limited to:]**

 Fleet information will be provided by the Client, including current number of buses, age of buses, types of bus (number of seats and GVWR), number of bus routes, 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, 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 party service providers will be shared with the consultant.

Example text for the assumptions section:

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:

**Required**: The applicant shall address technical review comments from NYSERDA until the draft report is deemed satisfactorily complete.

Schedule and Site Visits

Instructions

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

NYSERDA 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]** to complete. This timeframe will begin once the Contract Letter and Purchase Order (PO)
is received from NYSERDA.

This table has a detailed deliverable schedule based in weeks after receipt of the PO. Please adjust as needed.

|  |  |  |
| --- | --- | --- |
| 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

Instructions

Provide an itemized 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 contributed by NYSERDA

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

If the client is a bus contractor:

* 50% if only some of the vehicles housed at the location are being studied
* 75% if all of the vehicles housed at the location are being studied
* 100% if all of the vehicles housed at the location are being studied and the depot serves a Priority District OR if the depot is located in a DAC.

**[Insert Budget Table.]**

**[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]** as specified in the NYSERDA Purchase Order and summarized in the table below.