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ESB Small Producers Energy Efficiency Deployment (SPEED) Pump Jack Electrification Checklist

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EMISSIONS REDUCTION ALBERTA

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INTRODUCTION

This document is intended as a guide to support the submission of accurate and complete pump jack electrification project applications. All applicants with pump jack electrification projects should ensure the application meets the SPEED Eligibility Requirements set out in the Participant Terms and Conditions, Contractor Code of Conduct and Eligible Measures List. The applicant must submit the requested documentation and answer the questions contained within this document.

This checklist includes guidance for what needs to be entered in each input field at Step 4 and Step 5 of the Application process. Step 5 specifically describes which documents need to be uploaded and their purpose.

GUIDANCE ON APPLICATIONS

The following sections provide guidance on pump jack electrification applications, ensuring that they are complete, accurate and comprehensive.

The applicant and/or contractor will also need to provide the following information in Step 4 and Step 5 of the application submission, as further described in the tables below.

STEP 4 OF PRE-PROJECT APPLICATION: PUMP JACK ELECTRIFICATION

- Conversion of natural gas carbureted engines to electric drive
    - Old gas engine that drives pump jack must be removed from operation
- Pump off controller for electrically driven pump jacks

Please note the other eligibility criteria in the SPEED Eligible Measure List.

Application Tip: *Please ensure the documentation provided in Step 5 supports the information in the application fields below. Please note that at the pre-project stage, on-site measurements are not required. Instead, simulation data or estimates based on other sources (historical data, published studies, specification sheets etc.) can be used.*

Conversion of Natural Gas Carbureted Engines to Electric Drive

The estimated values for the hours of operation and the load of the engine should be based on a typical year of production. This assumption should be used consistently between the pre-project and post-project scenarios.

Field	What to Enter	How Data or Input Provided is Used
Quantity	Enter the number of pump jack units being upgraded (number of engines converted). If there are multiple pump jack engine conversions or controllers installed, please ensure the application data for them is the same. Otherwise, please enter them separately.	• Calculate eligible incentive. • Project review and QA/QC.
Old Engine Manufacturer	Enter the name of the old engine manufacturer.	• Project review and QA/QC.
Old Engine Model Number	Enter the old engine model number.	• Project review and QA/QC.
Old Engine Serial Number	Enter the old engine serial number.	• Project review and QA/QC.
Old Engine Age (Years)	Enter the age of the old engine in years.	• Project review and QA/QC.
Old Engine Size (hp)	Enter the size of the old engine in hp. This is the maximum output of the engine.	• Project review and QA/QC.
Old Engine Estimated Average Engine Load Factor (%)	Enter the estimated average load factor of the old engine as a percentage.	• Project review and QA/QC.

Old Estimated Engine Annual Operating Hours (hours)	Enter the estimated engine annual operating hours of the old engine.	• Project review and QA/QC.
Old Engine Estimated BSFC, LHV - Prior to Project (BTU/bhp-hr)	Enter the estimated BSFC based on LHV in BTU/bhp-hr prior to project.	• Project review and QA/QC.
Old Engine Fuel Consumption - Prior to Project (m_3/year)	Enter the estimated engine fuel consumption in m_3/year prior to project,	• Project review and QA/QC.
Old Engine Estimated NOx Emissions - Prior to Project (tonnes/year)	Enter the estimated NOx emissions in tonnes/year prior to project. If this value is unknown, please list 0.	• Project review and QA/QC.
Old Engine Estimated CO Emissions - Prior to Project (tonnes/year)	Enter the estimated CO emissions in tonnes/year prior to project. If this value is unknown, please list 0.	• Project review and QA/QC.
Old Engine Estimated CH_4 Emissions - Prior to Project (tonnes/year)	Enter the estimated CH_4 emissions in tonnes/year prior to project. If this value is unknown, please list 0.	• Project review and QA/QC.
Old Engine Estimated CO_2 Emissions - Prior to Project (tonnes/year)	Enter the estimated CO_2 emissions in tonnes/year prior to project. If this value is unknown, please list 0.	• Project review and QA/QC.
Old Engine Estimated CO_2e Emissions - Prior to Project (tonnes/year)	Enter the estimated CO_2 equivalent emissions in tonnes/year prior to project.	• Project review and QA/QC.
Motor Size (hp)	Enter the size of the motor for the electric drive in hp.	• Project review and QA/QC.
Estimated Annual Hours of Operation (hours)	Enter the estimated annual hours of operation of the electric drive.	• Project review and QA/QC.
Estimated Average Motor Load Factor (%)	Enter the estimated average motor load factor as a percentage.	• Project review and QA/QC.
Motor Efficiency (%)	Enter the motor efficiency as a percentage based on the size and load factor.	• Project review and QA/QC.
Speed of Motor (RPM)	Enter the motor speed in rpm.	• Project review and QA/QC.
Motor Specification Sheet	Upload the motor specification sheet.	• Project review and QA/QC.
Estimated Annual Electricity Consumption of Motor (kWh)	Enter the estimated annual electricity consumption of motor in kWh.	• Project review and QA/QC.

Estimated Pump Efficiency (%)	Enter the estimated pump efficiency. This should be the design value.	• Project review and QA/QC.
Estimated Volumetric Efficiency (%)	Enter the estimated volumetric efficiency. If this is unknown, please list 25 to show 25%	• Project review and QA/QC.
Run Constant	Enter the estimated run constant. If this is unknown, please list 0.	• Project review and QA/QC.
Run Coefficient	Enter the estimated run coefficient, please list 0.	• Project review and QA/QC.
Estimated Lifespan for Project (Years)	Enter the estimated lifespan that the project will last for. This should include any consideration where the technology becomes obsolete/must be replaced due to changes in emissions requirements, equipment failure or other issues.	• Project review and QA/QC.
Equipment & Material Costs	Enter equipment and material costs as indicated on the invoice / final quote.	• Calculate eligible incentive. • Project review and QA/QC.
Labour Cost	Enter labour costs as indicated on the invoice / final quote.	• Calculate eligible incentive. • Project review and QA/QC.
Design Cost	Enter design costs and include all other costs as indicated on the invoice / final quote. This should include any costs for on-site visits that are required in the post-project application.	• Calculate eligible incentive. • Project review and QA/QC.

Pump Off Controller for Electrically Driven Pump Jacks

Field	What to Enter	How Data or Input Provided is Used
Quantity	Enter the number of pump off controllers being installed. If multiple pump jack electrification projects are installed, please ensure the application data for them is the same. Otherwise, please enter them separately.	• Calculate eligible incentive. • Project review and QA/QC.
Motor Size (hp)	Enter the size of the motor for the electric drive in hp.	• Project review and QA/QC.

Estimated Annual Hours of Operation (hours)	Enter the estimated annual hours of operation of the electric drive.	• Project review and QA/QC.
Estimated Average Motor Load Factor (%)	Enter the estimated average motor load factor as a percentage.	• Project review and QA/QC.
Motor Efficiency (%)	Enter the motor efficiency as a percentage based on the size and load factor.	• Project review and QA/QC.
Speed of Motor (RPM)	Enter the motor speed in rpm. This should be the estimated average speed of the motor.	• Project review and QA/QC.
Estimated Annual Electricity Consumption of Motor (kWh)	Enter the estimated annual electricity consumption of motor in kWh.	• Project review and QA/QC.
Estimated Pump Efficiency (%)	Enter the estimated pump efficiency.	• Project review and QA/QC.
Estimated Volumetric Efficiency (%)	Enter the estimated volumetric efficiency.	• Project review and QA/QC.
Run Constant	Enter the estimated run constant. If this is unknown, please list 0.	• Project review and QA/QC.
Run Coefficient	Enter the estimated run coefficient, please list 0.	• Project review and QA/QC.
Pump Off Controller Specification Sheet	Upload the pump off controller specification sheet.	• Project review and QA/QC.
Time Clock % ON (%)	Enter the estimated percentage the time clock is on for the controller as a percentage.	• Project review and QA/QC.
Estimated Annual Electricity Consumption with Pump Off Controller (kWh)	Enter the estimated electricity consumption of the motor with the pump off controller installed in kWh.	• Project review and QA/QC
Estimated Lifespan for Project (Years)	Enter the estimated lifespan that the project will last for. This should include any consideration where the technology becomes obsolete/must be replaced due to changes in emissions requirements, equipment failure or other issues.	• Project review and QA/QC.
Equipment & Material Costs	Enter equipment and material costs as indicated on the invoice / final quote.	• Calculate eligible incentive. • Project review and QA/QC.
Labour Cost	Enter labour costs as indicated on the invoice / final quote.	• Calculate eligible incentive. • Project review and QA/QC.

Design Cost	Enter design costs and include all other costs as indicated on the invoice / final quote. This should include any costs for on-site visits that are required in the post-project application.	• Calculate eligible incentive. • Project review and QA/QC.

STEP 5 OF PRE-PROJECT APPLICATION: PUMP JACK ELECTRIFICATION

Field	What to Enter	How Data or Input Provided is Used
Cost Quote	Quote or invoice should be itemized to include quantity, brand, model numbers for equipment, applicant name, contractor name, facility address and date (Sample quote provided in the Appendix). Costs should be indicated separately for: • Equipment and Material • Labour • Design and Others • Taxes	• Cross-reference against provided costs. • Calculate eligible incentive. • Project review and QA/QC.
Workplan	Please upload the completed Workplan template.	• Project review and QA/QC.
Pre-Project Photo	Please upload a photo of the equipment before the installation of the project.	• Project review and QA/QC.
Simulation of Performance/Estimate of Energy Savings and Emissions Reduction	Please upload documents from simulation software or other sources of information that supports the estimate of energy savings and emissions reduction in the application. This can be data from software simulations or estimates based on other sources (historical data, published studies, specification sheets etc.). Where applicable, please state assumptions made and/or provide sample calculations if estimates were based on engineering calculations. Please note that the more reliable the information provided is, the greater certainty the review will have for the estimated emissions reduction.	• Project review and QA/QC.
Other Documentation	Please upload any other documentation that you think will be helpful for the review.	• Project review and QA/QC.

POST-PROJECT APPLICATION: PUMP JACK ELECTRIFICATION

Note that for the post-project application, you will be required to confirm that no changes were made from the pre-project application, unless an Application Change Approval Notice was issued by ERA. You will need to confirm Actual Costs for the project.

In terms of additional documents required, you will need to provide evidence of the following:

- Invoice for Project Costs
- Proof of Payment for Project Costs
- Post-Project Photo
- On-Site Measurement Data
- Conditions stated in the Notice of Pre-Approval

Please upload any other documentation that you think will be helpful for the review. There may be additional documentation that we request during the review process. Please note that if the on-site measurement data changes the estimated performance of the project for energy savings and emissions reduction substantially, the incentive reservation may be updated to reflect the on-site measurement data.

Participants may be subject to a QA/QC check and may be asked for additional documentation or to facilitate a site visit.

APPENDIX

SAMPLE INVOICE/FINAL QUOTE

Quotes should be itemized to include quantity, brand, model numbers for equipment, applicant name, contractor name, facility address and date. Costs should be indicated separately for:

- Equipment and Material
- Labour
- Design and Others
- Taxes

A sample quote is provided below:

Company Logo

Company Address:	xxxx
Website:	xxxx
Phone:	xxxx

	PROJECT NAME: XXXX	**Project Start Date:**	xxxx
		Project Completion Date:	xxxx
Applicant Company:	xxxx		
Applicant Name:	xxxx	**Quote #:**	xxxx
Facility Address:	xxxx	**Date:**	xxxx
Phone:	xxxx		

Measure #1			
Fixture Description	LITHONIA CPANL 2X4 40/50/60LM 40K M2	**DLC**	PMS5PPS6
Measure Description	LED 2x4 Recessed Light Fixture - 4,500 – 5,999 Lumen Output	**QTY**	63
Measure Equipment/Material Costs			$ 6,538.71
Measure Labour Costs			$ 13,251.74
Measure Design/Other Costs			$ -
		Measure Total Costs	$ 19,790.45

Measure #2			
Motor Description	ILA7080-H Siemens Semiotics 10 hp		
Measure Description	Premium efficient motor –ODP-10 hp	**QTY**	1
Measure Equipment/Material Costs			$ 934.10
Measure Labour Costs			$ 123.11
Measure Design/Other Costs			$ 50.00
		Measure Total Costs	$ 1,107.21

Measure #3			
Sensor Description	Occupancy Sensor		
Measure Description	Fixture Mounted Sensor	**QTY**	305
Measure Equipment/Material Costs			$ 15,250.00
Measure Labour Costs			$ -
Measure Design/Other Costs			$ -
		Measure Total Costs	$ 15,250.00

Total		
Total Equipment/Material Costs		$ 22,722.81
Total Labour Costs		$ 13,374.85
Total Design/Other Costs		$ 50.00
	Total Project Cost	$ 36,147.66
	GST	$ 1,807.38
	Total Cost w/ GST	$ 37,955.04