Appendix H

Greenhouse Gas (GHG) Analysis

Appendix H
GHG Worksheet

Snowshoe BESS, LLC Olmsted County, MN 7/10/2024	**From SPA- Section 5.2.7.1 Transportation Section 4.3.4 Operations and Maintenance**	Snowshoe Energy Storage Project estimates that there will be between five and ten semi-trucks used daily for equipment delivery during construction. This volume of traffic will only occur for several weeks during the delivery of the battery enclosures and the transfomer skids; truck traffic will decrease once these components are delivered. Light duty trucks will also be used daily for transportation of construction workers to and from the site.
	From SPA - Section 4.3.1 Construction and Construction Mgmt	Typical onsite construction staff levels will depend on the number of concurrent tasks being performed and the phasing of the Project. The Project will create approximately fifty jobs during the peak construction and installation phases, and up to two full-time positions during the operations phase.
		After construction is complete, traffic impacts during the operational phase of the Project are expected to be negligible. A small maintenance crew driving to the site in light duty trucks on a regular basis will monitor and maintain the facilities as needed; traffic levels in the community adjacent to the Project Area will not be impacted as a result

Equipment Fuel Consumption Estimate

Phase	Equipment Type	No. of Equipment	Days	Duration (hours/day)	Fuel Consumption (gal/hour)	Fuel Type	Est. Total Gallons	Notes/Assumptions
Construction	Bulldozer	2	30	8	7.6	Diesel	3,648	Caterpillar D6T Medium Load
Construction	Grader/scraper	1	30	8	5.6	Diesel	1,344	Caterpillar 140M3 Medium Load
Construction	Backhoe	1	30	8	3.1	Diesel	744	Caterpillar 420F Low Load
Construction	Roller	1	20	8	6.6	Diesel	1,056	CAT 84" (2), CAT CS56B, CAT CB24
Construction	Excavator	1	20	8	8.1	Diesel	1,296	Caterpillar 336D Medium Load
Construction	Wheel Loader	1	30	8	4	Diesel	960	CAT 950M
Construction	Skid steer	1	120	8	3.3	Diesel	3,168	Caterpillar 289D Medium Load
Construction	Fork lift (all terrain)	2	120	8	2.9	Diesel	5,568	JLG 12K (3), JCB 512-56 (2), JCB 12K VR (6), CAT 12K VR
Construction	Tractors	1	20	8	7	Diesel	1,120	Ford 4600 AG & International 9200I
Construction	Track Manlift	1	20	8	2.6	Diesel	416	GENIE S-60 TraX MANLIFT
Construction	Track Boom	1	30	8	2.6	Diesel	624	GENIE S-65 TraX BOOM
Construction	Track Loader	1	30	8	5.33	Diesel	1,279	CAT 963K TRACK LOADER W/ FORKS & BKT
Construction	Wheel Loader	1	30	8	4.4	Diesel	1,056	CAT 950K WHEEL LOADER W/BKT & FORKS
Construction	Dump Truck	2	20	8	10	Diesel	3,200	Tandem Axle 10-14 CY
Construction	Concrete truck and boom	2	20	8	12	Diesel	3,840	Primarily Foundations, also substation
Construction	Semi truck/trailer	1	30	8	10	Diesel	2,400	Standard size and weight semitruck for equipment deliveries
Construction	Light Duty Crane	1	20	8	12.6	Diesel	2,016	LINK-BELT LS-238 HSL CRAWLER CRANE
Construction	Medium Duty Crane	1	20	8	12.6	Diesel	2,016	LINK-BELT LS 248 200 TON CRAWLER CRANE
Construction	Watering truck	1	120	8	4.3	Diesel	4,128	BAS VOLVO FMX WATER TANK TRUCK
Construction	Truck Mounted Auger or Drill Rig	1	20	8	5.33	Diesel	853	
Construction	Pile Driver	1	30	8	5.33	Diesel	1,279	Could also be driver for helical piles
Construction	Generator	1	120	8	1	Gasoline	960	CAT XQ30KW
Construction	Light-duty pickup truck (on-site)	4	130	6	3.6	Gasoline	11,232	
Construction	Construction contractor and worker vehicles (commute to/from site)	50	130	1.3	2.5	Gasoline	21,667	Assume bulk of the workforce lives in Rochester, MN and drive to the site. Workers in Rochester are about 40 minutes one way, 80 min round trip. Assume 50% carpool.
	TOTAL GALLONS GAS (per year)						**33,859**	
	TOTAL GALLONS DIESEL (per year)						**39,879**	

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Phase	Equipment Type	No. of Equipment	Days/Year	Duration (hours/day)	Fuel Consumption (gal/hour)	Fuel Type	Est. Total Gallons	Notes/Assumptions
Operation	Light-duty pickup truck (commute to/from site) - 1 full time staff	1	60	2	2.5	Gasoline	300	1 BESS Tech (Only on-site for troubleshooting)
Operation	O&M contractor vehicles (commute to/from site)	1	50	1.0	2.5	Gasoline	125	1 Off site Manager visiting site once per week
Operation	O&M contractor vehicles (on-site)	1	60	1	2.5	Gasoline	150	1 Service Tech at 1.25 days average per service
	TOTAL GALLONS GAS (per year)						**575**	
	TOTAL GALLONS DIESEL (per year)						**-**	

Summary						
Construction	**Annual Gallons**	**KG of CO2 per Gallon Diesel**	**KG of CO2 per Gallon Gas**	**Total KG**	**KG to Tons Conversion Factor**	**Total Tons**
Total Gas	33,859		8.78	297,279	0.00110231	327.7
Total Diesel	39,879	10.19		406,369	0.00110231	447.9
				703,648		**775.6**
Operation						
Total Gas	575		8.78	5,049	0.00110231	5.6
Total Diesel	-	10.19		0	0.00110231	0.0
						5.6

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Construction		**KG of CO2 per Gallon Diesel**	**KG of CO2 per Gallon Gas**	**Total KG**		
Total Diesel	39,879	10.19		406,369		https://www.eia.gov/environment/emissions/co2_vol_mass.php
Total Gas	33,859		8.78	297,279		https://www.eia.gov/environment/emissions/co2_vol_mass.php
			Total - KG	**703,648**	0.00110231	Conversion Factor KG to Tons
			Total - Tons	**776**		

Annual Operation		**KG of CO2 per Gallon Diesel**	**KG of CO2 per Gallon Gas**	**Total KG**		
Total Diesel	0	10.19		0		https://www.eia.gov/environment/emissions/co2_vol_mass.php
Total Gas	575		8.78	5,049		https://www.eia.gov/environment/emissions/co2_vol_mass.php
			Total - KG	**5,049**	0.00110231	Conversion Factor KG to Tons
			Total - Tons	**6**		