Motor System Stock Assessment: Webinar 1

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Agenda

- Background

- Timeline

- Sample Design

- Data Elements

- Ways to Engage

- Q&A

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Background

2027 Motor Systems Stock Assessment (MSSA)

This study will collect motor characteristic data on stand-alone motor-driven equipment in a representative sample of industrial facilities. This data has not been collected in the region since 2000.

MSSA Work Group

Purpose: The Motor System Stock Assessment (MSSA) Work Group will provide NEEA with decision support and coordination on key components of the study's design and implementation.

- Bonneville Power Administration

- Clark PUD

- Idaho Power

- Northwest Power and Conservation Council

- Puget Sound Energy

- Seattle City Light

The MSSA Team

Westat

- Sample Design

- Survey Instrument

- Analysis

- Reporting

Cadmus, Cascade, and SBW

- Recruitment

- Data Collection

Timeline

Introductions

Westat

- Cindy Good

- Michelle Ruddick

- Frost Hubbard

Cadmus, Cascade, and SBW

- Phillip Maddi

MSSA Project Timeline

Milestone/Task	2025		2026				2027		
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
	J A S	O N D	J F M	A M J	J A S	O N D	J F M	A M J	J A S
Utility Communications Plan		▓▓	▓▓●						
Notify Utilities			●						
Sample Design and Weighting Planning	▓	▓▓	▓▓						
Sample Selection			●						
Site Visit Instrument Development			▓▓	●					
Recruitment Planning			▓	▓					
Recruitment				●	▓▓	▓▓			
Data Collection Planning				▓▓					
Field Data Collection				●	▓▓	▓▓	▓		
Data Quality Control, Preparation, Weighting, Analysis				▓	▓▓	▓▓	▓▓	▓	
Data and Reports Published on neea.org								▓●	

Sample Design

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Overview

- Requirements and Objectives
- Design Highlights
- Establishment Definition
- Sampling Frame
- Stratification and Oversampling
- Substitution
- Eligibility and Response Rates
- Survey Weights

Requirements and Objectives

- 160+ establishment site visits

- Four industries (40+ site visits per industry; NAICS code in parens)

  - Water Supply (22131) and Wastewater Treatment (22132)

  - Food Production (311)

  - Wood Production (321)

  - Computer and Electronics Production (334)

- Desired precision: margin of error of 10-20% with 90% confidence for proportions and totals

- Key estimate for design: Total motors

Design Highlights

- Stratified, single stage, random sample of establishments

- Stratification variables: NAICS code, establishment size

- Substitution for nonresponding establishments

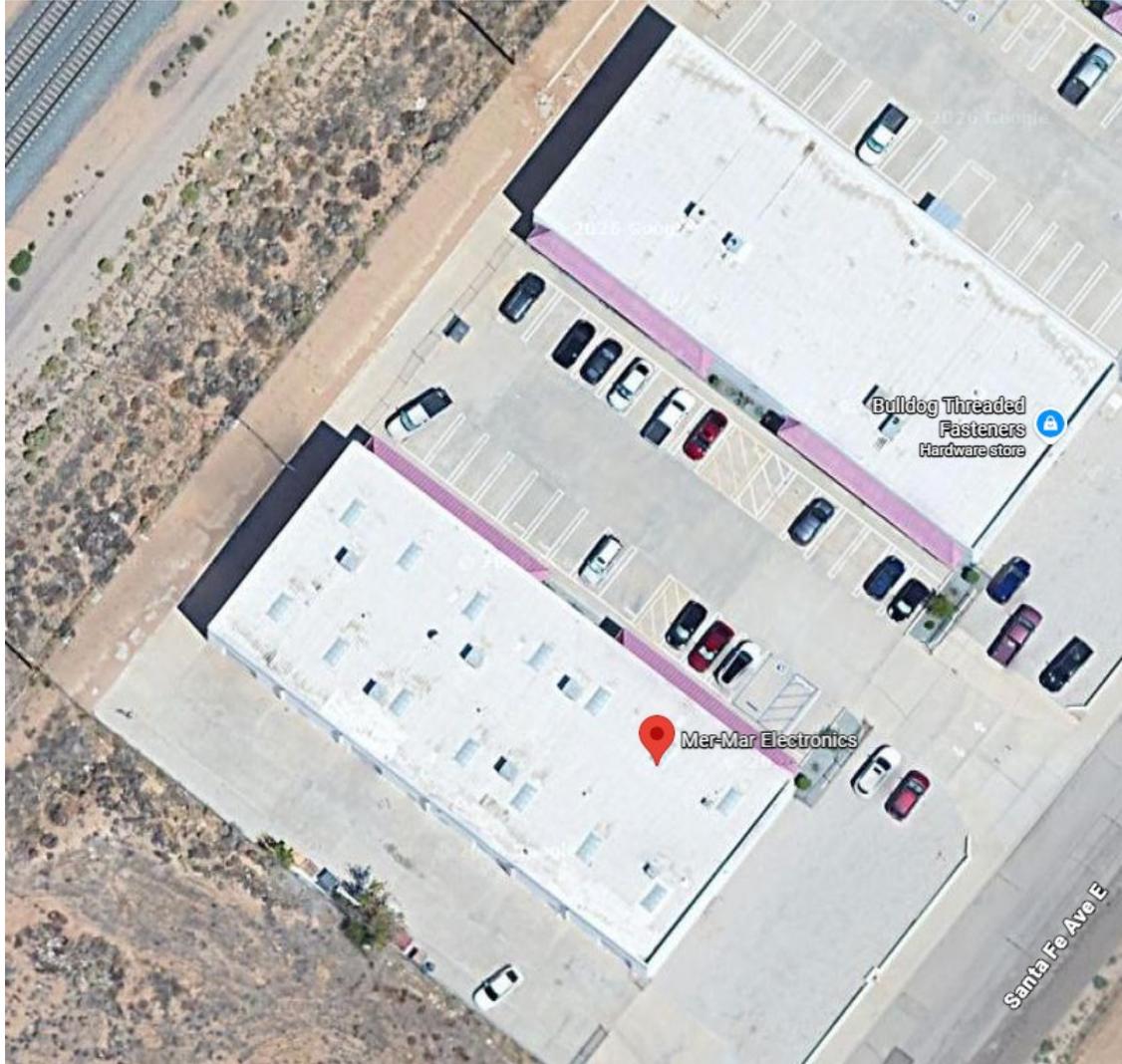- Subsampling w/in establishments
  - Buildings, motors

Establishment Definition

- An economic unit at a single physical location where industrial operations are performed, generally in facilities described as plants, factories, or mills. An establishment may be a stand-alone business, firm, or enterprise at <u>one</u> location; or a business, firm, or enterprise may have establishments in multiple locations.

- Establishment to building scenarios:

  - One establishment in one building (1-to-1)

  - Many establishments in one building (many-to-1)

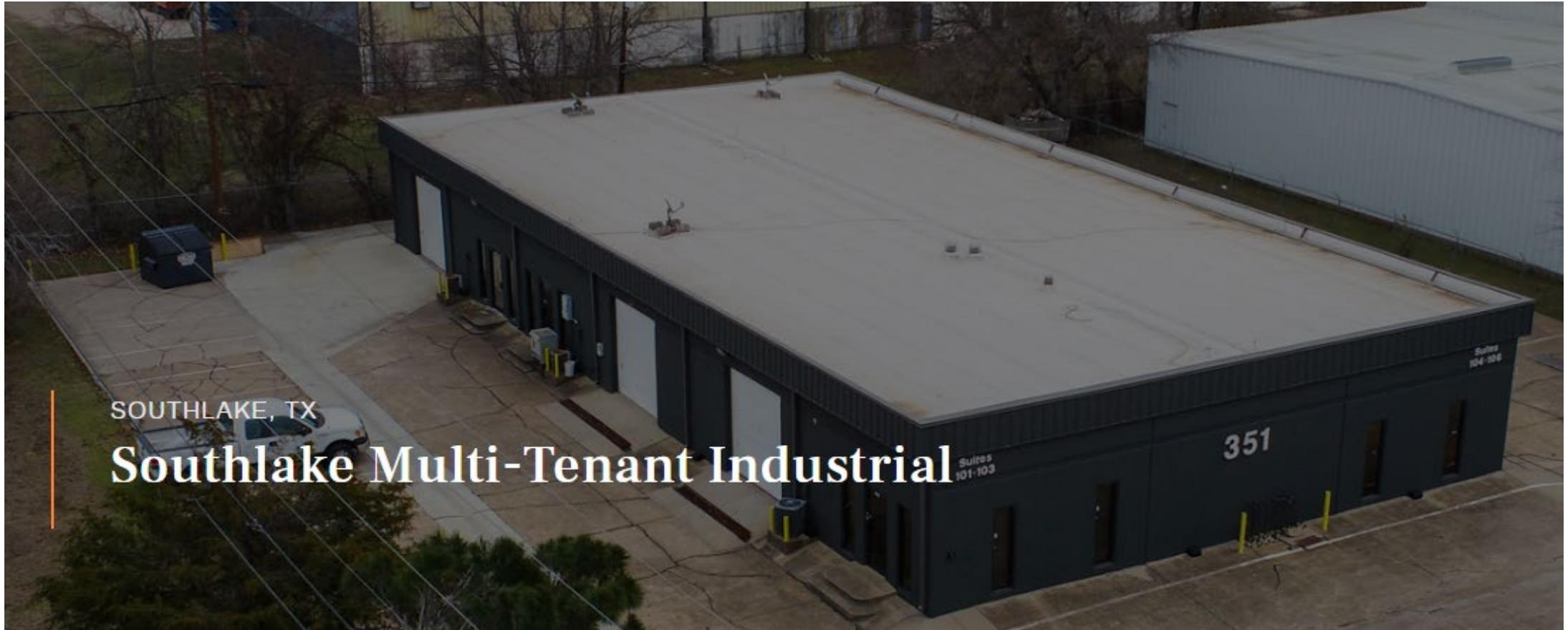 - One establishment with many buildings in one location (1-to-many)

One Establishment - One Building

Many Establishments - One Building

SOUTHLAKE, TX

Southlake Multi-Tenant Industrial

Suites 101-103

Suites 104-106

351

One Establishment - Many Buildings

Creating a Sampling Frame

- **Goal:** Create a list of establishments for each NAICS code within MSSA geographic area.

- Multiple data sources

  - 2 vendor-purchased sources

    - Dun and Bradstreet (D&B), Manufacturers' News Inc (MNI)

  - 7 NAICS-specific public-use sources

    - 4 for Water Supply, 1 for Wastewater Treatment, 2 for Wood Production

  - Cadmus and Cascade contacts

Sampling Frame: Key Variables

- ## Stratification variables
  - NAICS code

  - Establishment size variables
    - Square footage, number of employees, population served (water), design capacity (water)

- ## Recruitment variables
  - Establishment name and address

  - Contact information

Stratification and Oversampling

- Five size-based strata w/in each NAICS code
  - Water Supply and Wastewater:
    - Population served, design capacity
  - Other 3 NAICS: establishment square footage

- Select establishments with equal probability w/in strata

- Unequal selection probabilities across strata
  - Larger establishments get higher chances of selection

Substitution

- Useful in specific scenario

  - Small populations, small sample sizes, and highly skewed distribution

- Substitute will be of same NAICS code and similar in size to original nonresponding establishment

Projected Eligibility and Response Rates

	Industry type				Total
	Water Supply and Wastewater	Wood Products	Food Manufacturing	Computer and Electronic Manufacturing	
Sampled establishments	53	72	75	75	275
Eligibility rate	0.90	0.70	0.75	0.75	0.77
Eligible establishments	47	50	56	56	210
Response rate after all substitutions	0.95	0.90	0.80	0.80	0.86
Completed site visits	45	45	45	45	180

Survey Weights and Stratum Indicator:
Allowing Analysts to Make Appropriate Inferences to Target Population

- Weights will account for oversampling and help reduce the potential for nonresponse bias in estimates.

- Stratum indicator on final file to allow analysts to account for stratification when estimating variance.

- User Guide will provide example code for weighted analyses and variance estimation in Python and R.

Data Elements

What will be in the data?

Systems

- Blowers/Fans
- Pumps
- Vacuum Pumps
- Air Compressors
- Refrigerator Compressors
- Material Processing/Handling

Motor Inventory

- Horsepower
- Control
- Use
- Load Factor

Ways to Engage

Ways To Engage

1. Webinars

2. List serve: neea.org/subscribe

3. neea.org/motor-system-stock-assessment

Motor System Stock Assessment

The 2027 Motor Systems Stock Assessment will provide the Northwest's first comprehensive dataset on industrial motor energy characteristics to help identify opportunities for efficiency and reduced electricity consumption.

Thank You!

Questions? Reach out to -

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