
Energy Efficiency in the Flower Sector, Kenya

A Business Perspective

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February, 2021

Presentation Outline

- ✓ Introduction
- ✓ Typical Flower Farm
- ✓ Study Findings
- ✓ Technology Sizes

INTRODUCTION

Introduction: Flower Sector in Kenya

- ✓ The flower sector is under Kenya Flower Council which **advocates** and **promotes** the interests of the **floriculture Sector** in Kenya.
- ✓ There are **fifteen regions** in Kenya that grows flowers namely; **Nakuru, Meru, Kajiado, Nairobi, Trans Nzoia, Uasin Gishu, Laikipia, Kiambu, Nyeri, Murang'a, Machakos, Nyandarua, Kericho, Kirinyaga,** and **Embu.**
- ✓ Flower farms in the country span from **breeders, cuttings, propagators** and **cut flower** subsectors.
- ✓ The flower industry in Kenya employs over **150,000 people directly, 1 Million people indirectly** and impacts over **4 million livelihoods.**

Introduction: Study Scope

- ✓ The study was conducted on 37 flower farms.
- ✓ Six thematic areas were drawn; informed technologies, linkages within and out of the sector, and investment feasibility

- ✓ Thematic areas:

1. General energy management measures
2. Power supply measures
3. Lighting measures

4. Refrigeration measures
5. Motors, and pumps measures
6. Adoption of renewable energy

Introduction: Study Scope Cont'd

1

General energy management measures

- Training and awareness
- Operation and maintenance
- Data capture, analysis and monitoring performance
- Upgrade of facility equipment/operating procedures

2

Power supply measures

- Tariff migration
- Power factor improvement
- Monitoring of energy consumption

3

Lighting measures

- Retrofit of existing lighting fixtures
- Replacement of obsolete fixtures
- Installation of timers and motion sensors

4

Refrigeration measures

- Retrofit of existing refrigeration units
- Upgrade of obsolete refrigeration units
- Repair and maintenance
- Automation

Introduction: Study Scope Cont'd

5

Motors, and pumps measures

- Retrofit of pump, motor's and controls systems
- Upgrade of obsolete pumping systems
- Optimisation through adoption of Variable Speed Drive and soft starters

6

Adoption of renewable energy

- Installation of solar PV, pumping and thermal
- Maintenance of solar PV

TYPICAL FLOWER FARM

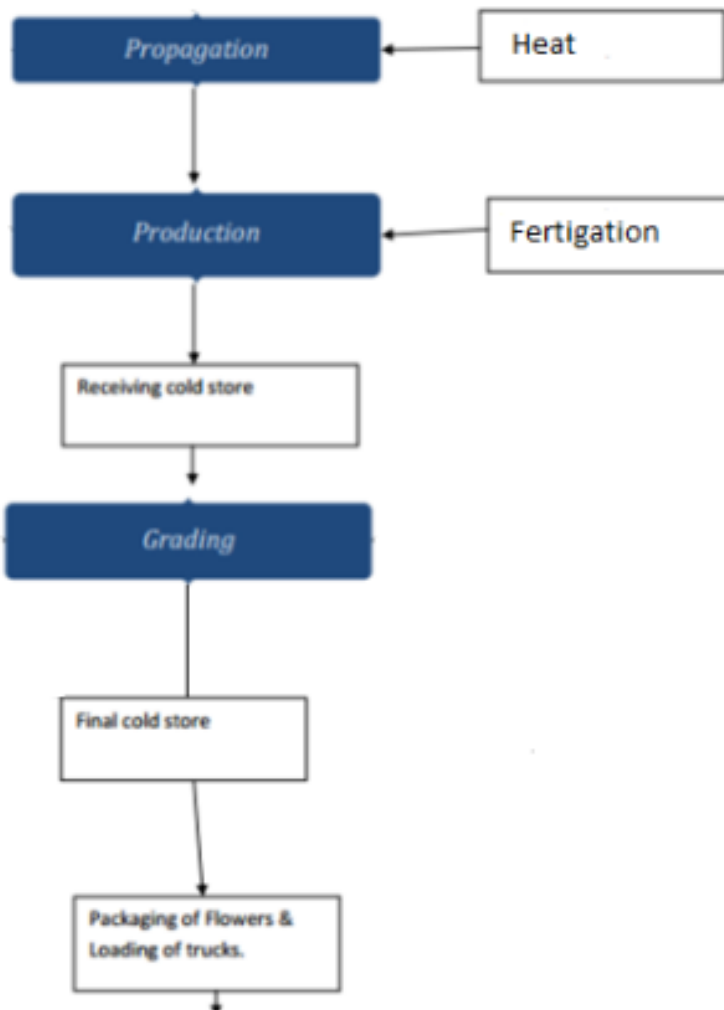
Typical Flower Farm: Energy Usage

Sources of Energy

1

1. Electricity,
2. Diesel,
3. LPG,
4. Wood fuel

2



Usage distribution

3

Usage was split between four main areas: farm, pumps, cold rooms, lighting.

- ✓ Farm range: 3.7 – 80%
- ✓ Pumps range: 20 – 71%
- ✓ Cold rooms range: 11.3 – 34%
- ✓ Lighting range: 7 – 53%

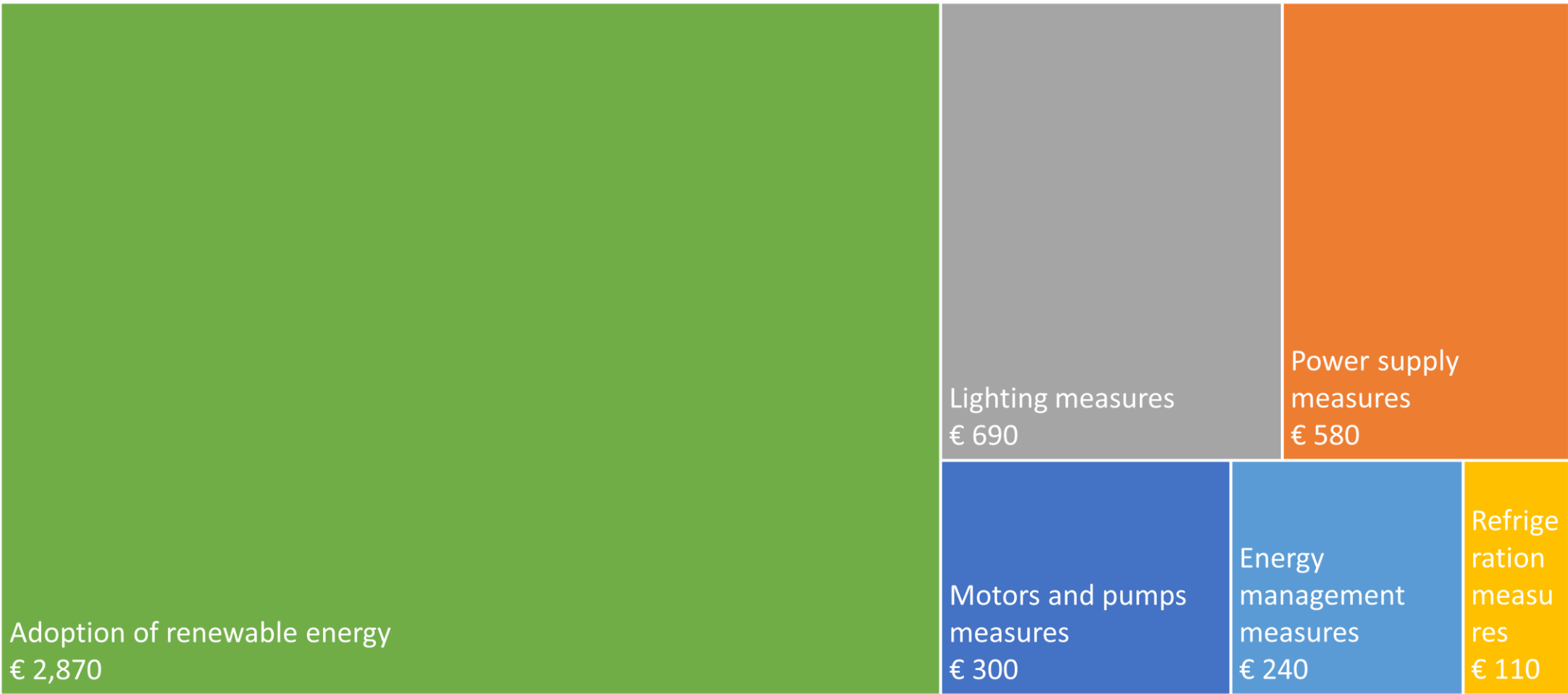
STUDY FINDINGS

Study Findings: Summary of 37 Farms

#	Recommendation	Total Energy Savings/ Generated (MWh/a)	Total Cost Savings (1.000 EUR/a)	Total Investment Cost (1.000 EUR)	Average Payback Period (Months)
1	Energy management measures	1.640	260	240	11
2	Power supply measures	1.350	350	580	20
3	Lighting measures	1.950	320	690	26
4	Refrigeration measures	530	80	110	16
5	Motors and pumps measures	1.820	190	300	19
6	Adoption of renewable energy	4.600	820	2.870	42
TOTAL		7.290	2.020	4.790	28

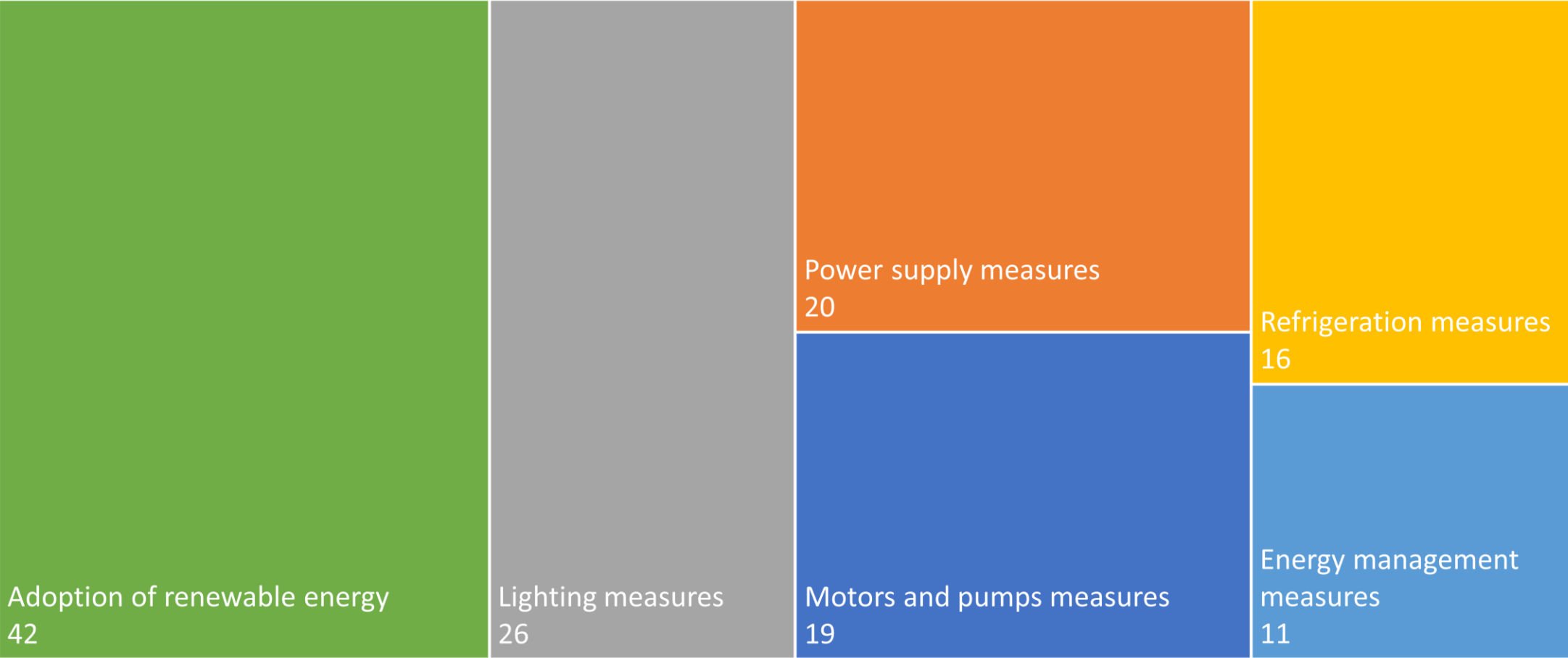
Study Findings: Investment Cost

Total Investment Cost Distribution (Thousand EUR)



Study Findings: Payback Period

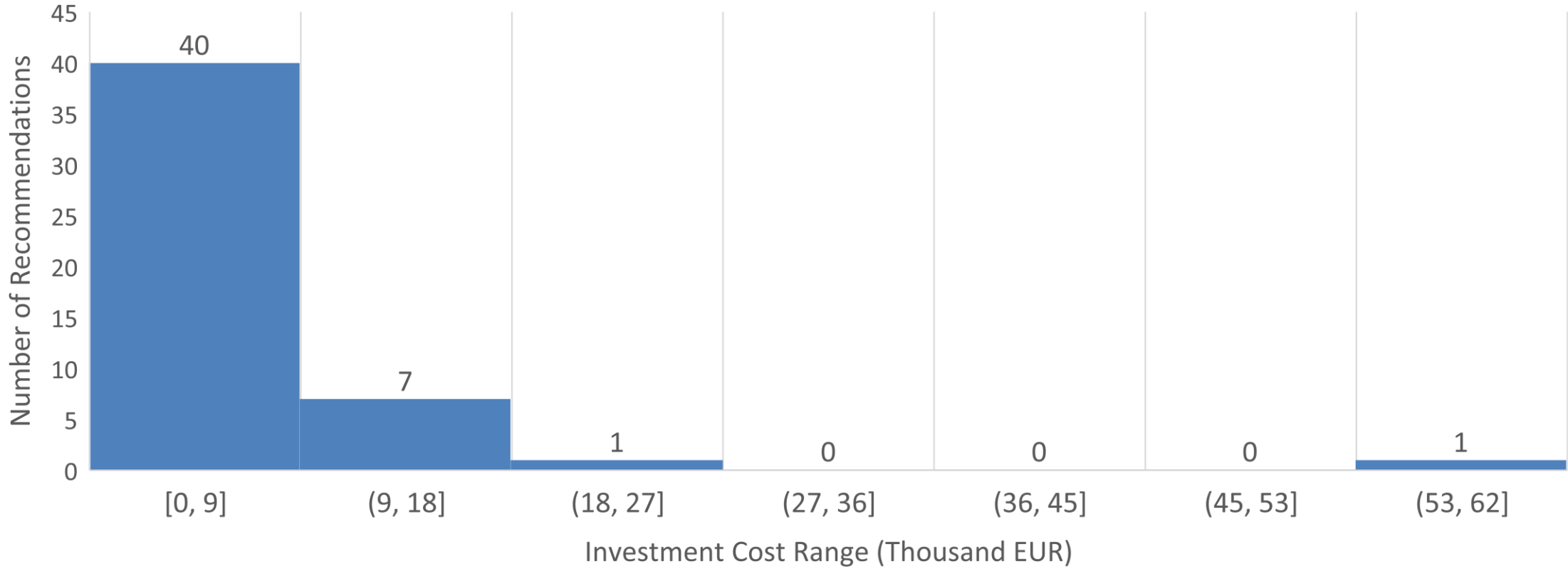
Average Payback Period Distribution (Months)



ENERGY MANAGEMENT

Study Findings: Energy Management

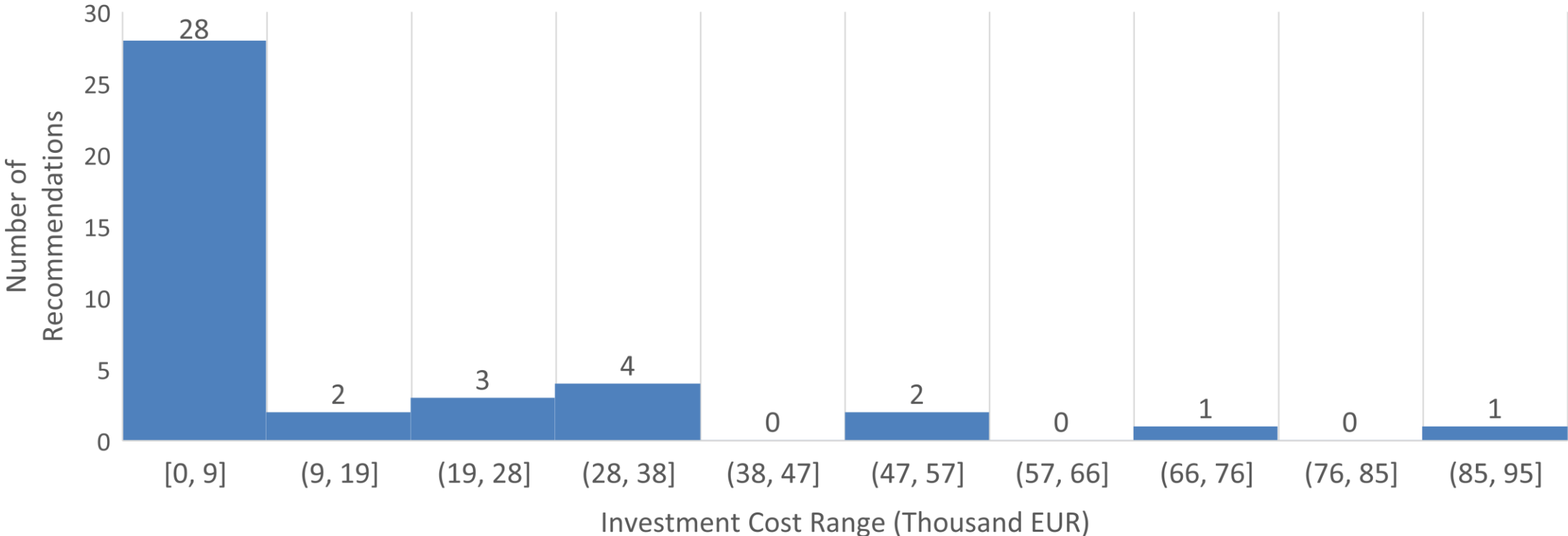
Investment Distribution for Energy Management Measures



POWER SUPPLY

Study Findings: Power Supply

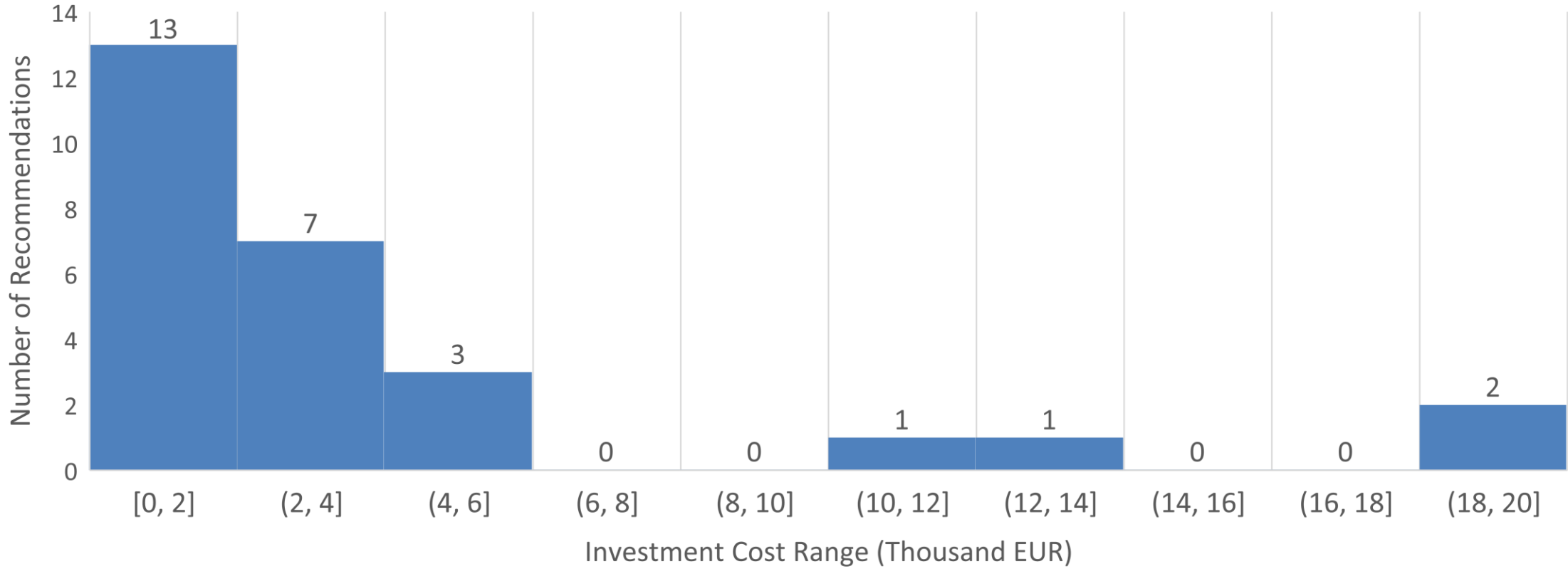
Investment Distribution for Power Supply Measures



REFRIGERATION

Study Findings: Refrigeration

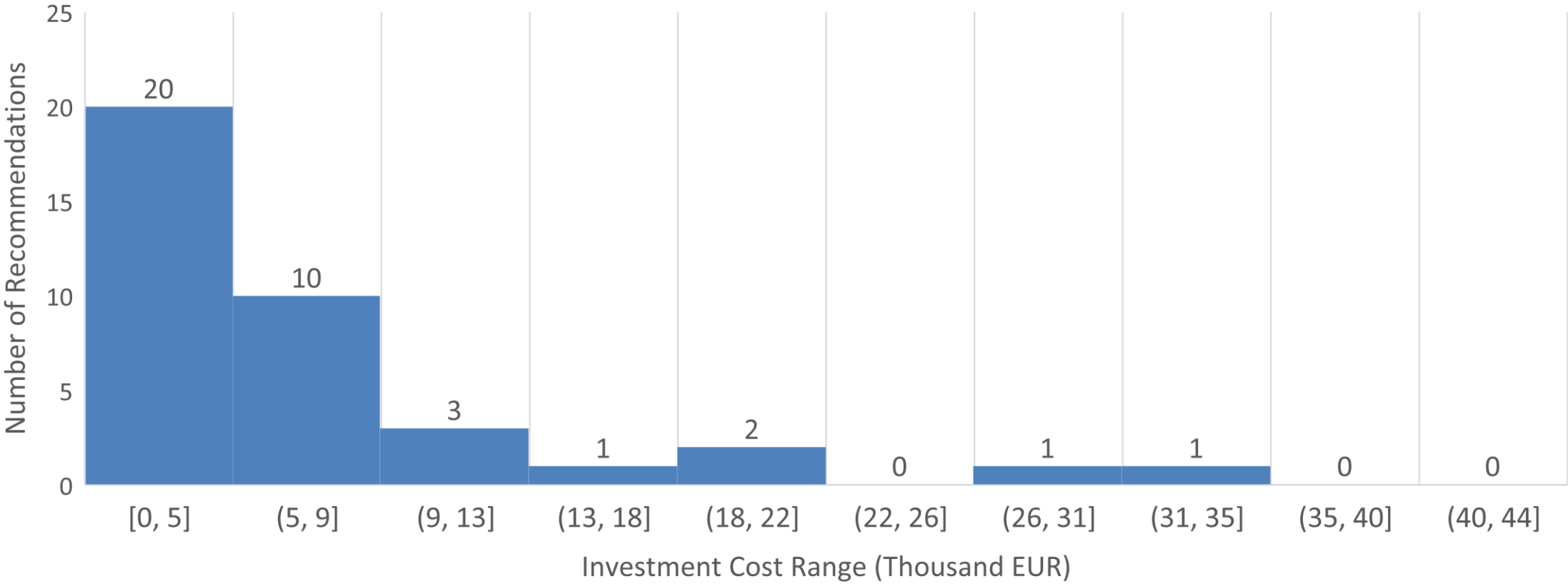
Investment Distribution for Refrigeration Measures



MOTORS, PUMPS & DRIVES

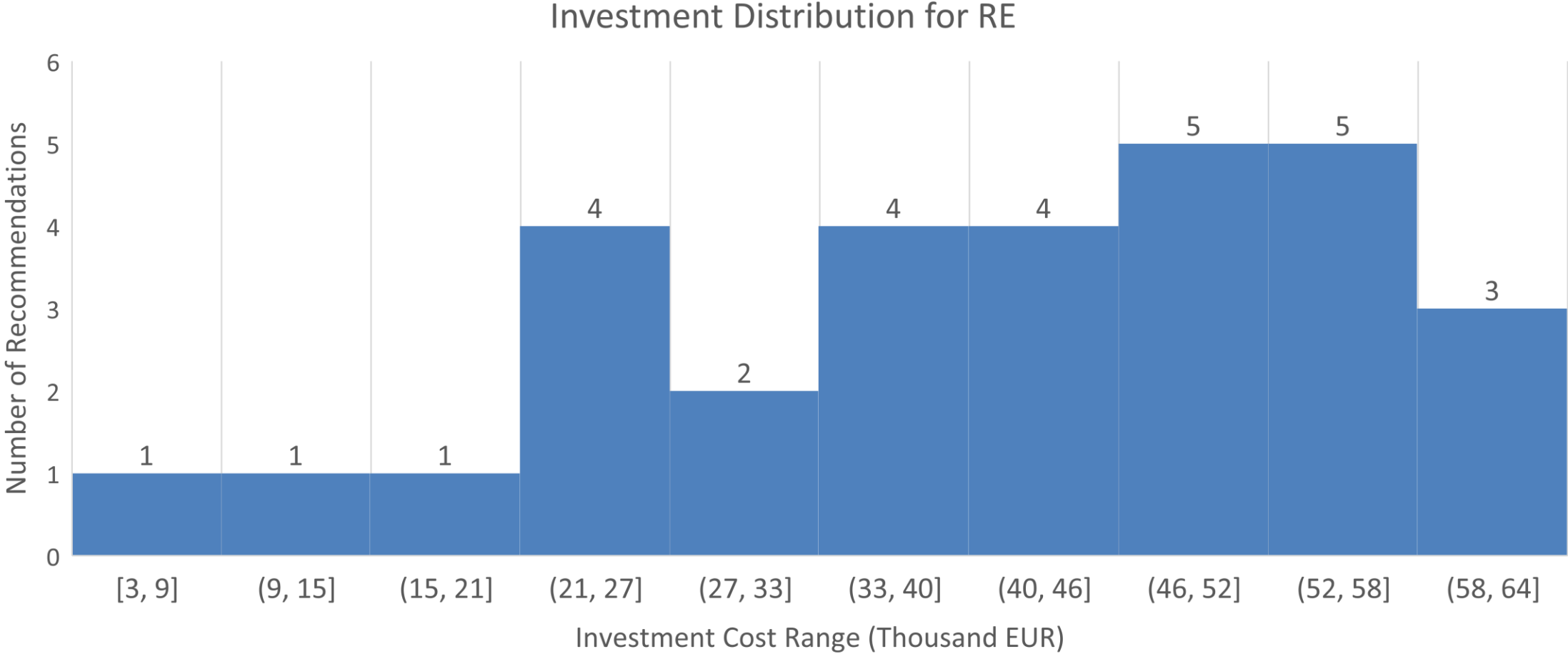
Study Findings: Motors, Pumps & Drives

Investment Distribution for Motors&Pumps



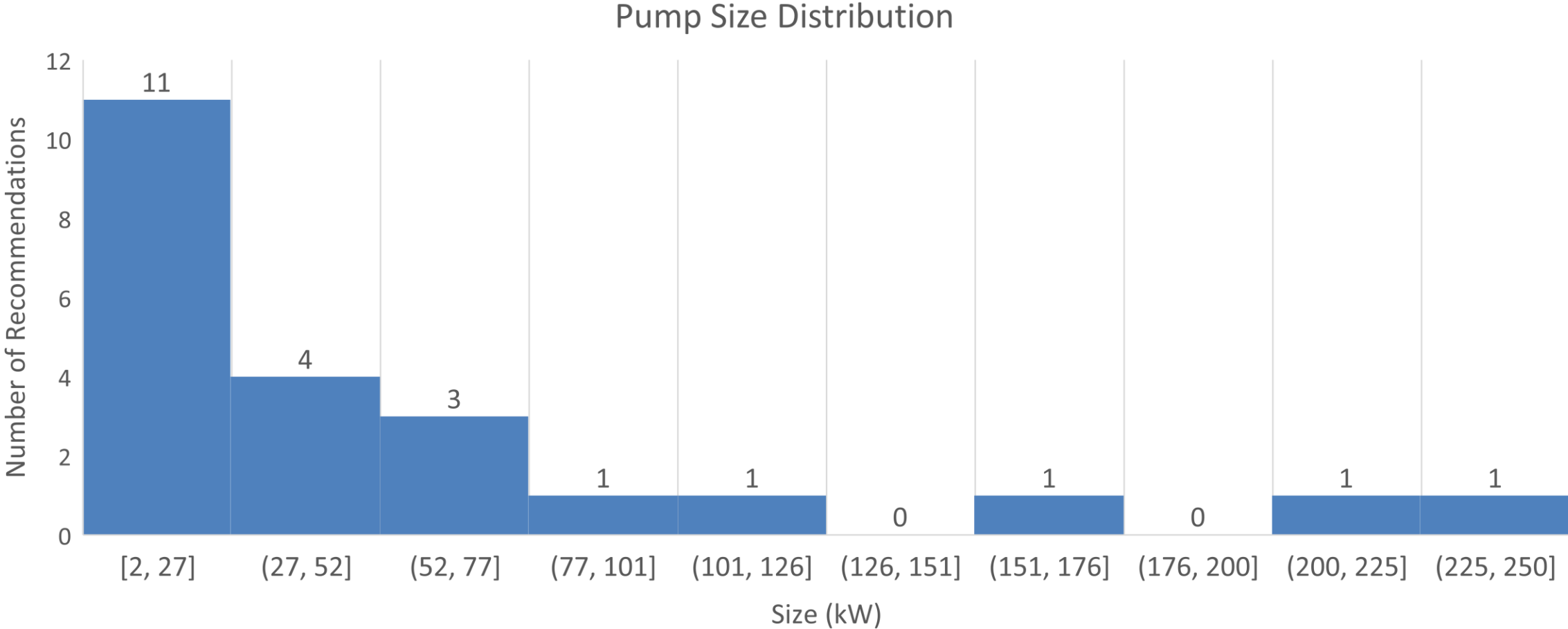
SOLAR PV

Study Findings: RE

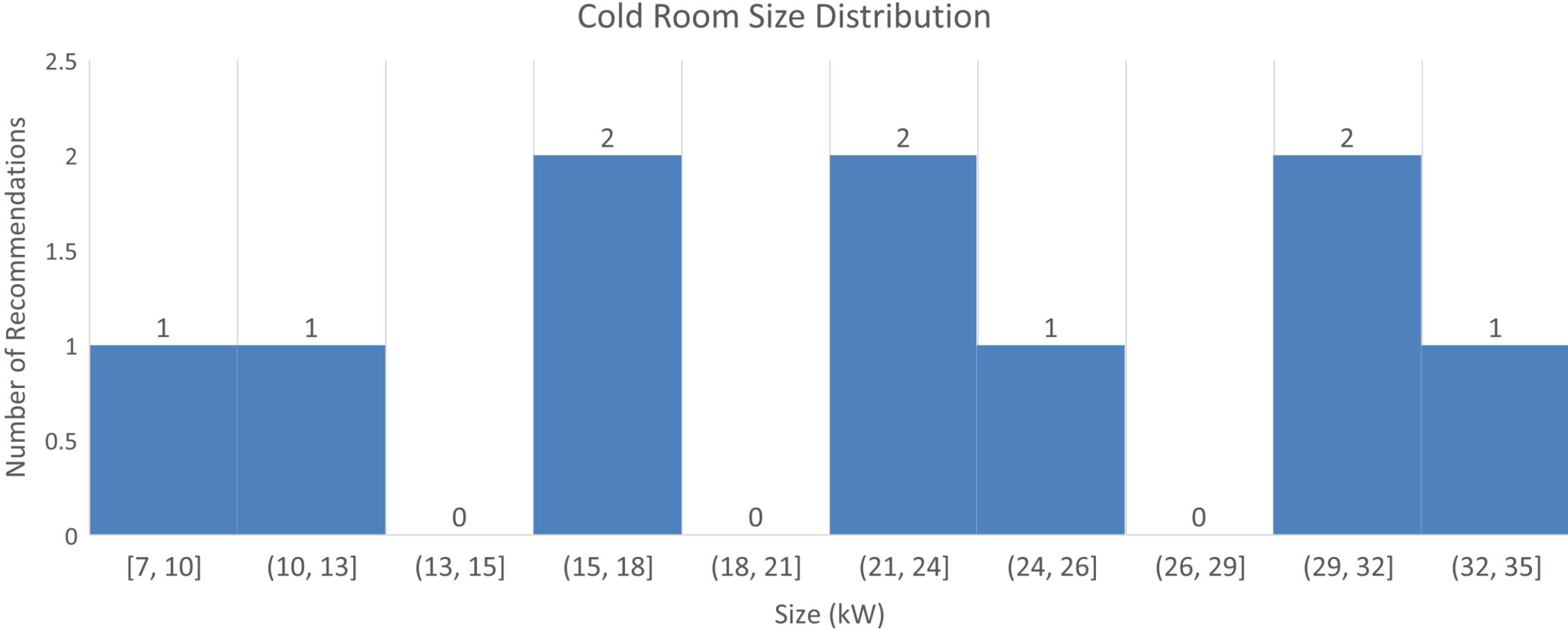


TECHNOLOGY SIZES

Technology Sizes: Pumps

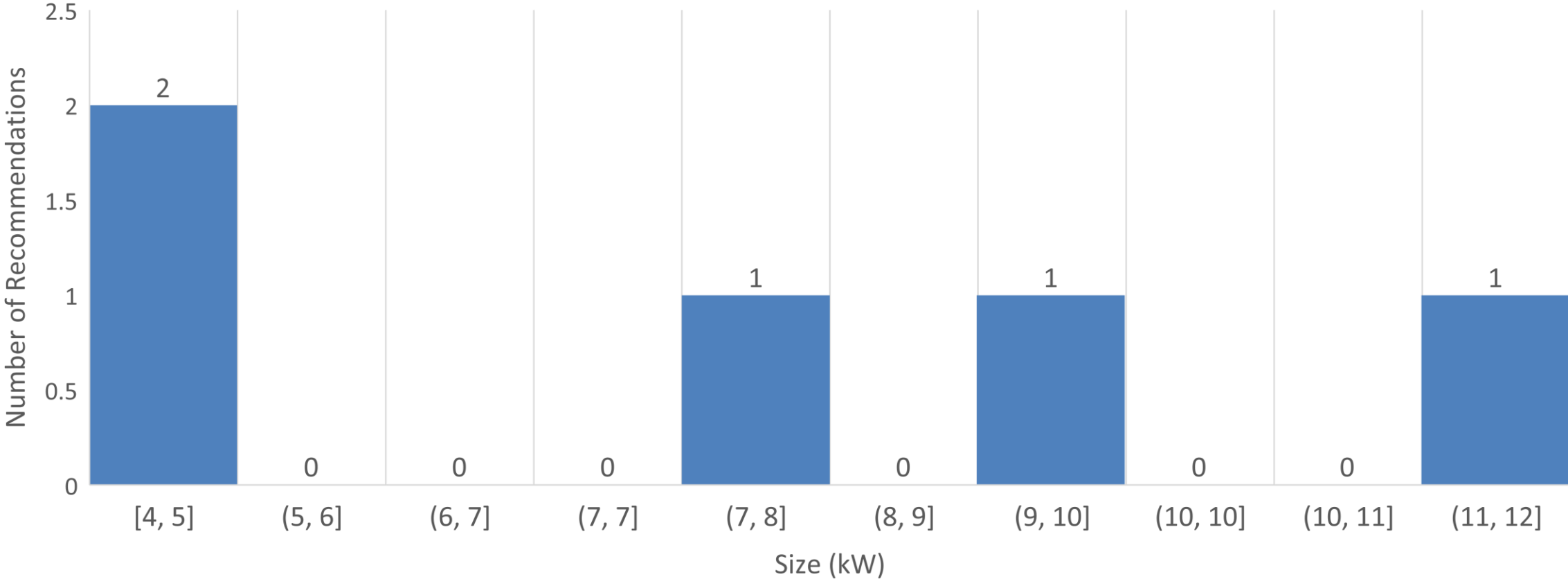


Technology Sizes: Cold Rooms



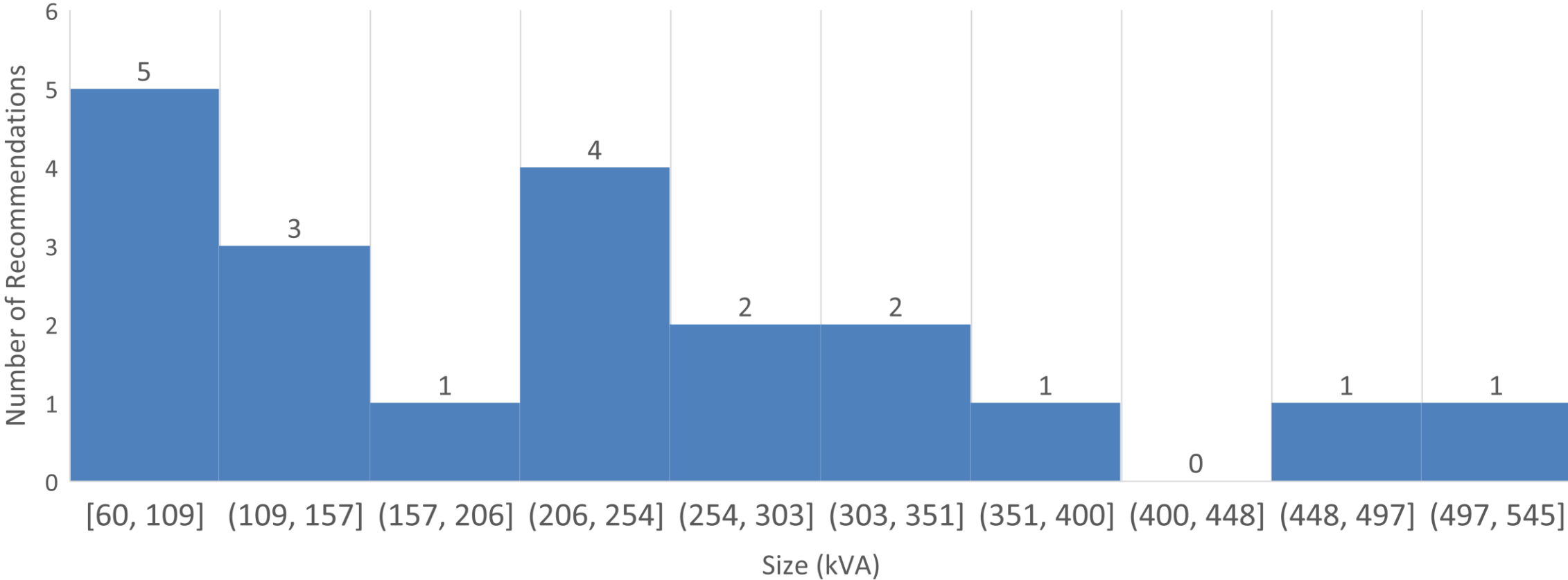
Technology Sizes: Cold Rooms Compressors

Cold Room Compressor Size Distribution



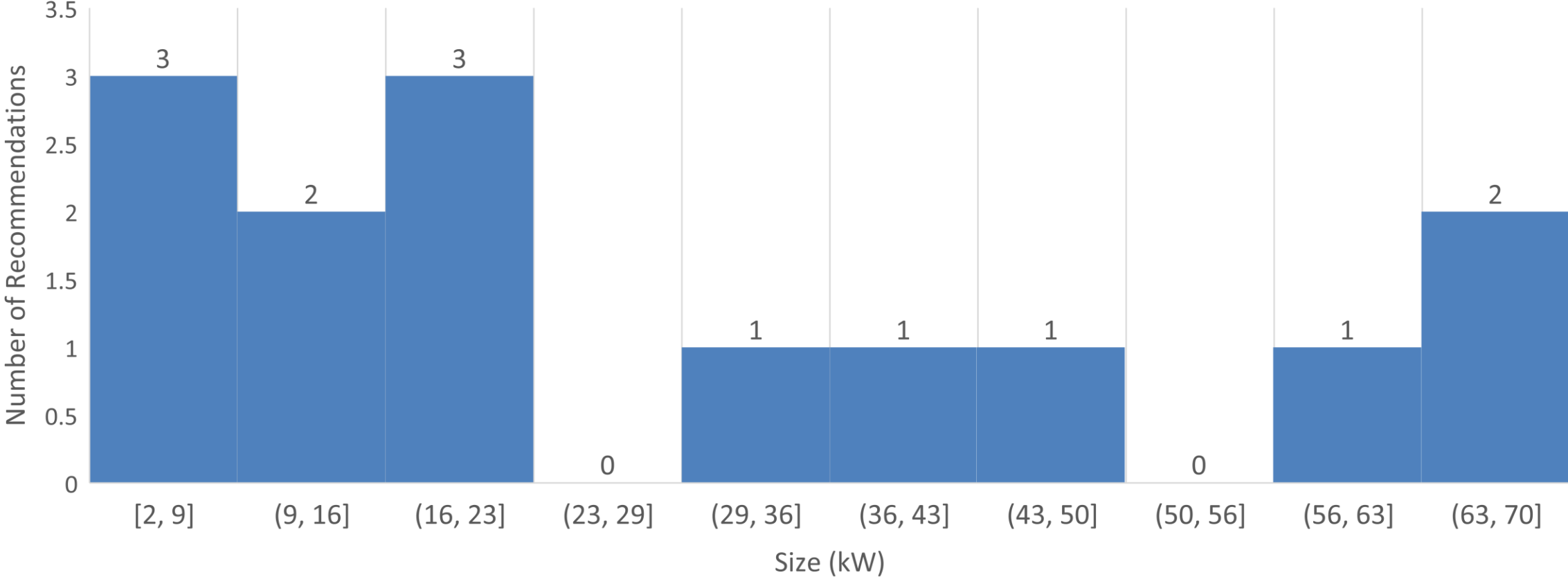
Technology Sizes: Diesel Generators

Diesel Generator Size Distribution



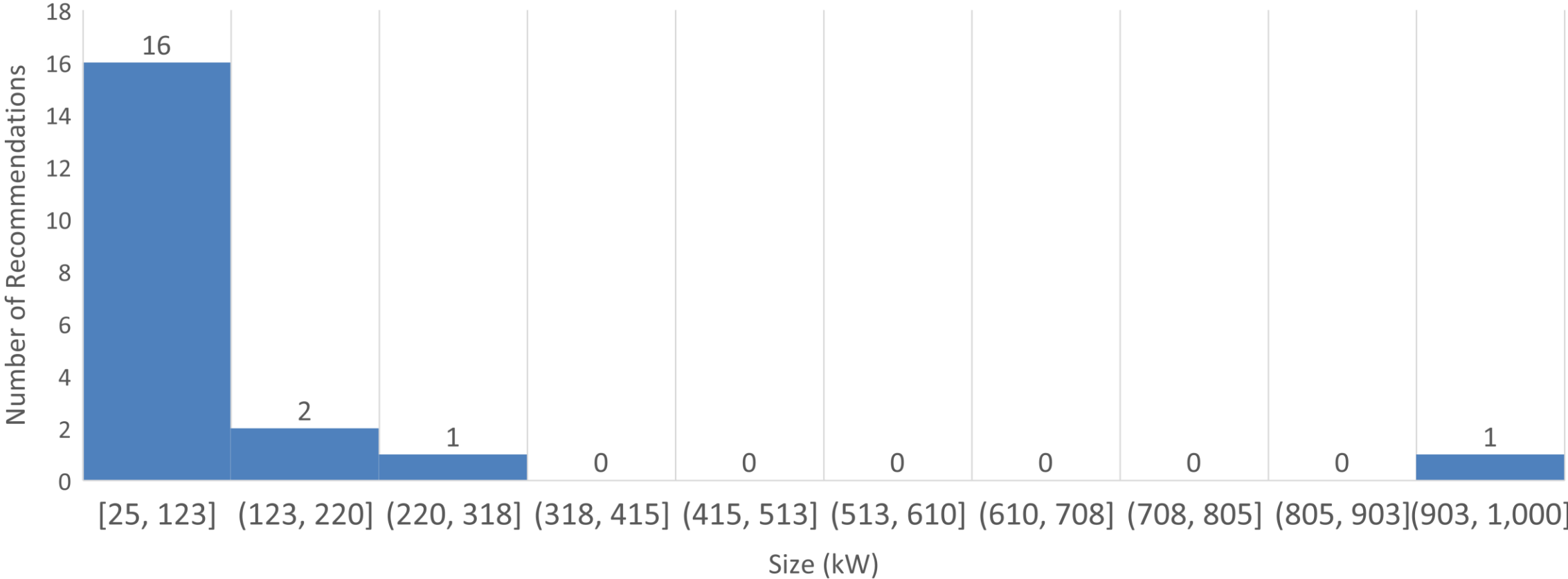
Technology Sizes: High Efficiency Motors

High Efficiency Motor Size Distribution



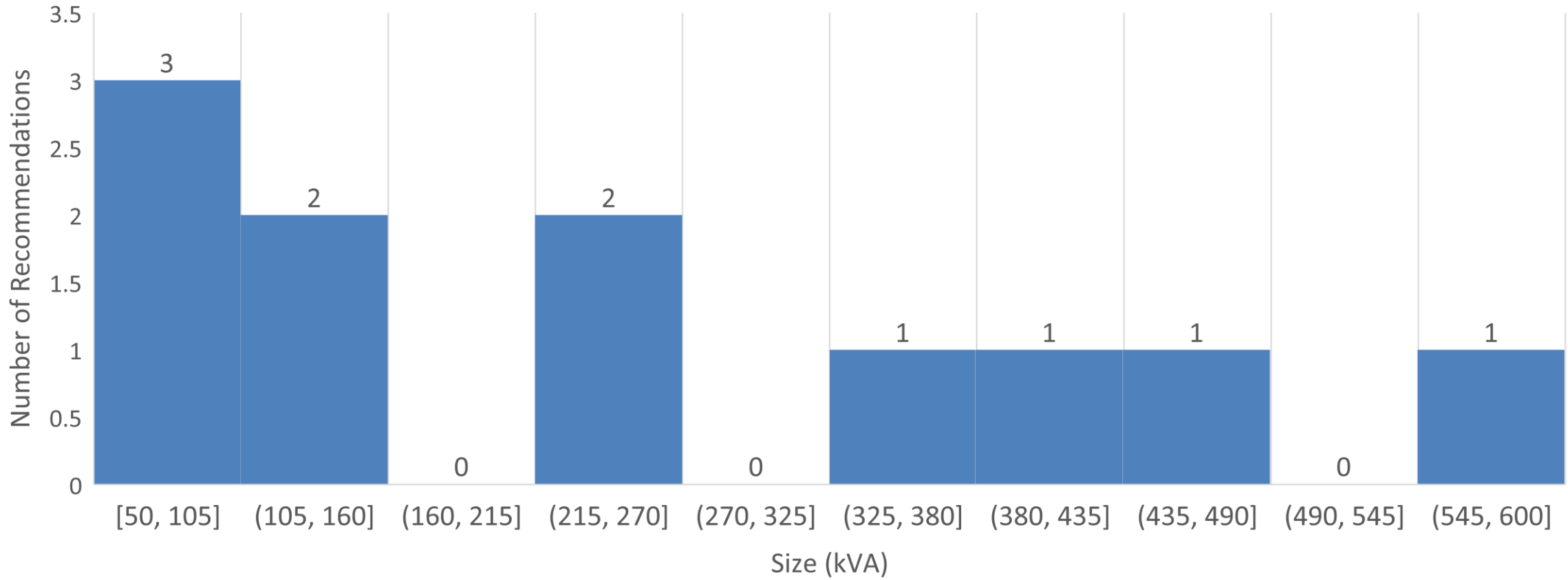
Technology Sizes: Solar PV

Solar PV Size Distribution

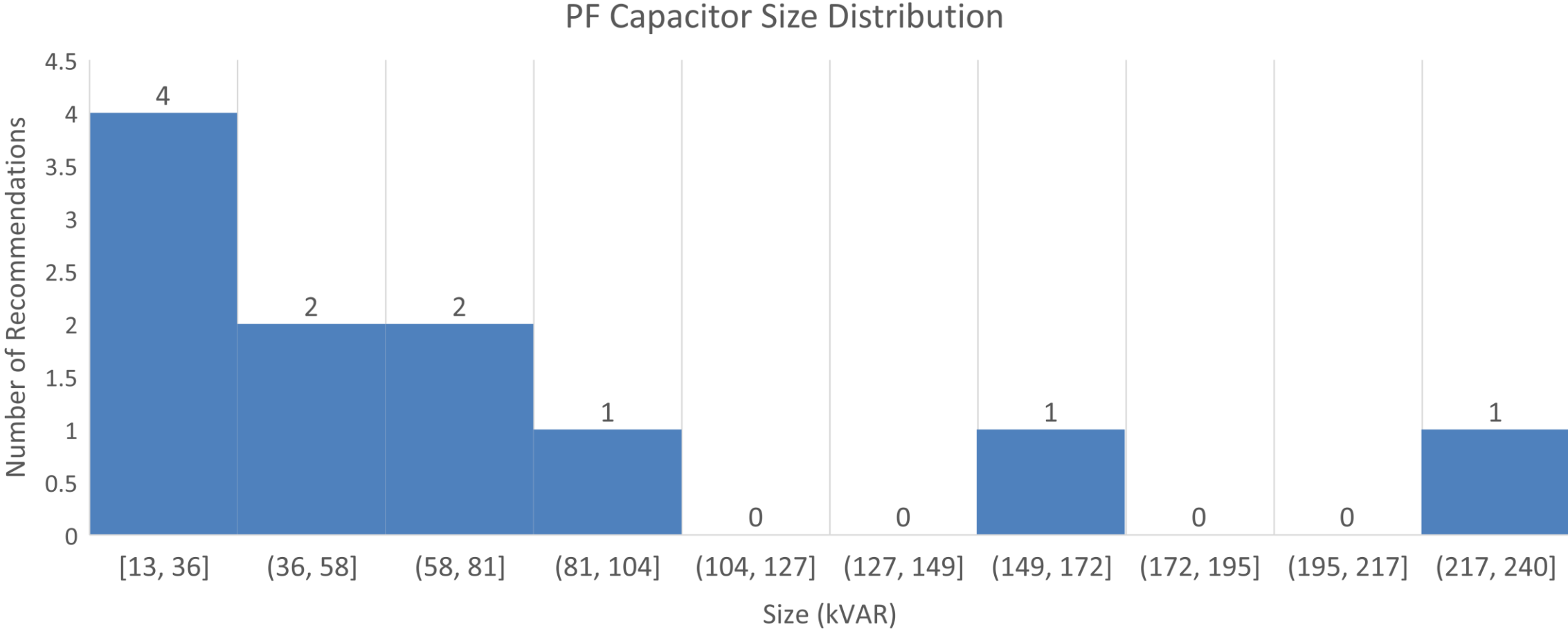


Technology Sizes: Voltage Optimiser

Voltage Optimiser Size Distribution

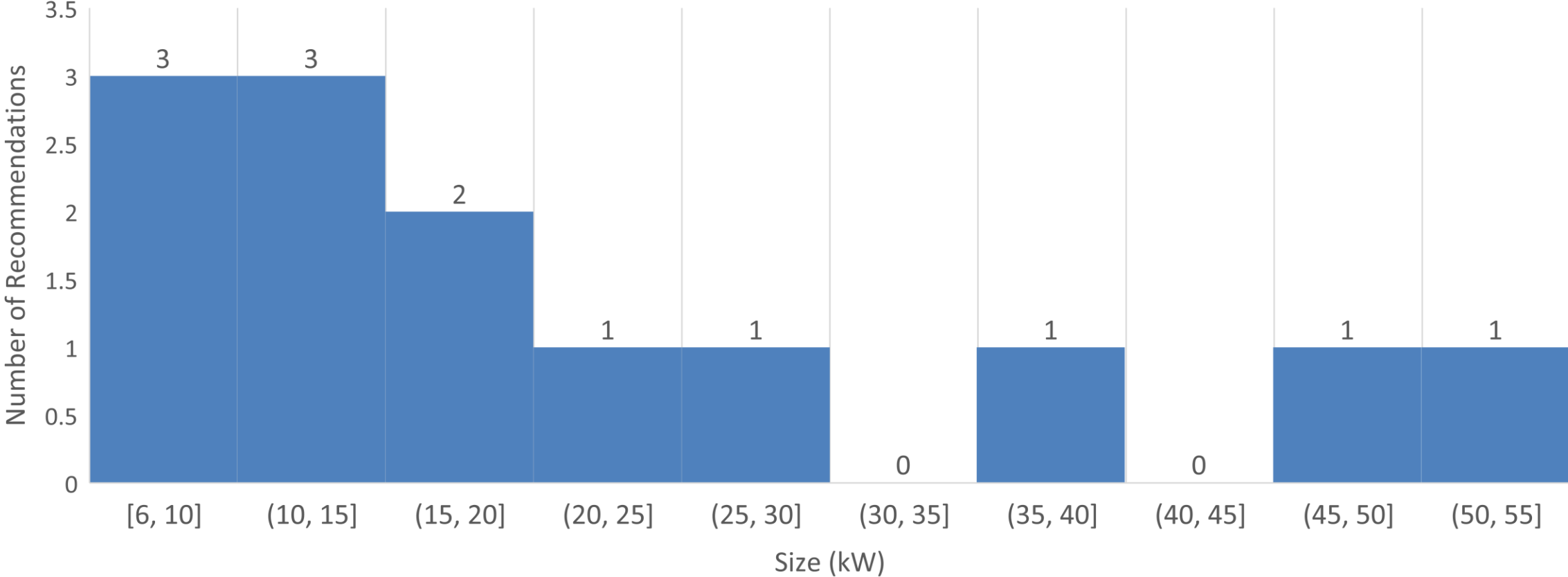


Technology Sizes: Power Factor Capacitors



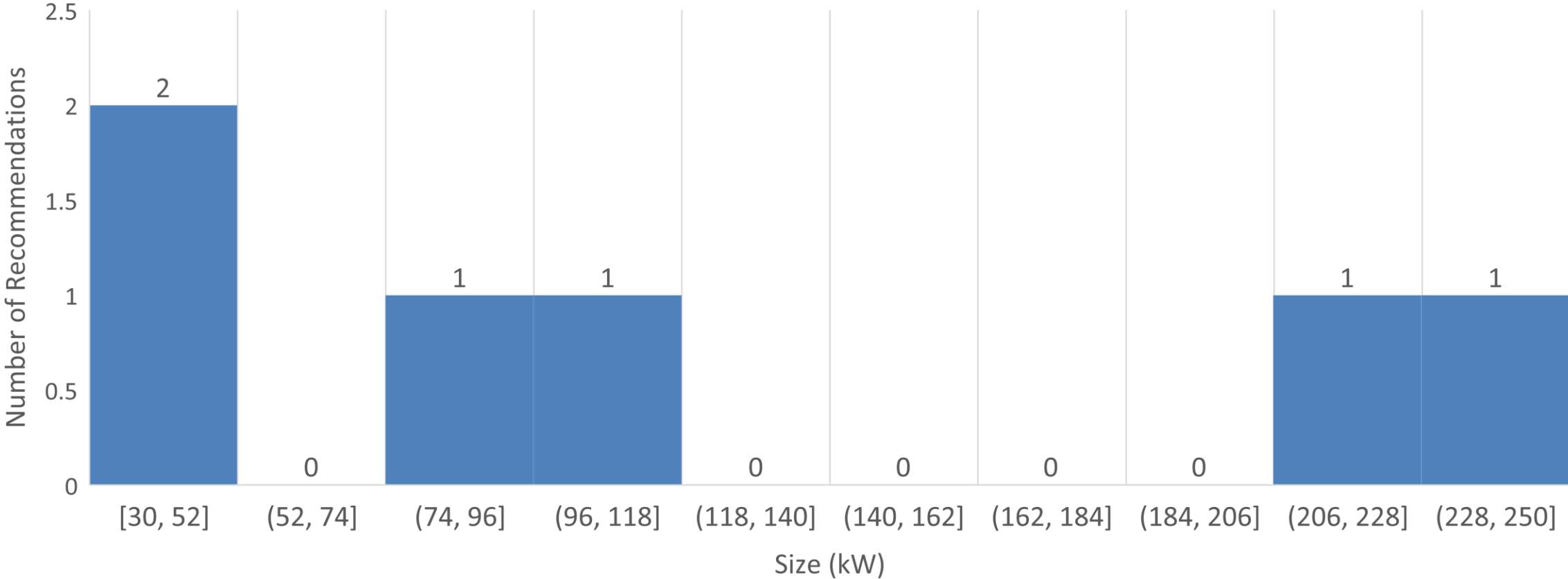
Technology Sizes: VFD/VSD

VFD Size Distribution



Technology Sizes: Soft Starters

Soft-Starter Size Distribution



Thank you for your time!
Q&A

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