

List of Figure

Figure 2. 1 Distribution Sustainable Aviation Fuel in an aircraft.....	11
Figure 2. 2 Common criteria used in the sustainable supplier selection studies.....	14
Figure 2. 3 Main components of a decision support system (Stanescu and Filip 2011).....	17
Figure 2. 4 The theoretical foundation for intelligent decision-making analysis of big data-driven industrial technologies (C. Li, Chen, and Shang 2022).	19
Figure 2. 5 AI-powered decision support solution for energy-intensive industrial facilities' preventative maintenance and production optimization (Confalonieri et al. 2015).....	21
Figure 2. 6 Designing decision support systems based on knowledge (Zaraté and Liu 2016).....	23
Figure 2. 7 Designing decision support systems based on knowledge (Zaraté and Liu 2016).....	25
Figure 2. 8 Standard structure and terminology of the decision tree	28
Figure 2. 9 Random Forest model.....	30
Figure 3. 1 Multi-Criteria Predictive Decision Framework for SAF Supplier Selection	41
Figure 3. 2 illustrates the general architectures of the models used in this study.	43
Figure 3. 3 The model development framework that was applied.....	44
Figure 3. 4 Flow of Research Methodology for Developing Predictive DSS in SAF Procurement	47
Figure 4. 1 Dataset Overview Table	49
Figure 4. 2 Flowchart of the data preprocessing steps applied in this research.....	50
Figure 4. 3 Comparison of Dataset Size Before and After Deduplication.....	52
Figure 4. 4 illustrates the number of missing values	53
Figure 4. 5 Example of feature emission intensity distribution Emission Intensity before and after outlier removal.	54
Figure 4. 6 Distribution of supplier scores generated through a rule-based scoring formula.....	56
Figure 4. 7 Split Dataset.....	57
Figure 4. 8 Sample label encoding for categorical feature: feedstock type and Regional.....	58
Figure 4. 9 Feature Importance – Random Forest	60
Figure 4. 10 Feature Importance – Recursive Feature Elimination	61
Figure 4. 11 Correlation Heatmap	62
Figure 4. 12 Wrapper method for training and feature subset	64
Figure 4. 13 Decision Tree Performance Evaluation and Learning Curve.....	65

Figure 4. 14 Random Forest Performance Evaluation and Learning Curve.....	65
Figure 4. 15 XGBoost Performance Evaluation and Learning Curve	65
Figure 4. 16 Model Performance Comparison.....	67
Figure 4. 17 ROC Curve Comparison of 3 Models	68
Figure 4. 18 Performance trends across scenarios for Decision Tree, Random Forest, and XGBoost	72
Figure 4. 19 Accuracy Comparison of Classification Models Across Feature Scenarios	73