

LIST OF FIGURES

Figure I.1 Graph Global Market Value Internet of Things	22
Figure II.1 IoT Model	27
Figure II.2 Technology for IoT Connectivity	29
Figure II.3 LoRaWAN Architecture	31
Figure II.4 LoRaWAN Packet Structure [13]	33
Figure III.1 Research Framework	44
Figure III.2 Smart Metering Architecture [20].	46
Figure III.3 Map of Bandung City[22].....	48
Figure III.4 Framework of Techno Economic Modelling.....	52
Figure III.5 Wirnet™ iStation Gateway.....	56
Figure III.6 Business Model Scenario.....	58
Figure III.7 IoT Cost Design Considerations [30]	59
Figure IV.1 LoRaWAN Parameter Correlation based on Spreading Factor.....	69
Figure IV.2 Capacity Planning Calculation	70
Figure IV.3 Coverage Planning Calculation	71
Figure IV.4 Comparison Between Coverage Calculation and Capacity	71
Figure IV.5 LoRaWAN Coverage on Antares Network in Bandung	72
Figure IV.6 Comparison Number of Gateways between LoRaWAN demand and ANTARES	72
Figure IV.7 LoRaWAN planning Coverage Based on Signal Level in Bandung City	76
Figure IV.8 Coverage by Signal level of Antares Services	78
Figure IV.9 LoRaWAN Coverage by SNR in Bandung City	79
Figure IV.10 SNR Calculation Coverage by Antares Services.....	80
Figure IV.11 LoRaWAN Throughput in Bandung City	82
Figure IV.12 Throughput Calculation of Coverage by Antares Service.....	84
Figure IV.13 Comparison Capex of PLN and ANTARES	89
Figure IV.14 Comparison Opex of PLN and Antares.....	92
Figure IV.15 Graph Revenue as IoT Company (Antares) Scenario	94

Figure IV.16 Graph Revenue as PLN Scenario	95
Figure IV.17 Comparison NPV between ANTARES and PLN	96
Figure IV.18 Comparison Cumulative Net Cash Flow Antares & PLN.....	99
Figure A.0.1 Wirnet iStation - Product Description.	115