**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

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| Date | 26 june 2025 |
| Team ID | LTVIP2025TMID32104 |
| Project Name | sustainable smart city assistant using ibm granite llm |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

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| --- | --- | --- |
| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
| FR-1 | Policy Document Summarization | Upload document → Summarize using IBM Granite LLM |
| FR-2 | Citizen Feedback Collection | Form-based input → Categorized logging via FastAPI |
| FR-3 | KPI Forecasting | Upload KPI CSV → Forecast water/energy consumption using ML |
| FR-4 | Eco Tips Generation | Keyword input → Generate eco-friendly tips via AI |
| FR-5 | Anomaly Detection | Upload CSV → Flag abnormal spikes in KPIs |
| FR-6 | Chat Assistant | Ask sustainability questions → Get real-time answers from IBM Granite LLM |
| FR-7 | Semantic Policy Search | Search policy content → Retrieve top matches using Pinecone semantic search |
| FR-8 | Sustainability Report Generation | Upload KPI data → Generate formatted city report in Markdown/PDF |

**Non-functional Requirements:**

Following are the non-functional requirements of the proposed solution.

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| --- | --- | --- |
| **NFR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | Usability | Interactive and themed Streamlit UI with sidebar navigation |
| NFR-2 | Security | API key management via .env, no hardcoded secrets |
| NFR-3 | Reliability | Stable backend via FastAPI, tested routes with error handling |
| NFR-4 | Performance | Fast API response, minimal latency using optimized routes |
| NFR-5 | Availability | Supports real-time interactions via two-way data binding |
| NFR-6 | Scalability | Modular codebase, Pinecone/Watsonx integrations are cloud-ready |