

# **NON-INTERCONNECTED ISLANDS SYSTEM & MARKET OPERATOR**

## **Project Implementation of the Athens Central Energy Control Center (ECC) and the Local ECC for the Electrical Power System in Rhodes**

### **TECHNICAL AND FUNCTIONAL REQUIREMENTS**

#### **PART D: CORPORATE SYSTEMS**

Athens, 28 November 2017

ECCO International, Inc.  
268 Bush Street, Suite 3633  
San Francisco, California, US 94104

## Contents

1	Introduction .....	1-1
2	Data Warehouse/MIS .....	2-1
2.1	General .....	2-1
2.2	Subject Areas Covered by the DW/MIS .....	2-2
2.2.1	NII SMO System Operations .....	2-2
2.2.2	NII SMO Market Operations .....	2-2
2.2.3	Helpdesk.....	2-2
2.2.4	Costing and Profitability .....	2-3
2.2.5	Strategy, Performance Management and Score-cards .....	2-3
2.2.6	Ad Hoc Reporting .....	2-3
2.3	Corporate DW/MIS Overview .....	2-3
2.4	DW/MIS Functional Requirements .....	2-5
2.4.1	DW .....	2-5
2.4.2	Extraction Transformation & Loading.....	2-6
2.4.3	MIS .....	2-6
2.5	DW/MIS Infrastructure Overview.....	2-7
2.6	DW/MIS Detailed Design & Dimensioning.....	2-8
2.6.1	DW: Dimensions.....	2-8
2.6.2	Analysis/Reporting.....	2-13
2.7	Data Migration from Former Systems .....	2-16
3	Helpdesk .....	3-1
3.1	Scope and Business Goals of the Helpdesk .....	3-1
3.2	Helpdesk Objectives .....	3-3
3.3	Standardized Solution .....	3-3
3.4	Helpdesk System Functional Requirements.....	3-4
3.4.1	Full Support of Incident Management (Trouble - Ticketing) .....	3-4
3.4.2	Full Support of Knowledge Management.....	3-10
3.4.3	Support of Service Level/Contract Management .....	3-12
3.4.4	Business Processes – Analysis per Business Area (Modules) .....	3-13

3.5	Technical Specifications .....	3-15
3.5.1	General.....	3-15
3.5.2	Security.....	3-16
3.5.3	Availability.....	3-17
3.5.4	Software Specifications.....	3-17
3.5.5	Helpdesk Integration to SMO's IT System .....	3-20
3.5.6	Helpdesk Infrastructure.....	3-20
3.5.7	Detailed Design & Dimensioning .....	3-21

## List of Tables

<b>Table 2-1.</b> DW Dimensions .....	2-8
<b>Table 2-2.</b> DW Measures per Dimension .....	2-11
<b>Table 2-3.</b> MIS Reporting .....	2-13
<b>Table 3-1.</b> Helpdesk-related Customer Group Definition.....	3-1
<b>Table 3-2.</b> Types of Request .....	3-2
<b>Table 3-3.</b> “Customers” needs vs. Helpdesk modules.....	3-13

## List of Figures

<b>Figure 2-1.</b> DW/MIS Overview .....	2-2
<b>Figure 2-2.</b> DW/MIS Architecture .....	2-3
<b>Figure 2-3.</b> DW/MIS Hierarchy .....	2-4
<b>Figure 2-4.</b> Design of the DW .....	2-5
<b>Figure 2-5.</b> DW/MIS Infrastructure.....	2-7
<b>Figure 3-1.</b> Inception Diagram for the Multi-Tier of Support Based on the Type of Request.....	3-3
<b>Figure 3-2.</b> Helpdesk Infrastructure .....	3-20

## List of Acronyms

<b>APP</b>	Application
<b>BI</b>	Business Intelligence
<b>CHP</b>	Combined Heat Power
<b>CTI</b>	Computer Telephony Integration
<b>DB</b>	Database
<b>DBMS</b>	Database Management System
<b>DW</b>	Data Warehouse
<b>ECC</b>	Energy Control Center
<b>EMS</b>	Energy Management System
<b>ETL</b>	Extraction Transformation & Loading
<b>FAQ</b>	Frequently Asked Question
<b>FTE</b>	Full Time Equivalent
<b>GUI</b>	Graphical User Interface
<b>HIS</b>	Historical Information System
<b>HMI</b>	Human Machine Interface
<b>HV</b>	High Voltage
<b>H/W</b>	Hardware
<b>IT</b>	Information Technology
<b>KB</b>	Knowledge Base
<b>KPIs</b>	Key Performance Indicators
<b>LDAP</b>	Lightweight Directory Access Protocol
<b>LTO</b>	Linear Tape-Open
<b>LV</b>	Low Voltage
<b>MIS</b>	Management Information System
<b>MMS</b>	Market Management System
<b>MV</b>	Medium Voltage
<b>NII SMO</b>	Non-Interconnected Islands System and Market Operator
<b>OLAP</b>	Online Analytical Processing
<b>OLTP</b>	Online Transaction Processing

<b>OS</b>	Operating System
<b>PBX</b>	Private Branch Exchange
<b>PPC</b>	Public Power Corporation
<b>PV</b>	Photovoltaic
<b>RAID</b>	Redundant Array of Independent Disks
<b>RAE</b>	Regulatory Authority for Energy
<b>RES</b>	Renewable Energy Sources
<b>ROLAP</b>	Relational Online Analytical Processing
<b>RTLS</b>	Real-Time Data Recording and Logging System
<b>SLA</b>	Service Level Agreement
<b>SSL</b>	Secure Sockets Layer
<b>SSO</b>	Single Sign On
<b>SW</b>	Software

# 1 Introduction

In this section, the requirements for the Corporate Systems are provided. Corporate systems include:

- Data Warehouse / Management Information System (DW/MIS);
- Helpdesk System,

The Corporate Systems will be installed at the Central Energy Control Center (ECC) in Athens. Apart from the needs of the Central ECC, they should support the market and system operations of the island of Rhodes, and the systems located in the Local ECC. They should also be easily expandable to accommodate future expansions to the 32 NII.

Detailed requirements for DW/MIS are listed in Section 2, and for Helpdesk in Section 3.

## **2 Data Warehouse/MIS**

### **2.1 General**

The Corporate Data Warehouse (DW) / Management Information System (MIS) should keep properly related up-to-date, aggregated, accurate, and critical information to provide the Non-Interconnected Islands System and Market Operator (NII SMO) the capability to monitor, analyze and report the main corporate business processes and to support the management decision process.

The Data Warehouse (DW) system is integrated with the Management Information System (MIS) and hosted in a common infrastructure.

The MIS should use DW information to cover the needs of timely decision support, forecasting based on historical analysis and variance analysis (comparisons) by using appropriate Business Intelligence (BI) capabilities.

The NII Operational Systems are constantly producing large amounts of data that are stored in the respective databases and are preserved online, available, for specific time periods and then are archived. These different types of data are detailed, accurate but are not related to the data of the other operational systems.

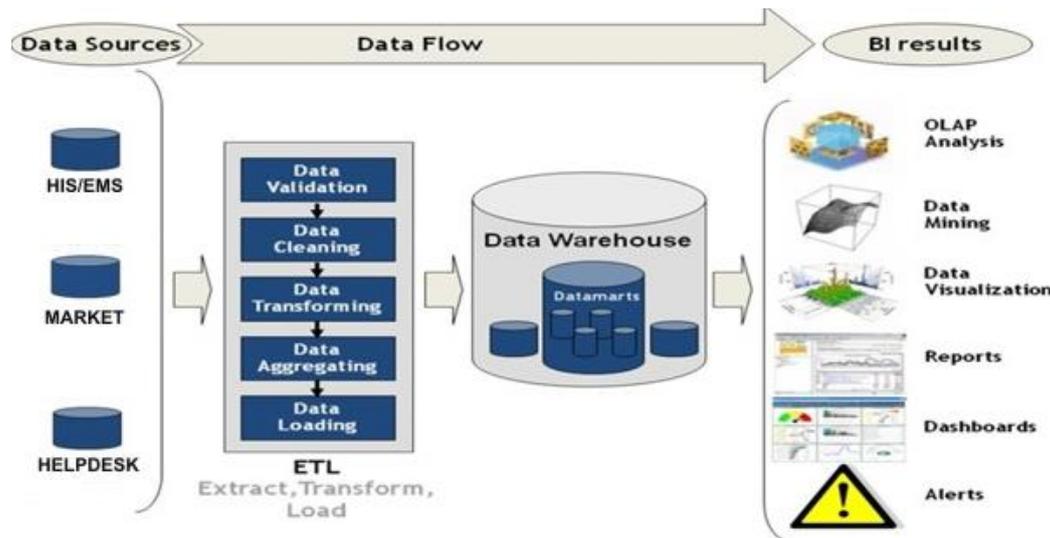
The DW will collect all vital information needed to support the above processes; the information is stored in the respective operational databases (OLTP) of the NII SMO IT Operational Systems, that are the Energy Management System (in Rhodes), the Market Management Systems (in Athens and Rhodes), and Helpdesk System (in Athens). Data mining, statistical analysis, business intelligence and reporting tools will be used by the DW/MIS System to build a modern system based on the latest hardware and software technology.

The DW system overview, which meets the main NII SMO functional requirements, is presented in Figure 2-1, along with the respective data sources, data flow and BI results.

This paradigm provides a clear and methodological approach for extracting data from the operational databases, transform the data into information, load and organize the information within the Data Warehouse and the Data Marts; then, the data are processed with the MIS BI tools to produce OLAP analysis, data mining, data visualization, reports, dashboards, and alerts.

The DW should serve as the “single source of truth” and the MIS system outputs should be the basis for the justification of business decisions and actions taken.

BI capabilities (OLAP, Metrics, Key performance indicators - KPIs etc.) are needed for a better decision making process and appropriate Business Intelligence tools should be provided.



**Figure 2-1. DW/MIS Overview**

Ad Hoc Reporting, free of structure and parameters reporting should be provided for the NII SMO personnel and executives.

A full range of free analytical possibilities should be provided.

## **2.2 Subject Areas Covered by the DW/MIS**

The "subject areas" of the DW are defined as collections of related information on a specific important business subject. Using BI tools, data warehousing provides benefits of enabling views of subject area, characteristics and analytical possibilities.

The main business subject areas that should be covered by DW are related with the main NII SMO operational activities that are as follows:

### **2.2.1 NII SMO System Operations**

This area covers analysis, reporting and forecasting based on historical data and recent influential factors data of the energy generation, network flows, consumption, status of the network, losses, weather, load, forecasts.

### **2.2.2 NII SMO Market Operations**

This area covers analysis, reporting and forecasting based on historical data and recent influential factors of the MMS Applications data, scheduling results, costs, energy data, demand, production, dispatch orders and deviations data.

### **2.2.3 Helpdesk**

Helpdesk performance will also be monitored through specific KPI's.

### 2.2.4 Costing and Profitability

This is the capability to allocate direct cost per activity and calculate cost and profitability for each dimension (Multi-dimensional) (i.e., per product, per customer category, etc.).

### 2.2.5 Strategy, Performance Management and Score-cards

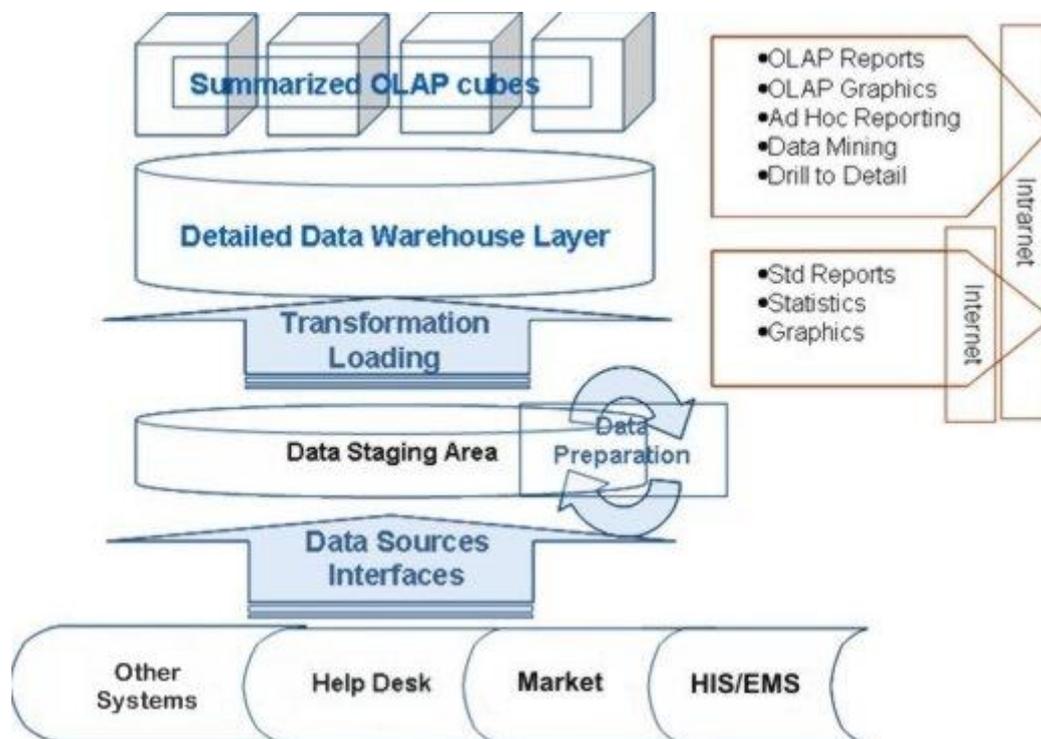
This area refers to the development of an essential set of KPIs that cover all major aspects of the organization’s strategy implementation. The measurement of the strategy implementation results is the proof of success but also an alerting mechanism for correcting actions on time. The decision about the KPIs to be monitored will be based on the internationally recognized methodologies.

### 2.2.6 Ad Hoc Reporting

This capability offers free of structure and parameters reporting as demanded by the NII SMO personnel and executives. Although it is not a specific subject area, it should provide a full range of free analytical possibilities.

## 2.3 Corporate DW/MIS Overview

The architecture of the DW/MIS system is presented in the following Figure.



**Figure 2-2.** DW/MIS Architecture

The basic data sources for the DW are the respective productions databases that are supporting the NII SMO systems. These are:

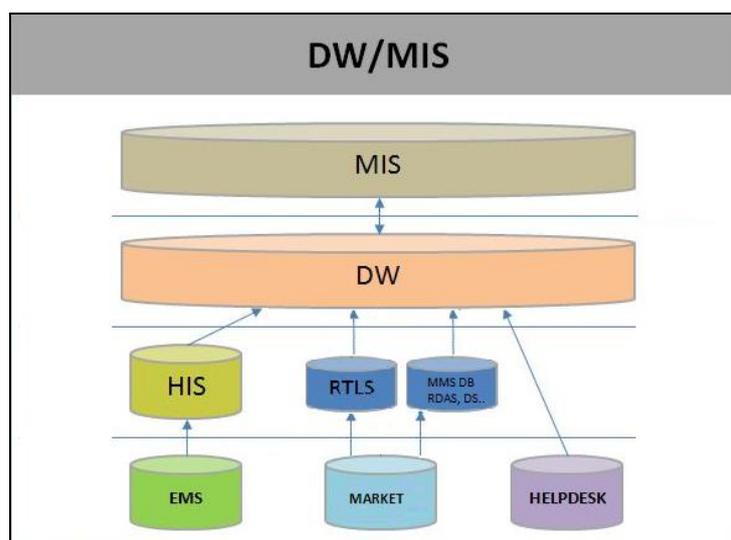
- The Historical Information System of the Energy Management System;
- The Market Management System;
- The Helpdesk System.

Automated processes load the various layers of the DW from the lowest level of detail data to the most aggregated as needed. All layers can serve as information feeders to the information exploitation layer applications according to the needs, varying from the analyst to the strategic executive, and with data ranging from recent data (depending on the operational application) to data further into the past. For the implementation of the various layers of the data warehouse probably more than one database engine technologies will be required (relational, OLAP, ROLAP, or other) depending on the technology provider.

The DW feeds then the OLAP cubes and MIS Applications.

Any group of users, decision makers, statisticians or members of a specific business unit should have a specific set of information (data mart) on some layers of the data warehouse and business intelligence applications. Furthermore, the access to data must be controlled in terms of user groups, area of interest, granularity etc. To do so, the vendor must provide an exact security policy that can be implemented uniformly across all employed tools.

The following Figure is a general diagram which shows the DW/MIS hierarchy.



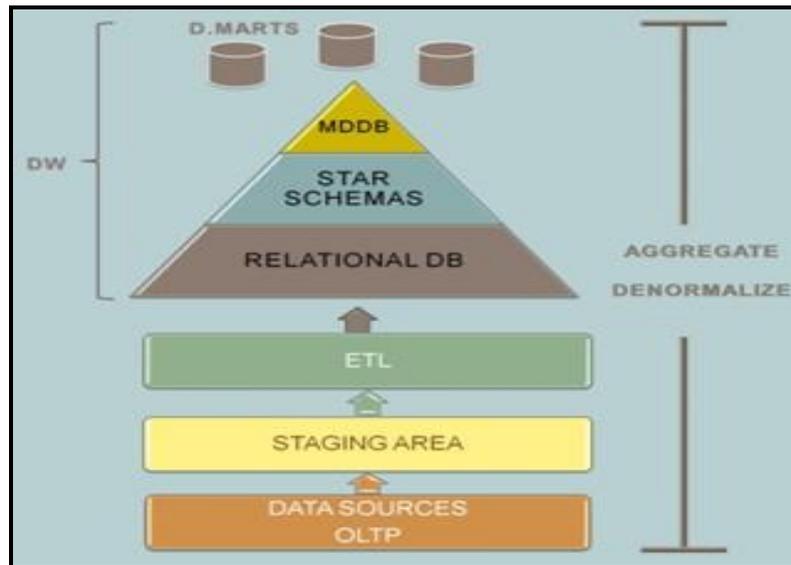
**Figure 2-3. DW/MIS Hierarchy**

## 2.4 DW/MIS Functional Requirements

The DW/MIS System should meet the following requirements:

### 2.4.1 DW

The design of the DW is presented in the following Figure.



**Figure 2-4.** Design of the DW

A Database Management System (DBMS) should host the DW to be accessed by end users mainly through exploitation tools and/or custom applications, as well as to feed data marts with data.

The Database Management System (DBMS) must be relational, enabling the Administrative Authority to implement the basic detailed layer of the DW model in a more normalized form.

Moving upwards to more aggregated and focused to the target user group data, OLAP multidimensional capabilities should also be available through the same DBMS or through another but ensuring seamless cooperation of the database engines. Facts and dimensions which are thematically relevant will be arranged in star schemas around subject areas.

Appropriate subsets of the DW, i.e., Data Marts, should be used to focus on a particular category of data, e.g., economic, operational etc.

Appropriate security mechanism of the DBMS should enable the Administrator to control access to the database, preventing unauthorized access to database objects and data. The DBMS must support security access even in terms of database objects, connections, resources, etc.

The security policy should reflect the various organizational levels, the needs, the level of expertise (e.g., power users) and the thematic relevance of the user groups. The administrator should be able to implement this policy by adhering to the Single Sign On (SSO) approach.

### **2.4.2 Extraction Transformation & Loading**

An integrated Extraction Transformation & Loading (ETL) application is required to perform the following:

- Handle and store metadata to the selected DW DBMS;
- Access and extract data from all available NII SMO data sources;
- Access and extract data from most commonly used office automation applications (Informal Data Sources);
- Implement Data Cleansing processes on the source data;
- Implement Transformation processes on the data from data sources, such as mapping to the DW schema, reformatting, recoding, merging, etc.;
- Schedule, run and monitor the above mentioned processes;
- Handle exceptions of the above mentioned processes and handle corrective actions either automatic or by user intervention;
- Provide all the above through a real time graphical and friendly user interface that will display the flow of tasks being executed.

The aggregation of the data from the source systems depends upon the importance of details needed for running business processes and for making decisions.

### **2.4.3 MIS**

The MIS consists of a set of applications that is hosted on the same environment with the Data Warehouse that uses the data stored in DW to provide the information to the end user in various forms.

The internet technology is the basis of the information publication inside and outside NII SMO by the use of intranet and internet respectively. The data publication to internal and external users should be finalized during the Detailed Design Phase of the Project.

The end user BI applications fall under the following categories:

- Corporate portal (NII SMO Web Site) for the public announcement of static reporting. The reports will need some standard criteria to run or show, but the internet infrastructure and the reports publication is not considered as part of the MIS procurement.
- NII SMO Portal for the issuing of the periodic static reports that will be defined and recorded in the reporting manual deliverable. The NII portal shall be incorporated within the corporate portal.

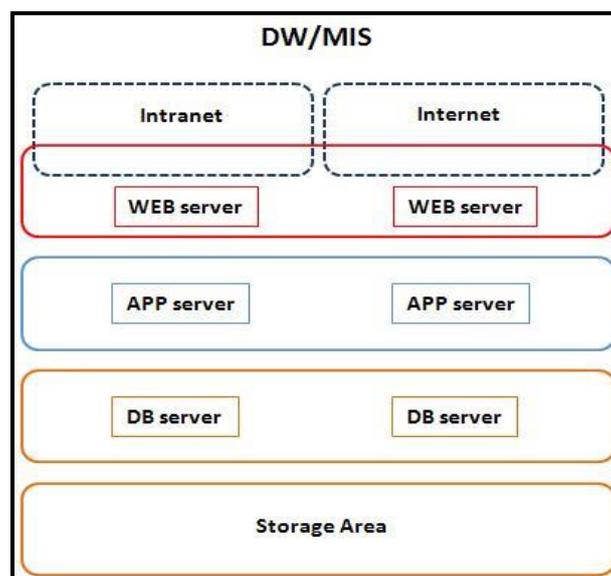
- Reporting application for the scheduled generation of the static reports. Static reporting include basic common business graphical forms like charts, pies, etc.
- OLAP applications for dynamic reporting and analysis of data cubes providing all classic manipulation on dimensional data like rotating, drilling, slicing and dicing. OLAP reporting should provide use of color coding knowing as highlighting or traffic lighting, graphic reporting, ranges, etc.
- Ad Hoc Reporting tools should be available to the end user through OLAP or the Generic Reporting Tool.
- Statistical applications for the analysis of the detailed data layers of the Data Warehouse for forecasting, data mining, etc.

All applications should be able to:

- Use and manipulate (manage) the same metadata as the ETL application, hiding the complexity of the database implementation from the end user and assigning meaningful business names to all involved objects.
- Force security rules in combination with the overall security policy.
- Export data to text files and all commonly used formats such as .pdf and .xls.
- Provide open connection interfaces to data sources in general, stored in the DW and all HEDNO IT systems.

## 2.5 DW/MIS Infrastructure Overview

The DW/MIS infrastructure overview is presented in the following Figure.



**Figure 2-5. DW/MIS Infrastructure**

## 2.6 DW/MIS Detailed Design & Dimensioning

The data from the operational databases, structure of the DW DB, the ETL process and the output of the statistical data analysis, presentation and reporting should be finalized in the Detailed Design Phase of the Project.

The Contractor should take into account future expansions of the HEDNO NII IT Systems. The Contractor should show how the systems provided are open and can accommodate future additions in terms of information and applications.

The following Tables, are indicative of the analysis capabilities of the DW in accordance to the needs of the NII SMO, and are outlined in order to define the project scope. The actual and complete set of tables requirements will be agreed during the Detailed Design Phase of the Project. "Dimensions" are all the data that can be used as "Categorical Variables" for the analysis. Levels are data Hierarchies that lie within each Dimension. "Measures" are the data to be analyzed.

### 2.6.1 DW: Dimensions

**Table 2-1.** DW Dimensions

Dimension	Levels
Time	Reliability year Calendar Year Quarter Month Day Hour 15'
Geographical	Domestic Regions Prefecture Municipality Substation
Electricity injection categories	Production
Production Unit Type	Dispatchable / Fully Controllable Dispatchable Conventional Units Dispatchable RES units with energy offers Partially Dispatchable / Controllable RES units Non-Dispatchable RES units Contracted etc.
Electricity Absorption categories	Consumption

Dimension	Levels
Consumption type	Consumption of electricity sector Eligible HV customers Distribution Network Auto-producers Pumping System Losses etc.
Production Units Registry	Production Unit Substation Measure Device
Customer Registry	Customers Substation Measure Device
Customer categories	Telemetered Non-telemetered etc.
System Boundary Registry	Substation Measure Device
Industry Categories (Business segments)	Industry Code Specific Industries Industry Areas
Electricity Capacity (Voltage level)	150 KV 20 KV 15 KV 400 V etc.
Transactional Categories	Producers Load Representatives Self supplied customers System Owner System Operator Distribution Network Owner Distribution Network Operator Network Operator for non interconnected islands Municipalities etc.
Customer type	HV customer MV customer LV customer

Dimension	Levels
Investment projects	Allocation of Expenses per project Civil Engineering Projects Electrical-Mechanical Engineering Projects Materials and Equipment Labour Cost Expropriations
Category of asset	Categories (Substations, Lines) Sub-Categories
Stock of reservoirs	Measurements for Hydroelectric Power Stations Measures per Reservoir
Fuel Classification	Hydro Storage hydro Run of river Pure pumped storage Mixed pumped storage Fossil Fuels Gas Oil Mixed Fuels Wind Other Renewable Biomass High efficiency combined heat and power (CHP) Photovoltaic (PV) e.g., $PV \leq 20kWp$ $20kWp \leq PV \leq 50kWp$ $50kWp \leq PV \leq 100kWp$ $100kWp \leq PV \leq 2MWp$ $PV \geq 2MWp$ etc. etc.
Unit implementation stage	With production licence With connection terms Under construction Synchronised In commissioning operation In commercial operation Installed power With commercial contract but not in operation

Dimension	Levels
	With installation licence In testing mode With connection contract
Dispatch Instruction type	MIN MAX FIX UP DOWN
Grid categories	System Network MV LV
System connection type	System boundary Renewable Non renewable HV customer
Participant	Having production licence Having supplier licence
Energy	Calculated Energy Metered Production Output Production Net Production Metered energy consumption Net Consumption General Auxiliaries Other unit consumptions Total Losses etc.

**Table 2-2. DW Measures per Dimension**

Measures	Dimensions
Amount	Time Geographical Electricity Absorption categories Electricity injection categories Customer Registry Industry Categories (Business segments) Transactional category Investment projects Category of asset

Measures	Dimensions
	Production unit type Consumption type Fuel Classification
Price/Cost Lists Variable Cost Startup Cost Ancillary Services Prices Regulated Prices etc.	Time Geographical Production Unit Type
<b>Electricity Measures:</b> Voltage (max, average, min) Power – Energy Calculation (MWh) Cosine Measure Active (A +/- ) Reactive (R +/- ) Capacitance (C +/- ) Inductance (I +/- )	Time Geographical Electricity Capacity (Voltage level) Electricity Absorption categories Electricity injection categories Customer Registry Production Unit Registry Production Unit Type
<b>Licensed energy quantity</b>	Time Participant
Losses	Electricity Injection categories Electricity Absorption categories
Production forecast (MWh)	Time Electricity Capacity (Voltage level) Electricity injection categories Geographical
Consumption forecast (MWh)	Time Electricity Capacity (Voltage level) Electricity Absorption categories Geographical
Budget (Comparison with actual expenses)	Time Geographical Industry Categories (Business segments) Investment projects Category of asset
Profitability	Time Geographical Industry Categories (Business segments)
Temperature	Time Geographical

Measures	Dimensions
Bills/Contracts No of Contracts/ Projects/ Funds Utilization No of Services	Time Industry Categories (Business segments) Geographical Electricity Absorption categories
Ancillary Services data Primary Control Reserve per unit per hour Secondary Control Reserve per unit per hour Voltage Control per unit per hour Part of dispatch period that NII SMO issued Dispatch Instruction for a Unit to remain non synchronized and standby for Tertiary Non-Spinning reserve provision Dispatch Instruction that a Unit shuts down The Energy injected into Black Start Service per unit per hour Energy produced by contracted unit u per hour	Time Production Units Registry Geographical

### 2.6.2 Analysis/Reporting

Indicative Reports per Subject Area are listed in the following Table:

**Table 2-3. MIS Reporting**

Financial	<ul style="list-style-type: none"> <li>• Revenue Actual vs. Target</li> <li>• Expenses Actual vs. Target</li> <li>• Project progress reports (Investment projects)</li> <li>• Cash flow need reports</li> <li>• Expenses report: per cost centre</li> <li>• Status of accounts</li> <li>• Forecasts</li> </ul>
Assets	<p>An interface with the MIS has to be implemented in order to transfer analysis results for reporting purposes, such as:</p> <ul style="list-style-type: none"> <li>• Methodical observation systems' troubles</li> <li>• Maintenance history</li> <li>• Maintenance process costs</li> <li>• Overhead Costing</li> </ul>
Market Operations	<ul style="list-style-type: none"> <li>• Electricity Consumption per hour for Industry categories or for specific industries, such as chemical industry.</li> <li>• The level of Electricity Production/Consumption/Demand of the country during the year. i.e. <ul style="list-style-type: none"> <li>○ Report of certain days or hours from previous year/s, that have similar characteristics, such as: <ul style="list-style-type: none"> <li>▪ The level of System Load</li> <li>▪ The temperature (i.e. offer previous days with Temperature higher than 40°C)</li> </ul> </li> <li>○ Report for measures higher than (max measures) or lower than (min measures) for a certain period of time (i.e. Top 10 figures).</li> </ul> </li> </ul>
Energy Operations	<ul style="list-style-type: none"> <li>• Equipment availability</li> <li>• Network availability per route</li> <li>• Variance Analysis</li> </ul>
HR	<p>Business Intelligence (Metrics, KPIs, Decision, Process)</p> <ul style="list-style-type: none"> <li>• Above Average Performer Yield Ratio</li> <li>• Absenteeism - Percentage of Employees</li> <li>• Absenteeism Combined Calculation</li> <li>• Absenteeism Rate Per Employee</li> <li>• Cost Per Hire</li> </ul>

	<ul style="list-style-type: none"> <li>• Full Time Equivalent (FTE) Calculation</li> <li>• Hire Yield Ratio</li> <li>• Interview Acceptance Yield Ratio</li> <li>• Interview Offer Yield Ratio</li> <li>• Job Offer Yield Ratio</li> <li>• Labour Costs as Percentage of Revenue</li> <li>• Profit Per Employee</li> <li>• Revenue Per Employee</li> <li>• Time To Fill</li> <li>• Total Health Care Costs Per Employee</li> <li>• Training Costs Per Employee</li> <li>• Turnover Calculation</li> <li>• Turnover Costs</li> <li>• Turnover Report</li> <li>• Vacancy Cost Calculation</li> <li>• Vacancy Rate Calculation</li> <li>• Workers' Compensation Costs Per Employee</li> </ul>
Executive Directors	<ul style="list-style-type: none"> <li>• Regulatory Reports (NII System Indicators, etc.)</li> <li>• System Status Reports per Units, Electricity Capacity (Voltage level), Power – Energy Calculation, Frequency</li> <li>• System Development per Projects/studies in progress, Project plans, High budget projects, Financial / Accounting data, Delays, Integration of units</li> <li>• Users' Requests from the Helpdesk. Analysis for Requests, Responses, Time and cost analysis</li> <li>• Market Status (Limit price, Supporting Service, Special tax, Bank returns / statements)</li> <li>• Market's Declarations (Participation, Type, Availability,)</li> <li>• Renewable Energy Sources (Applications/Requests, Response, Contracting, Forecasts)</li> </ul>
Production	<ul style="list-style-type: none"> <li>• Capacity per Production Type (Oil, RES, etc.)</li> <li>• Production per Production Type, Per Production Unit</li> </ul>

<p>Strategy Implementation &amp; Monitoring</p>	<p>Strategic Themes / Objectives Implementation and Monitoring:</p> <ul style="list-style-type: none"> <li>• Growth/Productivity</li> <li>• Decrease in operating cost</li> <li>• Become more efficient</li> <li>• Better management of the network</li> <li>• Performance Management</li> <li>• Decrease of System Malfunctions</li> </ul>
<p>RES evaluation indicators</p>	<p>KPI's Monitoring</p>
<p>Consumption (KWh)</p>	<ul style="list-style-type: none"> <li>• Demand</li> <li>• Peak (mainly in summer)</li> </ul>

## 2.7 Data Migration from Former Systems

The Contractor should migrate existing historical data provided by the NII SMO, up to 10 years back, as Initial Loading to the DW.

### 3 Helpdesk

#### 3.1 Scope and Business Goals of the Helpdesk

Helpdesk will act as a single point of service for responding to requests from all its “customer groups”.

The primary sources of requests relating to the Helpdesk functions can be classified in two main customer groups:

- “internal customers” where the primary requirement is the requests related to the internal procedures and activities;
- “outside customers” where the various actors, their roles and the respective organizational structure is presented in the following Table.

**Table 3-1.** Helpdesk-related Customer Group Definition

<b>Customer Group</b>	<b>Needs</b>
NII SMO Employees	Internal business processes, issues, incidents status, Quality of Service and activities related to the NII SMO.
PPC	Provide support for business issues Provide technical support for NII SMO provided services Manage both incoming and outgoing technical issues Support for H/R issues relating to PPC personnel working in NII SMO
Market Participants (excluding RES)	Provide support for business and regulatory issues Provide technical support for NII SMO provided services
RES Market Participants	Provide support for business and regulatory issues Provide technical support for NII SMO provided services
Ministry of Development	Support for regulatory issues Support for information requests
Customers	Power supply etc.
RAE	Support for regulatory issues Support for information requests
Prospect market participants	Support the contract processes Reply to requests for information
External providers (e.g., system vendors)	Inform providers about issues and track the related trouble-tickets Track SLAs
Others (e.g., media)	Reply to requests for information

The related types of request of the various Customers are presented in the following Table.

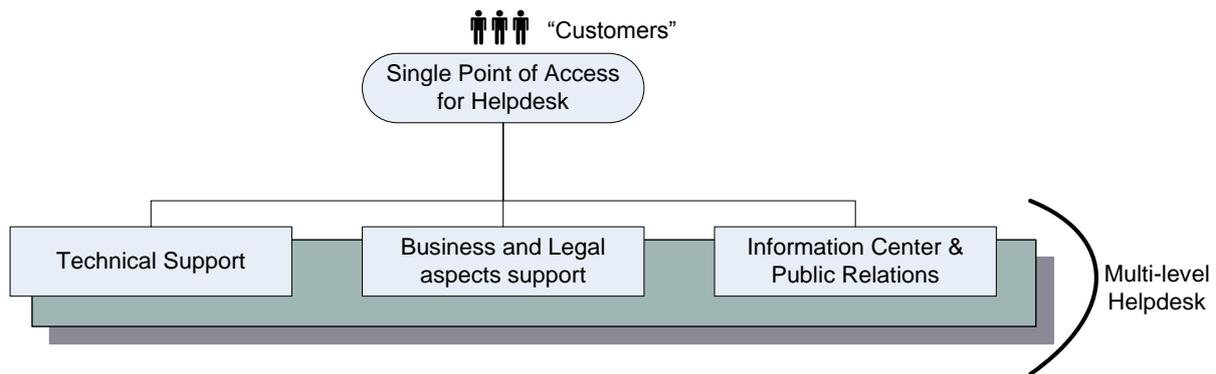
**Table 3-2. Types of Request**

<b>Request / Customer Types</b>	<b>Technical</b>	<b>Business</b>	<b>General Information / Public Relations</b>
NII SMO Employees	✓	✓	
PPC	✓	✓	✓
Market Participants	✓	✓	
Ministry of Development		✓	✓
RAE		✓	✓
Prospect market participants		✓	✓
Customers	✓	✓	
External providers	✓		
Others (e.g. media)		✓	✓

The NII SMO Helpdesk system should fulfill the following business goals:

- Establish repeatable, effective, and efficient processes by:
  - Enforcement of standards;
  - Automation of business processes;
  - Systematization of process execution through workflows.
- Quickly resolve business critical incidents and identifying root causes.
- Minimize business risk and required time to implement changes.
- Monitor and enforce SLAs both at technical and business level.
- Recording of interactions and activities for analysis and decision making.
- Capture business knowledge and best practices.
- Improved service level for both internal and external users.
- Accelerate learning curve for new employees / new positions minimizing the impact on their colleagues.

The following Figure depicts the envisaged multi-tier approach to Helpdesk.



**Figure 3-1.** Inception Diagram for the Multi-Tier of Support Based on the Type of Request

### 3.2 Helpdesk Objectives

The objectives of the Helpdesk are:

- The elaboration of the Implementation Plan and the Detailed Requirements Analysis.
- The design, implementation and configuration of a Helpdesk which will be installed in the premises of NII SMO for providing the desired functionality to the external and internal customer groups.
- The integration of the Helpdesk with the NII SMO Portal as well as the existing Call Center (PBX) environment.
- The validation of the correct functionality of the delivered Helpdesk system with respect to the defined Service Level Agreement (SLA) terms.
- The conformance to the international standards and recommendations that will be analyzed and defined in detail during the Detailed Design Phase.
- The training of the technical staff that will operate the Helpdesk, (administrator and operators) as well as training of selected NII SMO personnel to raise awareness for the benefits within the Organization, and the production of the appropriate Manuals.
- The consulting for facilitating the associated business models for the Helpdesk.

Based on these requirements and the detailed specifications contractor should implement a Helpdesk system able to meet the above goals, objectives and technical requirements.

### 3.3 Standardized Solution

Following the current internationally accepted trends on service provision and support, the proposed Helpdesk should follow the latest international world-wide de

facto standards, proven solutions and accepted procedures on service provision and support through Helpdesk Systems.

### **3.4 Helpdesk System Functional Requirements**

The minimum functional specifications of the Helpdesk should be as follows:

#### **3.4.1 Full Support of Incident Management (Trouble - Ticketing)**

Incident or ticketing management system is a fundamental functionality of the NII SMO Helpdesk. A trouble ticket (similar to case or incident or issue) must be used as a supporting mechanism for NII SMO to manage the initiation, classification, monitoring, reporting and resolution of any type of issue or problem reported by the above mentioned customer groups.

##### **3.4.1.1 Ticket Generation**

Tickets can be generated via e-mails, web based helpdesk interactions, forms or can be created on behalf of the customer in case of phone or fax by the Helpdesk agent. Each request is given a unique ticket number which will be the reference index for the specific request throughout its lifecycle.

##### **3.4.1.2 Ticketing Basic Functionality and Information**

At a minimum, the information that should be recorded once a request for support is made should include:

- Summary;
- Unique ID number;
- Issue type;
- Project: The system should provide the mechanism to bind any ticket to a project or “system” (e.g., Market System etc.) and support its transfer from one project to another;
- Sub-project or Work package ID;
- Job kind;
- Priority;
- Components affected;
- Planned resolution time;
- Remaining time estimate;
- Issuer Name;
- Name of the agent who assigns the ticket;
- Name of the agent to whom the ticket is assigned to;

- Department (if it deals with an internal support issue) or company name (if it is for external support);
- Contact information (phone number, e-mail address, fax number etc) or active link to account file;
- Description of technical problem (service request type) as a drop down menu (no free text);
- Environment or other important information (OS, Priority, dependency, history, etc.);
- Date and time of the request (automatically saved);
- Actual time from ticket open until ticket closure;
- Work time allocated to the ticket (automatically added as the sum of the total activities);
- Name of the supervisor who approves the resolution;
- Approval time;
- History of the ticket (activities like tasks, phone calls, appointments etc.);
- Comments field (free text).

The following features should be supported at a minimum:

- Provision of sufficient tickets amount;
- Configuration of suffix and prefix information of ticket (ticket ID)
- Each new request should be threaded in the ticket
- Ability to lock tickets;
- Ability to route, fix or close tickets (not only automated but also manually);
- Ability to reopen any closed ticket;
- Track ticket and customer history;
- Support for both push and pull mechanisms.

#### **3.4.1.3 Ticket Closure**

Once the issue is resolved, at least the following information should be recorded:

- Name of the employee who completed the work;
- Description of how the issue was resolved;
- Date of resolution;
- Amount of time allocated to resolving the issue (automatically added as the sum of the total activities).

#### **3.4.1.4 Ticket Assignment**

When the Helpdesk agents are creating a ticket they should have the ability to assign the issue internally to a specific employee. The assigned tickets can have a priority of Low, Medium or High. Specific “privileges” defines who may assign to whom (for a supervisor may be able to assign tickets to anyone, but a user will not be able to assign it to his colleague).

#### **3.4.1.5 Ticket Routing**

As a ticket moves through the system, it is usually classified as a certain type of issue, which in turn determines the skill set and expertise level of the agent(s) the ticket is assigned to. Until the issue is resolved, the "open ticket" for the problem remains in the work queue, with issues of highest priority taking precedence in terms of work flow.

The following functionality should be provided with respect to the routing of the Tickets:

- Automatically routed based on number of configurable rules managed by the administrators.
- Manually assigned and reassigned or transferred.
- Work items associated with a request should be able to be assigned or transferred to others, while maintaining the ownership of the request itself
- Manually created and routed from any screen

#### **3.4.1.6 “Customer” tailored functionality**

The NII SMO IT Helpdesk should provide the “Customer” (through portal) with the following functionality:

- Access security which should at least include the full parameterization of:
  - projects that they can access.
  - functions that are permitted to be performed on a fine-grained level (e.g. view, comment, assign, change status etc.)
- Generate and track tickets.
- Provide “self-help” capabilities.
- Support to attach files of any type to the issue. The file size limit should be defined by the administrator.
- Customers should be allowed to view responses for subjects that they have initiated or are related to their issue by the integration in the knowledge base. Internal information such as notes used for the resolution of an issue should not be visible to external customers).
- Ability to re-open or cancel tickets.

- Customers can specify Priority and Category of the tickets.
- Entire Customer History. Track all their previous tickets and their responses given by Helpdesk representatives.
- End users can browse and search the Knowledge Base depending upon their role and access privileges.

It has to be underlined that the full parameterization ability is mandatory for the provided Helpdesk, to ensure the flexibility to allow the whole system to evolve further, according to the NII SMO organizational processes, without the intervention or support of the Contractor.

#### **3.4.1.7 Internal Notes and Time Spent**

The tickets can have notes that are associated to them. More specifically, it is necessary to:

- Create notes for each ticket which are only visible to specific roles. Note must be entered as text supporting HTML and wiki-style formatting.
- Log the time spent for each ticket.

#### **3.4.1.8 Case and Status Tracking**

Tickets should be able to be tracked. The Helpdesk system should allow for the following minimum capabilities:

- Track the status of all tickets. Each ticket must be assigned a status that either changes manually or automatically after being triggered by another action or event within the system.
- Ability to restrict the available status selections depending upon the progress of the customer's request (e.g. a status can change from open to pending and pending to resolved but not from open to resolved) is required and should be user-friendly. The respective mechanism and logic that the application is employing must be described in detail.
- Tickets should have configurable statuses on a project level or on project type level, supported by respective workflows. An indicative scheme is the following:
  - Open: initial entry in the system.
  - Re-opened: issue was closed or resolved but is has re-appeared.
  - In-progress: the responsible entity has started working on the issue.
  - Resolved: the responsible entity has completed the work to fix the problem but the end user has not verified it.
  - Rejected: if the ticket is irrelevant to the subjects of NII SMO, or not applicable.

- Closed: issue was verified as fixed.

#### **3.4.1.9 Case History**

A history record should be present with the following minimum requirements:

- Keep an online record of all tickets.
- History must be saved on the case file and the “customer” file as well.
- Tracking and online view of the full audit history of changes in the ticket having as minimum required information the user that made the change, the timestamp and the old and new values of property changed.
- Keep as history all the activities that have been done (phone calls, appointments etc.
- Support of archive mechanism that the System Administrator can use in order to remove from the operational system tickets that are closed at least on the project (e.g. archive a whole project) and the closure date of the issue (e.g., archive all issues closed before YYYY-MM-DD).

#### **3.4.1.10 Sorting**

Each ticket may pass through multiple steps and follow specific workflows to be routed to the appropriate departments, etc.

The sorting of the tickets should be user configurable and include any of the standard fields of the ticket. System should support the option to save the user preferences in order to accelerate the process for repetitive tasks.

#### **3.4.1.11 Incident/Ticket Escalation**

Multi-level (multi-tier) support is required as a functional specification of the Helpdesk system. The first level of support should consider the incidents and requests that can be resolved by the first-line support personnel and the second level should involve the experts within the various business or organizational or technical units. The requests should be propagated throughout this sequence as long as they are not resolved and until their final resolution. Moreover, the escalation should involve the ability of informing the supervisors of the Helpdesk or the respective owners of the tickets as the deadline of the response is approaching. In cases, where a customer’s request cannot be answered by the NII SMO employees and the request must be escalated to a team leader or other departments, the system should provide the ability to automatically route the case based on defined workflow rules. Additionally, the system should provide the ability to exclude the NII SMO employees from workflows who are absent from the Helpdesk.

The Support of incident escalation should support at least the following features:

- Provision of SLA Management.
- Inbuilt Routing Engine.

- Tickets should be automatically escalated after a given deadline.
- Support of multiple escalation rules.
- Ability to create and customize workflows relating with ticket escalation.

#### **3.4.1.12 Collaboration on a Specific Ticket**

Collaboration between different NII SMO departments should be facilitated. A specific customer case may be resolved from the NII SMO employees or forwarded to a second level of support within the organization. This communication should be easy to carry out and every step should be tracked and recorded accordingly. The support of Service Level Agreements (SLAs) must be pinpointed by the vendor. Each customer Case may pass through multiple steps before final resolution and the progress or solution may be communicated to the customer.

Support for collaboration framework on a specific ticket:

- Support of private notes field with each ticket
- Ability to route ticket
- Multiple helpdesk operators should be able to work on the same tickets
- Ability to define any number of users that are related to the ticket and should receive all the relevant notifications.

#### **3.4.1.13 E-mail Integration**

Functionality regarding e-mails has to be fully configurable based on the user role and should include at least the following:

- Customers/ Operators should be able to initiate tickets via email;
- Mechanism to automatically insert emails as tickets;
- E-mail must be able to be inserted as ticket activity;
- Ability to distinguish the priority of the mails;
- Ability to assign default operators for various incidents;
- Support for auto-respond mechanism;
- Ability to associate category and project with incoming mails;
- Support multiple email notification rules that are fully customizable in enterprise, project and user levels;
- Support of mass production of personalized emails (mail merge).

#### **3.4.1.14 Multiple Interaction Channels**

Multi-channel support should be available, meaning that it should support the handling of incidents or requests independently of the channel of contact between NII SMO and the customer. These channels include but are not limited to telephone, email, fax or web. The customer experience and functionality provided by the system

should be the same independently of the channel used while a customer interaction may be initiated from one channel and completed through another, with the history of interaction to be kept along the process. Especially for tickets originated from the NII SMO Portal, these must be routed directly to the Helpdesk application and generate a case consistent with the one that was created manually by NII SMO employees. The origin of each case must be noted. NII SMO may determine that all cases be handled from a combined team of NII SMO employees or assign different groups to cases originated from a specific source.

#### **3.4.1.15 Reminders and Alerts**

The Helpdesk application must give the functionality of setting reminders and alerts. A reminder may be set not only by the agent himself but from supervisors as well or be part of an SLA. Furthermore, alerts must be able to be created through specific workflows, automatically. Supported channels for reminders and alerts should be: email and SMS (optional).

#### **3.4.1.16 Usability and Friendliness**

The purpose of the NII SMO employees is to solve as many customer requests as possible from the first contact with the customer. This process must be facilitated by providing a single view of all the customer information, summarized in a user friendly manner that can be easily comprehended. Moreover, the system should enable the viewing of all requests initiated by a Customer.

### **3.4.2 Full Support of Knowledge Management**

Knowledge Base (KB) is the defined collection of NII SMO's internal set of best practices, past issues or problems and their resolution, product and process data and any other information that can be used as a basis for analysis and training. It is organized into meaningful categories and provides access methods to query and report the elements of the knowledge base.

#### **3.4.2.1 Minimum Design Principles**

The KB should be integrated with the Helpdesk system and should support the following use cases:

- **Provide immediate answers to internal users** (support self-service pattern): Knowledge Base (KB) should empower all employees to have immediate access to all the information they need. They should instantly be able to find the answers they need, from a selection of powerful search methods.
- **Improve Support Staff Efficiency for the external “customers”**: Customer support staff should be able to search the knowledge base for answers, allowing them to reduce the time to answer customer questions.
- **Reduce Operational Cost through Self-Service**: KB should support the integration with the Portal and the parameterization of its access in order to support a secure and effective Self-Service mechanism.

The Helpdesk system should support at least the following features:

- **Structure:** KB module must support a multi-tier tree structure. Subjects may be based (but not limited) on NII SMO's departments. Also as a subject may be a specific group of articles that is related to a specific issue (i.e. printer problems). The possibility of addition and abstraction of a subject tree part by the administrators should be also considered as requirement.
- **Articles:** The basic unit of the KB's must be the article. An article contains information in a written text which gives solution to or provides information on a specific problem and belongs to a specific subject. The fields that characterize an article are:
  - Title, as a short description of the article;
  - Body, which is a free text field and is filled with the description of the specific problem;
  - Attachments. A tab where all common file types i.e. .pdf, .doc, .xls may be attached;
  - Keywords, which may be used from the user through the advanced search mechanism;
  - Also, any article should be able to be characterized from the administrators according to a classification field with respect to its accessibility (internal, public, restricted or not, etc.).
- **Search capabilities:** Easy search is essential for NII SMO users. The internal "customers" must be able to find the answer to their request easily in order to be more productive and solve their problems quickly. The agents that serve investors or other "customers" who did not find an answer through NII SMO Web page (on Frequently Asked Questions) must have an effective tool with advanced find capabilities. Search must be easily done using the title of an article or even some words that are part of the title. Furthermore, search must take place by using words which exists on the body of the article or by choosing a part of the subject tree. Greek language must be supported from the provided Knowledge Base search mechanisms and support for other languages must be specifically mentioned as well.
- **Approvals:** An article may be authored from any Helpdesk agent but must not be immediately published. On the contrary, supervisors (or administrators) must be alerted in order to check the proposed article and ensure that it really solves the specific problem and is compliant to any internal procedures and policies. After their approval, articles should be automatically published.
- **Access by the "customers":** Access to the KB should be through the NII SMO portal, and especially through a link that will direct the user, to the corresponding web page of KB. The KB should contain at least:

- Frequently Asked Questions (FAQs) and minimum the top 10 subjects that are asked more often.
- Subject tree. The user should be able to select the family of questions that are within his interest by using drill down techniques to search for more detailed subjects that belong in the particular sector of the subject tree.
- A search tool allowing the possibility to search articles with specific characteristics.
- KB should allow the registration of all external “customers” who wish to become users. Consequently, it should maintain their personal data in the database that it uses.
- Indicative data that will be maintained in the KB are (at least):
  - Support material for the various departments, such as handbooks, manuals, technical reports and white papers on past resolutions of concrete problems concerning hardware, software, telephone center etc.
  - Financial information, such as balance-sheets of NII SMO.
  - Documents, forms and processes that are required so that a potential “customer” enters the market of electric energy.
  - Corporate processes and directives to the employees

In case the material is not to be used by specific users (e.g., external customers), it should not be searchable and viewable by such users.

### **3.4.3 Support of Service Level/Contract Management**

NII SMO is going to provide specific level of support to its “customers”. The proposed SLA/Contract Management functionality should support fully at least the following processes:

- Manage lifecycle of SLA processes:
  - Define agreements
  - Collect performance data
  - Pinpoint problematic areas
  - Optimize processes
  - Categorization, routing, tracking, validation with the customer, and closing of all incidents on a per SLA dimension
  - Verifying compliance or deviation from the SLA terms.
- Automatic escalation of an incident priority based on its business risk or time waiting to be resolved.
- Allow to plan early for corrective actions before impact to business occurs.

**Table 3-3.** “Customers” needs vs. Helpdesk modules

<b>What is needed “Customers”</b>	<b>Issue / Incident Management</b>	<b>Knowledge Management</b>	<b>Service Level Management</b>
IT Department	✓	✓	✓
Candidate investors RES	✓	✓	✓
Producers RES	✓	✓	✓
European Commission	✓	✓	✓
Ministry of Development	✓	✓	✓
Participants in competitions / procurements	✓	✓	✓
Participants in the market (producers/suppliers)	✓	✓	✓
Local Authorities Org.	✓	✓	✓
All NII SMO Departments	✓	✓	✓

### **3.4.4 Business Processes – Analysis per Business Area (Modules)**

#### **3.4.4.1 Cross- NII SMO Business Areas**

The Helpdesk will be based on a cross-organizational business process aiming as service support module of the NII SMO infrastructure. In this context the process will involve the following steps:

The “customer” notifies the Helpdesk of his or her issue, and the Helpdesk issues a ticket that has details of the problem. If the Helpdesk operator is able to solve the issue, the ticket is closed and updated with documentation (update of the KB) of the solution to allow Helpdesk operators to reference. If the issue needs to be escalated, it will be dispatched to a second level for further processing. The second level will contain NII SMO personnel from various Divisions, specialized in the relative topic (e.g. Interpretation of Code, Legislation, Terms of connection, Energy elements balances etc., Clarifications on Uplifts, and others). Specific employees from every Division will be assigned this role (of being part of the Helpdesk process chain) and so these people will handle the ticket in the same way as the 1st Level Helpdesk operators.

#### **3.4.4.2 MIS/Reports Module**

The Helpdesk system should produce a broad set of reports that will have as data source all operational and business related data. However, generic and ad hoc reporting concerning the Helpdesk should be supported through the Corporate MIS environment. For this reason, the Helpdesk system should export to the MIS the appropriate information related to ticket supported by the Helpdesk system as will be defined during Detailed Design Phase.

### 3.4.4.3 Other Functional Specifications

The Helpdesk system should also provide the following functionality:

- Functionality on Customer Management;
- Ability to keep complete profile of the Customer;
- Management of Customers Address book (add, edit and delete users);
- SLA management for each user;
- Access Rights management and capabilities of imposing restrictions;
- Ability for Customer group management;
- Ability to maintain a log of all interactions across communications channels (web, email) against a contact;
- Ability to obtain contact activity history from the account or product topic.

#### Resource Scheduling

The Helpdesk system should allow for resource scheduling for the service rendering, with human resources and equipment. It should propose the user combinations of available resources based on specific date and hour, or other rules (such as "as soon as possible", "from... until"). Additionally, after the selection of the desirable planning, it should commit these resources, and inform their timetable not only in their Helpdesk working space but also through their email software.

#### Workflow capabilities

The platform should include workflow capabilities, as most of the tasks handled by the system are based on complex workflows, where the completion of one task may generate another, etc. The workflow capabilities should be described in detail, while reference must be made to the possible support of multiple workflows, support of complex approval or escalation paths (e.g. a case resolution may be approved by more than one supervisor, or escalated automatically if delayed more than x hours, etc).

The Helpdesk system should be able to map the ticket lifecycle to the specific business processes of NII SMO. The generic workflow of the ticket from "Open" status to the "Closed" (through the intermediate states) has to be able to be customized to reflect the individual needs of NII SMO. This means that individual workflows should be able to be defined based on organization departments, projects, or issue types, so as to allow each workflow to have as many and as different steps required, and under different conditions. The minimum requirements for granular process control should be:

- **Conditions:** In order to determine whether an issue can commence the transition from one step to the next (for instance if this step is permitted).
- **Validation Rules:** to validate and to ensure that any required fields are entered during the transition.

- **Post Functions:** these are automated events (e.g. email the project manager) triggered immediately after validation.
- **Ability:** to establish a link or association between tickets or requests where the link type can be customized. Indicative links are: “blocked-by”, “parent to child”, “relates to”, “duplicates” etc. Workflows should be aware of link information in order to support use cases like “if a “blocking” linked task is open then the parent task could not close”.
- Minimum parameters that should be supported in workflow rules are:
  - Project type;
  - Issue type;
  - Status;
  - Priority;
  - Employee Skills;
  - Employee Availability;
  - Employee Workload;
  - Requests by Category;
  - Requests by Department;
  - Requests by Site.

### **User-friendly Interface**

The vendor should depict the basic abilities and functionalities provided by the software application at the user’s desktop (personalization, language support, online help, locate support etc). Advanced features should also be described by the vendor.

### **Export of data to office applications or third party applications**

The Helpdesk system has to be able to export data in various formats that can be used by other applications. The Contractor should detail the types of the exported data (for instance XML). Additionally, the ability of restricting user access to such features should also be included (user rights to do exports or prohibit them, etc).

## **3.5 Technical Specifications**

### **3.5.1 General**

#### **3.5.1.1 Multi-Language – Greek Support**

The Helpdesk solution should provide multi-language support including at least Greek and English languages support.

### **3.5.1.2 Help Tool**

The Helpdesk system should provide an online Help tool which has to be at least in Greek and English language.

### **3.5.2 Security**

The Contractor must detail how the user permissions (e.g. limiting access to information, view specific fields or not, add/edit/delete information, changing views of data such as customer view, entity view) are controlled by the Helpdesk system and the level of expertise required (user, administrator, developer etc.). Focus must be given to the need for controlling the access rights to a specific entity (e.g. account, opportunity, etc) meaning that NII SMO may require for a user to have full access rights while another must not be able to view this information at all.

The security scheme and the User roles will be defined in full accordance to the Single Sign On approach that will be followed for the NII IT System. This implies compliance to the LDAP and support as far as it concerns the authentication of the users and their authorization on the system usage.

Moreover, the proposed solution must provide for the encryption of all authentication and authorization data that will be used.

The NII SMO's Helpdesk system must be able to do all the following:

- Ensure that sensitive data is protected against unauthorized access;
- Encrypt all data transferred between the user and the Web server using the industry-standard Secure Sockets Layer (SSL) encryption protocol;
- Full integration with Directory Services (LDAP);
- Support of Single-Sign-On and integration to NII SMO Portal;
- Assign Helpdesk users - personnel from various organizational departments, to cover specific questions/requests;
- Users and teams have different privileges according to their role. Administrators should be able to change these privileges easily through the use of profiles.

Especially, the functionality provided to the Helpdesk Administrator will include:

- Ability to add, edit and block Helpdesk operators;
- Configure Helpdesk operators groups based upon their rights;
- Assign different rights based upon the operators group.

The Security should be considered in the Organization level in a holistic manner:

- System level security, controlled by global permissions which will determine system wide privileges, such as who can administer or log into the Helpdesk.

- Project level security: Project permissions are very fine-grained and dictate who can see issues, create issues, edit issues, who can assign issues and others. Project permissions can be granted to: Individual users, Groups of users (e.g., customers, helpdesk staff, partners), Roles, (such as Director, Manager, Administrative secretary, or “Current Assignee”, “Anyone”, etc.). Projects can be associated to the Divisions and departments of NII SMO.
- Ticket level security: allowing the control and visibility over individual tickets. This is particularly beneficial in cases where the Helpdesk personnel can view all tickets (unresolved and resolved) whilst customers can view only their issues. This should involve also the field of comments where the visibility of individual comments can be restricted to certain groups.

### **3.5.3 Availability**

Since the Helpdesk system is deemed to play a significant role, it is a requirement that the solution should satisfy high availability (99%), 24 hours, 7 days per week. Additionally the Contractor should depict the variety of factors which could affect the availability of the system (backup, maintenance, patch, hot fixes or upgrade installations, etc.). Additionally, if the proposed architecture is multi-site, the Contractor should provide information regarding the capability to work offline (e.g. in case of a communication problem between NII SMO data center and Helpdesk) and the synchronization mechanism between the two sites.

### **3.5.4 Software Specifications**

#### **3.5.4.1 GUI**

The proposed solution should provide for usage of graphic environment for the interaction between users and system (GUI), which will help for efficient use of applications. For the Helpdesk operators who are not going to be attached on the Computer telephony integration (CTI), a Web based access through the Corporate Portal is required.

#### **3.5.4.2 Workflow Specifications**

With regard to monitoring the workflows the following tools shall be included in the proposed solution:

- Workflow business modeling environment. By providing the methodology and the tools for the workflow analysis.
- Workflow development environment. By providing the suitable tools for the simulation and layout of workflows, the distribution of work and determination of roles.
- Workflow runtime environment. By providing the working environment as well as the transparent communication between it and the database.

- Workflow administration and monitoring environment. By providing the environment for application management and configuration.

#### **3.5.4.3 Built-in Reporting Specifications**

The following report generation features should be supported by the NII SMO IT Helpdesk:

- Ability to generate reports by selecting various parameters;
- Several inbuilt reports;
- Capability of sending reports via emails;
- Inbuilt reporting engine;
- Ability to collaborate with other reporting tools;
- Ability to export reports to (at least) excel and .pdf formats;
- Generate graphs;
- Generate Dashboards (collections of reports in one screen).

The Helpdesk system will produce statistics on a periodic basis or on demand to monitor its activities. Reporting should cover both operational data (such as call lengths, ticket to call ratio) and business related data (such as effectiveness, business value and others). A set of reports should be possible to define a Dashboard view which offers an overview of key metrics from one screen.

Minimum set of provided reports should include the following:

- Response time to a ticket;
- Average time spent resolving a ticket;
- Number of breached tickets;
- Number of calls/tickets logged under various categories and subjects;
- Ticket to call ratio;
- Phone time variance = Timekeeping system total minutes / switch activity;
- Number of tickets received per day/week/month/year;
- Average of tickets/calls closed per day/week/month/year;
- Average of tickets/calls submitted per day/week/month/year;
- Average of tickets/calls resolved within SLA guidelines;
- Number and percentage of tickets/calls resolved within 24 hours;
- Total number of calls received during a specified time period;
- Average time an agent takes to pick up a call;
- Average time a user holds while waiting for an agent to answer;

- Percentage of users who end a call before reaching an agent;
- Percentage of calls during which the problem is resolved with no further call-back necessary;
- Various Pie Charts and Pivot reports;
- Recently created issues report;
- User Workload report;
- All pending tickets report.

There should be also the ability to create custom reports, apply filters and collaborate with legacy reporting tools. It should be able to compare these metric against the desired target ones and allow for optimization.

The contractor should provide the required services for an additional set of twenty (20) reports that will be defined during the Detailed Design Phase of the project and based on the exact requirements of the NII SMO personnel and specific customization of the software modules.

#### **3.5.4.4 Customization / Adaptation to New Requirements**

The system should be able to be easily customized and adapted to future requirements that will emerge either as far as it concerns its scalability but also to new functionality, processes and integration with future systems.

It is required that the basic customization of a form (e.g., to add or rename a field) should be performed through the application provided tools without the need of additional programming.

#### **3.5.4.5 SW Licenses**

The Contractor should provide the needed SW licenses to the Helpdesk personnel (administrators and operators) including the personnel of the key NII SMO Divisions that will participate in the 2nd level of support. A full Enterprise licensing scheme is required supporting both the internal personnel and external business parties (e.g. market participants etc).

#### **3.5.4.6 Business Private Branch Exchange**

The Helpdesk System should be supported by the NII SMO business telephone system PBX (private branch exchange). The Contractor should carefully study the technical specifications and capabilities and the status of the PBX, that is going to be installed in the SMO headquarters, in order to ensure that the Helpdesk solution can collaborate with this center. The additional hardware or software that may needed for the integration of the Helpdesk to the PBX should be provided by the Contractor.

The technical specifications, the capabilities of PBX and the respective sizing is to be provided to the Contractor during the Detailed Design Phase of the Project.

The Helpdesk system should be integrated with PBX to provide CTI (Computer Telephone Integration) services in order to facilitate the operations of the Helpdesk. Such integration includes but not limited to on screen transfer functionality, performing telephony operations from within the application (all basic functions) and automated customer recognition capabilities based on the Caller ID. The additional hardware or software that may needed for the integration of the helpdesk to the PBX should be provided by the NII SMO IT contractor.

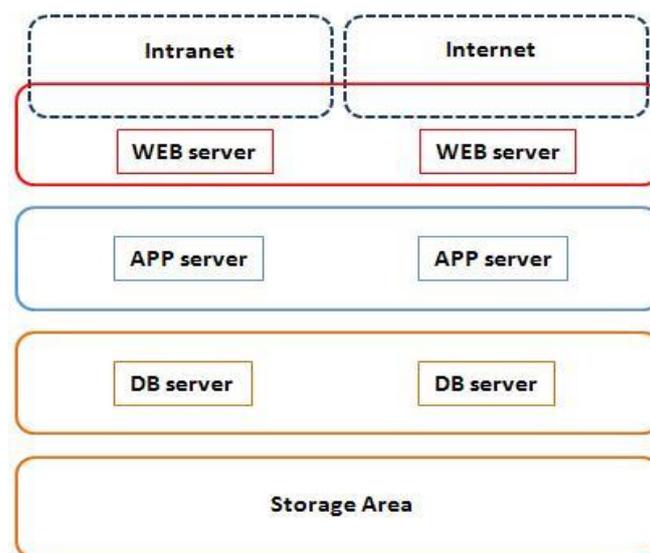
### 3.5.5 Helpdesk Integration to SMO’s IT System

The Helpdesk system must be integrated to the existing IT infrastructure of the NII SMO organization. Integration should be at both data and application level.

- Integration with the NII SMO Portal to provide access to the Helpdesk system through Web.
- Integration to DW to export to the corporate MIS information from the Helpdesk database , ticket related information or information for other entities supported by the Helpdesk system that will be defined during Detailed Design Phase.
- Integration to E-mail servers to manage and support communications through e-mails.

### 3.5.6 Helpdesk Infrastructure

The Helpdesk database should be hosted to a RAID (Redundant Array of Independent Disks) storage array. Archiving should be implemented with LTO library. The Helpdesk infrastructure overview is presented in the following Figure:



**Figure 3-2.** Helpdesk Infrastructure

### **3.5.7 Detailed Design & Dimensioning**

The potential concurrent users of the Helpdesk system are estimated to be 25. The Helpdesk should be capable to support up to 50 users or 50 calls per hour.