

**Schneider Electric DMS NS**

## **Company Profile**

**Commercial Documentation**

Table of Contents

1. SCHNEIDER ELECTRIC DMS NS (SEDMS)..... 1

    1.1. History..... 1

    1.2. Current Working Environment ..... 2

    1.3. Gartner Report..... 4

2. ADVANCED DISTRIBUTION MANAGEMENT SYSTEM ..... 6

3. ADMS REFERENCES..... 10

## 1. SCHNEIDER ELECTRIC DMS NS (SEDMS)

SEDMS is an unique and the biggest Research and Development center for Smart Grid solutions worldwide, hosting over 1000 top experts in Power and IT engineering, specially devoted to development and delivery of the Advanced Distribution Management Solutions (ADMS), which is including SCADA, DMS, EMS, OMS, PCS, Demand Side Management, AMI integrations, Distributed Generators Management and other smart grid solutions. Smart Grid IT business unit (SGIT) is the Competence Center for Schneider Electric worldwide, and it is located in the company “Schneider Electric DMS NS” in Novi Sad, Serbia (SEDMS).



*Figure 1-1 - SEDMS Company in Novi Sad*

### 1.1. History

SEDMS has a long tradition and experience in power engineering, and over 20 years in development, deployment and improvements of Smart Grid solutions. It was founded in 1995 by group of professors from the University of Novi Sad and was originally named ‘DMS Group’. Main focus of the company was development of the solution for the management of the distribution networks.

Due to the solution improvement and a growing number of clients, the ‘DMS Group’ had drawn the attention of the bigger companies and in 2008 made a joint venture with Spanish company, named Telvent. As a result, new generation of the integral SCADA/DMS system has been developed which represented complete system for the management of the distribution grids in the real time operation.

Finally, in 2012 a new joint venture was made with Schneider Electric, resulting in the 'Schneider Electric DMS NS'. In the last couple of years, a support from a growing number of clients and a vision of a Smart Grid solution lead to the expansion of the field of work of interest.

The growth of the personnel of ADMS Team in the past 20 years is presented in Figure 1-2. With opening of new ADMS projects, SEDMS expanded its team with new skilled associates. Such accelerated growth of the team, increasing in quality and quantity was possible since Schneider Electric DMS NS remains among companies constituting Science and Technology Park of University of Novi Sad, Faculty of Technical Sciences.

## Growth of DMS Team

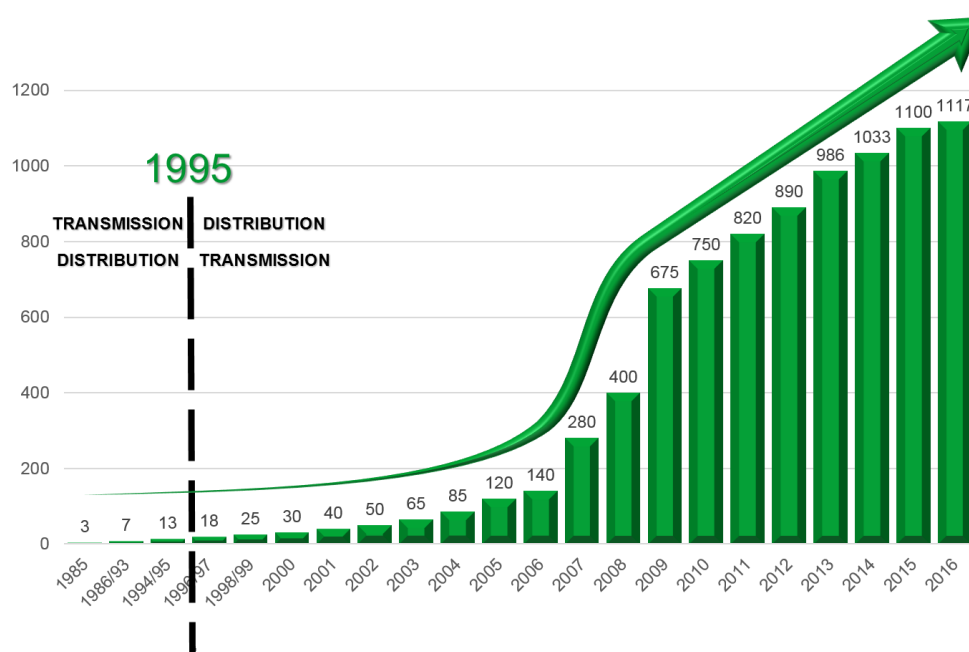


Figure 1-2 - Growth of DMS Team

## 1.2. Current Working Environment

Nowadays, the scope of work is not only focused on the SCADA and DMS, but also on OMS (Outage Management Module), EMS (Energy (Transmission) Management Module), DRM (Demand Response Management Module) and PCS (Power Control Management Module) thus resulting in a fully integrated, complete solution for power management for utilities, named as Advanced Distribution Management System (ADMS).

Large part of R&D resources in SEDMS is formed from engineers coming from the University. Faculty of Technical Sciences – University of Novi Sad counts about 12.000

students. There are four departments: Power Engineering, Software Engineering, Computer Sciences and Chair for Systems and Automation. These teams support SEDMS in R&D for software for control centers and integration with 3rd party solutions. Working environment of SEDMS is presented in Figure below.

## Environment of Schneider Electric DMS NS

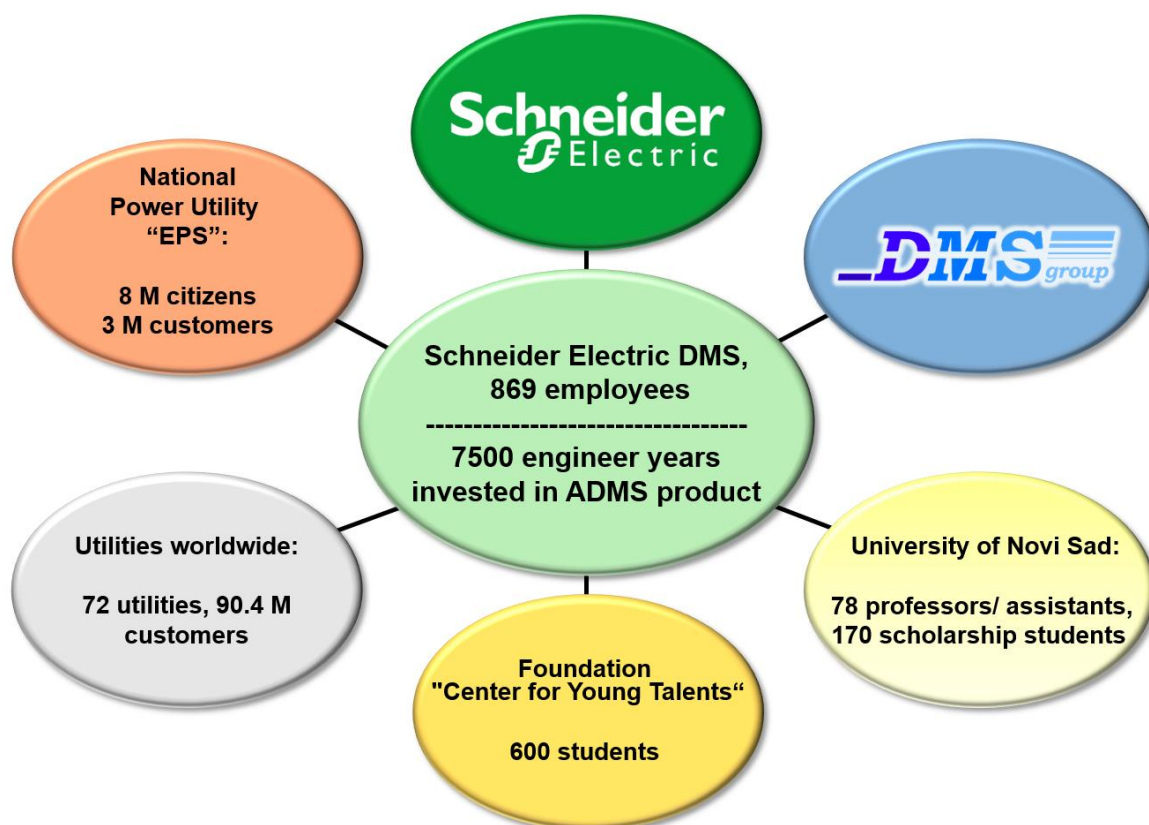


Figure 1-3 - Working Environment

The software development team is the biggest team of its kind in the world and counts approx. 1000 outstanding experienced power and software engineers (among them 31 PhDs) which are employed in development of power engineering application software. Expert resources of SEDMS, besides exceptional qualification, motivation and working discipline also have a very competitive price. The company has invested 7500 eng/months into the product, starting from year 1995. SEDMS personnel profile is presented in Figure below.

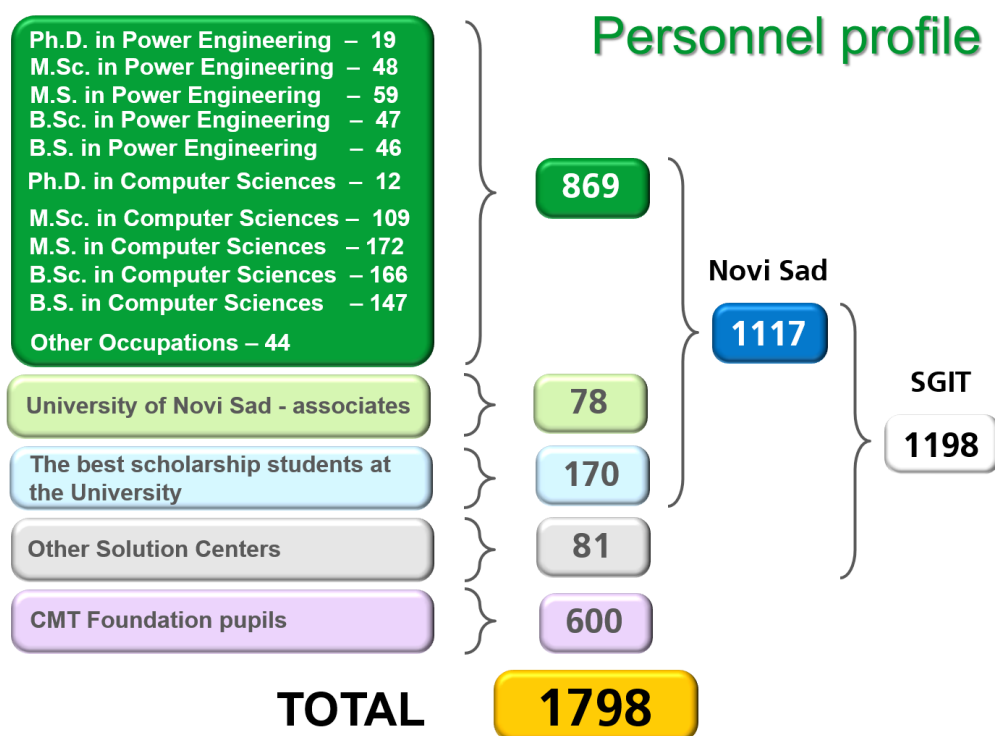


Figure 1-4 - Personnel profile

### 1.3. Gartner Report

Gartner reports, including the Gartner Magic Quadrant, are regarded industry-wide as the authoritative source for competitive comparisons in the information technology industry. Magic Quadrant reports offer in-depth analyses and visual summaries of the direction and maturity of markets and key vendors.

Schneider Electric, based on SEDMS ADMS is positioned as the leader in Gartner Magic Quadrant for Advanced Distribution System for three consecutive years (2012-2016).

ADMS has been recognized in both the Magic Quadrant and the new Critical Capability reports, which reinforces SEDMS strong position to help utility customers run more efficient and smarter operations.



Figure 1-5 – Gartner Report 2016

## 2. ADVANCED DISTRIBUTION MANAGEMENT SYSTEM

ADMS stands for 'Advanced Distribution Management System' and it presents a fully integrated smart network control system for Utilities consisted of:

- PCS (Power Control Module) – management of the generation, economic dispatching, automatic generation control and forecast of the production.
- EMS (Energy Management Module) – management of the transmission network, control, monitoring and analysis of the transmission network operation
- SCADA (Supervisory Control and Data Acquisition) – module provides the remote control to the automated field devices and data acquisition
- DMS (Distribution Management System Module) – management of the distribution grids, module for power network analysis, smart operation, optimization and planning
- OMS (Outage Management Module) – management of power outages (incidents or scheduled works) based on trouble calls, AMI, field devices, with smart operation, web field clients, advanced reporting of outages and KPI ...
- DRM (Demand Response Management Module) – smart management of the consumption, optimization and scheduling of demand response resources

which provides tools for advanced operation, monitoring and control of distribution network control of distribution networks, operation analysis, optimization, improvement, maintenance and long-term planning ADMS is an efficient and optimal solution for electric utility employees, performing from the simplest operating tasks to the most advanced engineering.

Key advantages of ADMS solution:

- **Integration** and synergy of five modules using one Database and one User Interface. Traditionally, PCS, EMS, SCADA, DMS, OMS and DRM were separate entities with separate network models and separate user interfaces. Using five systems was complicated and inefficient, because of different user interfaces, data redundancy and data migration between systems. SEDMS has integrated these five systems into one unique solution, ADMS, integrating all data models for operation, operation planning, development planning, simulation and analysis; in other words, it means a complete synchronization among used models. Only in this way, it was possible to establish the "single source of truth".
- **Unique, highly secure system** based on the highest North American cyber security standards (NERC CIP), reliable and scalable system - SEDMS recognizes security as a critical cornerstone in product development and will continue to invest in maintaining



high standards when it comes to cyber security including independent testing and verification at government and non-government institutions such as Idaho National Laboratories

- **Forward-thinking Product Architecture** (Figure 2-1): well-designed and integrated Smart Grid solution considers the complexities of architecture, current and future integrating technologies, as well as planned and legacy systems.
- **Reliability:** Replication model and system architecture allows customers to configure and run their critical infrastructure in the configuration that best suits their individual business needs.
- **Integration:** Rich set of integration options including standard based APIs (CIM data model, web services, SQL), ability to extend data model, large catalog of already developed adapters and rich experience in various integration scenarios.
- **Uniformity:** Unique symbols, user interface, single line/geographical displays accompanied with street map and extremely rich and efficient HMI; network display on tablets.
- **Ease to Use:** Complete, integrated system that lets utility leaders and operators analyses the optimal use of assets in near-real time. The integrated solution provides optimal access to data and leads to improved customer service.
- **Comprehensive set of power applications:** DMS Analytical Applications System is the "intelligence" of ADMS. This system is a full and comprehensive set of sophisticated software and algorithms that enable the most efficient design, optimal operation and decision making referring to the whole equipment installed in the distribution network. DMS Analytical Applications System enables performing of practically all technical tasks in Distribution Utilities.

Only integrated system brings business value !

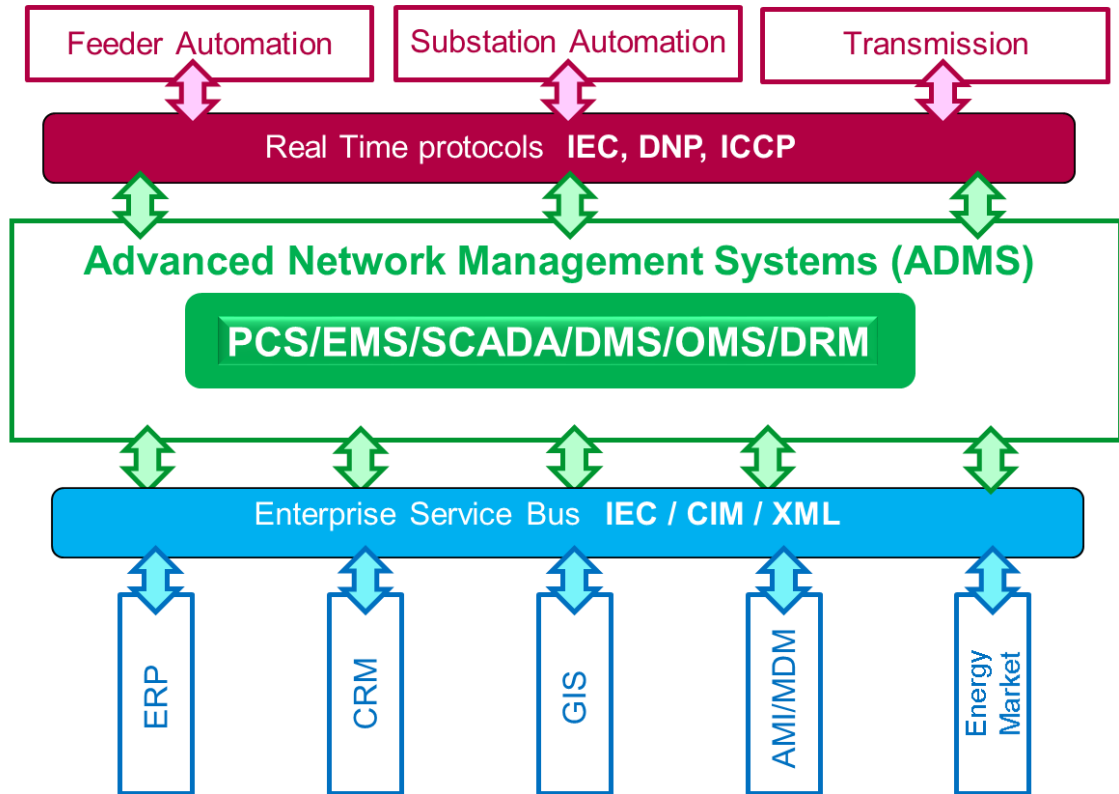


Figure 2-1 - High Level Architecture of ADMS

ADMS system offers over 50 power functions, which currently presents the richest Smart Grid function list in the world. The functions are divided in four groups according to their purposes:

1. Core (run in the background of any calculation)
2. Network operation (functions which support quick and efficient management of the network in real time)
3. Operation Planning and Optimization (functions for analysis of future state and optimization of the current network state)
4. DMS Network Analysis (analysis of the network operation in terms of quality, losses, equipment operation, etc.)
5. DMS Network Planning (functions for the long term network development and reinforcement in the most efficient way).

The total list of functions is presented in the Figure 2-2.

Finally, the most important benefits acquired by using the ADMS solution to the utilities are listed below:

- Improved Safety and Reliability of the Network operation,
- Reduced Peak Demand and Power (System) Losses,
- Reduced Outage Time for Customers,
- Improved Performance Indices (regulatory KPIs) ,
- Improved Utilization of Network facilities – reduced Investments,
- Improved Power Quality,
- Improved Customer Services.

Using of SE ADMS software without a doubt increases the income of the utility and as an added value – improves customer satisfaction.

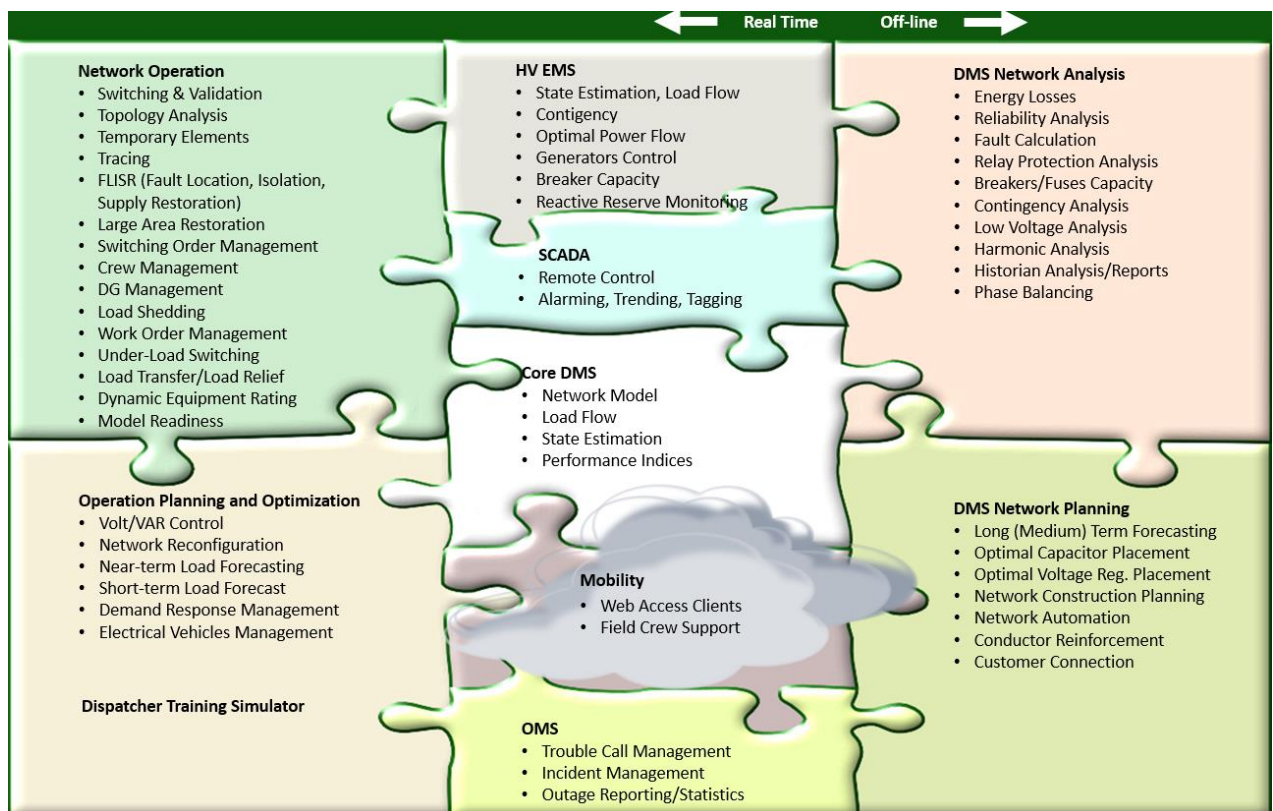
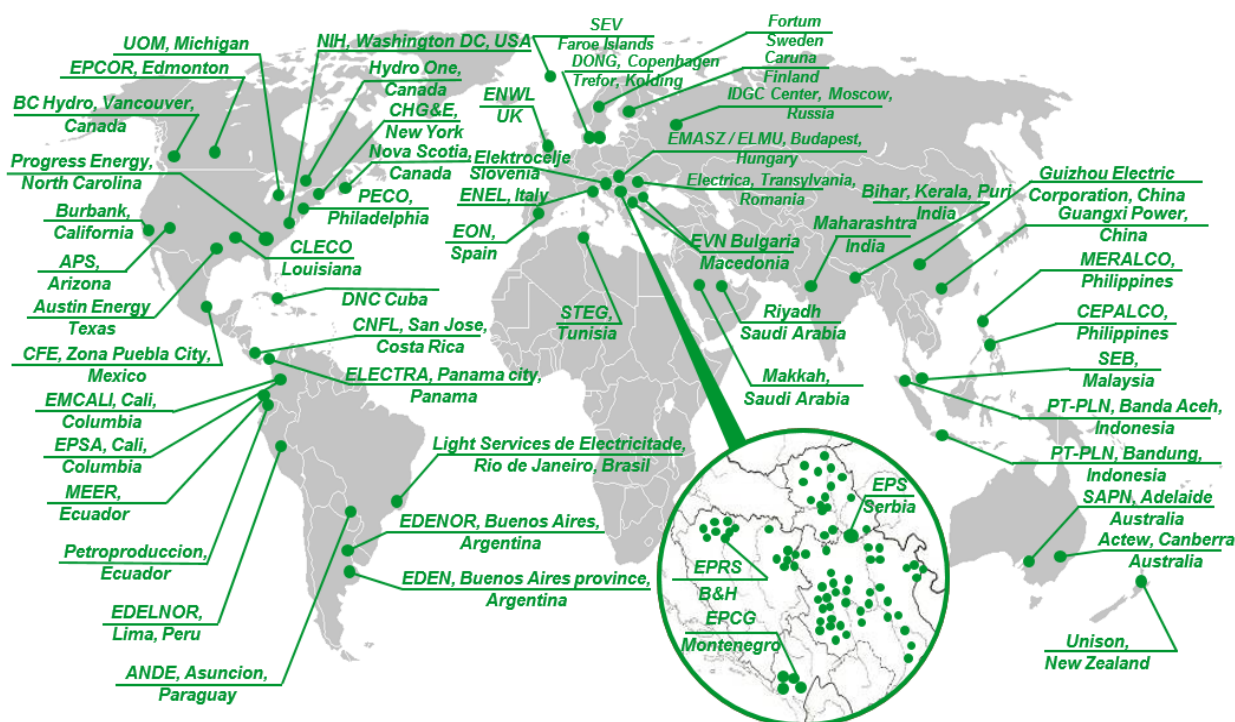


Figure 2-2- ADMS Function List

### 3. ADMS REFERENCES

Currently, SE ADMS is implemented in 73 utilities worldwide, in 157 control centres, covering 90.9 million consumers. All references are presented in the Figure 3-1.



**73 Utilities, 90.9 millions electrical consumers, 157 Control Centers**

Figure 3-1 - SE ADMS References

References of some of the bigger projects are listed below:

#### 1. DUKE/PROGRESS ENERGY, North Carolina, USA



The utility covers 1.5 million customers, the SE ADMS has implemented SCADA/DMS solution with a Distribution Side Demand Response system which managed to reduce the peak demand load by 200 MW.

#### 2. HYDRO ONE, Toronto, Ontario, Canada



The utility covers 1.3 million customers, the SE ADMS has implemented SCADA/DMS solution with control and management of the distribution generators in the network as well.

3. **AUSTIN ENERGY**, Austin, Texas, USA



The utility covers 500 000 customers, the SE ADMS has implemented SCADA/DMS/OMS solution, which has successfully gone into production in 2014 and currently is in charge of management of all outages in the system.

4. **ENEL**, Power Industry of Italy



The utility covers 33 million customers, the SE ADMS has implemented DMS solution integrated with already installed SCADA system. The system is now operating in 28 control centres in Italy.

5. **DONG ENERGY**, Copenhagen, Denmark



The utility covers 1.1 million customers, the SE ADMS has implemented SCADA/DMS solution responsible for network management and control, fault management and service restoration.

6. **GUIZHOU ELECTRIC CORP**, China



The utility supplies the area of 50 million people, the SE ADMS has implemented a pilot project for SCADA/DMS solution responsible for network management and control.

7. **PECO Energy**, Philadelphia, USA



The utility covers 1.6 million customers, the SE ADMS has implemented SCADA/DMS solution, which has successfully gone into production in 2015.

8. **ELLEVIO ex Fortum**, Karlstad, Sweden



This is a regulated electricity distribution utility serving 910 000 electrical customers, the SE ADMS has implemented SCADA/DMS/OMS solution, which has successfully gone into production in 2015.



