

EXPERIENCE WITH PROCESS OF UNBUNDLING IN SLOVENIAN ELECTRIC DISTRIBUTION COMPANIES AND IMPACT ON INFORMATION SYSTEM

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INTRODUCTION

Electric distribution system in Slovenia underwent major organizational changes in recent years because of the electricity market liberalization and due to fulfillment of the requirements of European directives. In this paper we will present main steps of the reorganization. Consequences of market liberalization are already visible through increasing number of customers switching electricity suppliers in last two years. Organizational change had also significant impact on the formerly unified information system. The most extensive and significant changes in information system were made in billing system and customer relationship management. A lot of new functionality was implemented for information support of data exchange between all market participants.

In this paper we will focus on previously unified billing system that was divided in two independent billing systems, one for grid operator and other for electricity supplier.

REORGANIZATION OF THE ELECTRIC DISTRIBUTION SYSTEM AND OPEN MARKET OPERATION

Liberalization of EU electricity market and adoption of EU directives and consequently local legislation changes had major impact on organizational scheme of Slovenian electric distribution companies.

As a result new subsidiaries of distribution companies were founded and also new electrical supplier companies were established. The formation of new companies had major impact on electrical market operation.

Organization of electrical distribution companies before market liberalization

In 1990, so called labor organizations were transformed into state owned enterprises. In October 1990 the Executive Council of the Republic of Slovenia adopted the Decree for establishment of state owned company for electric power transmission Elektro Slovenija (ELES) and five state owned

electrical distribution companies (Official Journal republic of Slovenia, Number 38/90): Elektro Celje, p.o., Elektro Gorenjska, p. o., Elektro Ljubljana, p. o., Elektro Maribor, p. o. in Elektro Primorska, p. o., that started operating as public companies on the first of January 1991. In 1993 adopted Law for public utility services with its provisions interfered in organization and activities conducted in public companies. According to this law all infrastructure was nationalized. Infrastructure has been identified only in 1994. State share was defined also in the rest of capital in energy companies. After declaring independence and the emergence of the state of Slovenia, privatization of distribution companies in accordance with the Law on Ownership Transformation of state Companies (Official Journal republic of Slovenia 101/1999) was carried out in 1997 and 1998. Process transformed enterprises in joint-stock companies (1 Hrovatin).

At the end of year 2000, following the decision of the Business Interest Group of electrical distribution companies in Slovenia, organizational scheme changed from regional to functional scheme. Functional scheme was separated in public utility services (distribution service, management and supply of electricity to households), electric market services, nonelectric market services (construction and maintenance) and common corporate services. For all types of services separated financial statements were established.

In year 2005 distribution companies organized as a single corporate legal entity that provides services in separated organizational units (Hrovatin 1). Figure 1 shows the regional coverage of electric distribution companies in Slovenia.

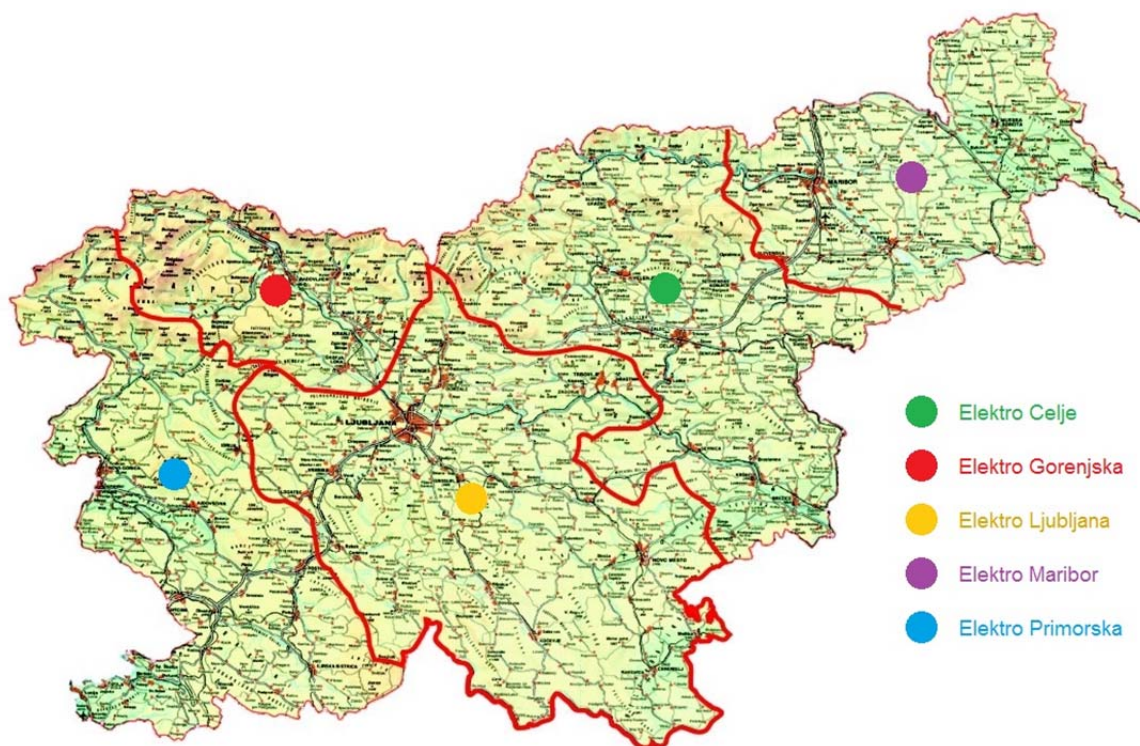


Figure 1 - regional coverage of electric distribution companies in Slovenia.

Market Liberalization

Opening of the electricity market in 2007 marked a new milestone for the Slovenian electrical distribution. Distribution system operator services were separated from other services, which meant yet another reorganization of the electricity distribution system in Slovenia.

In accordance with EU Directive 96/92 ES and Energy Act (Official Journal republic of Slovenia, Number 79/99 and 8/2000) foundation for market opening in Slovenia was set up. First step towards market opening was made on 15th April 2001. At that time, the biggest consumers, who spend a total of seven billion KWh of electricity per year, could select their electricity supplier. Overall this meant that in terms of electricity consumed 65 percent of electricity market was open. First day of January 2003 state border for electricity market was open for eligible consumers. In accordance with amendments in Energy Act in May 2004 and in line with European legislation the opening of electricity markets was accelerated (Papler 2). On the basis of Article 80 and 87 of the Energy Act amendments (Official Journal republic of Slovenia, Number 51/04) at 1 July 2007, all consumers could freely choose their supplier. At this time Slovenian electricity market was fully opened. In process of electricity market liberalization several participants were involved. Directorate of Energy was responsible for preparation and establishment of the conditions for the implementation of legal unbundling in electric distribution companies. Directorate of Energy first revised regulation regarding electric distribution system and market opening.

Then, the government with help of ministry of finance and ministry of law adopted a decision on how to reorganize the electric distribution system. This was the basis for issuing concession. The concession agreement between the government and the company SODO, d.o.o. that was new electric distribution system operator in Slovenia was signed. At the same time also lease contract for electric distribution network between SODO, d.o.o. and distribution companies was signed.

In the preparation of all acts electric distribution companies were involved, mainly in the form of assistance in preparing the rules and general content of lease contract with electric distribution system operator (SODO, d.o.o.) (Janjic 3). Company SODO, d. o. o. was licensed to practice public services of an electrical energy distribution system operator. The license was issued by the Public Agency of the Republic of Slovenia for energy after 6th Article of the Energy Law, the number 0686-08-015/002/07, dated 8.6.2007.

In the second step, which was carried out at the end of year 2011, electric distribution companies legally separated their sales services and network maintenance services. Sales services were transferred in subsidiaries:

- E 3, d.o.o. (subsidiary of Elektro Primorska, d.d.),
- Elektro Celje Energija, d.o.o. (subsidiary of Elektro Celje, d.d.),
- Elektro Energija, d.o.o. (subsidiary of Elektro Ljubljana),
- Elektro Gorenjska Prodaja, d.o.o. (subsidiary of Elektro Gorenjska, d.d.),
- Elektro Maribor Energija Plus, d.o.o. (subsidiary of Elektro Maribor, d.d.),

In Slovenia no particular problems were observed when the electricity market was opened. Processes carried out were similar to those in other European countries. In certain segments Slovenia had advantage, since the separation of electricity companies in transmission, distribution and production was already in place. Slovenia also did not have any vertically integrated companies in this area (Janjic 4).

Current organizational scheme of electric distribution system

In 2007, the responsibility to manage, operate and maintain the distribution network was transferred from 5 regional electricity distribution companies in mixed ownership to one state-owned distribution system operator SODO, d.o.o.. However, the transferal of this regulated operation was carried out without the transferal of ownership of the distribution network from 5 regional electric distribution companies to the mentioned state-owned distribution system operator. As the company SODO, d.o.o. does not own distribution network, nor has adequate staff resources for carrying out of public services of maintaining and managing distribution network, the lease contract with distribution network owners was signed. The contract among other defines also services that are performed by distribution network owners for SODO, d.o.o..

Distribution network owners in Slovenia are:

- Elektro Celje, d. d.,
- Elektro Gorenjska, d. d.,
- Elektro Ljubljana, d. d.,
- Elektro Maribor, d. d.,
- Elektro Primorska, d. d.

On the basis of the contracts, the above companies provide services for SODO, d. o. o., using their own infrastructure. The distribution networks include electric power lines and facilities for low voltage (0.4 kV), medium voltage (10, 20, and 35 kV), and in some cases also for high voltage (110kV).

In the field of retail market there are in Slovenia currently 8 suppliers of electricity for industry and households customers:

- E 3, d.o.o.,
- Elektro Celje Energija, d.o.o.,
- Elektro Energija, d.o.o.,
- Elektro Gorenjska Prodaja, d.o.o.,
- Elektro Maribor Energija Plus, d.o.o.,
- GEN-I, d.o.o.
- Petrol Energetika, d.o.o.,
- Petrol, d.d.

Functioning of the electricity market in Slovenia

All business customers can freely choose their supplier from 1.7.2004. Household consumers can choose their supplier of electricity from 1.7.2007. At the opening of the market for households there were five electric distribution companies that supplied electricity for households with same prices till end of year 2007. From year 2008 market became more dynamic with entry of new suppliers. At the end of 2011 in Slovenia were eight suppliers that offered to household customers 34 different energy supply packages or bundles. Awareness among consumers about their rights and possibilities is growing. Suppliers have clear marketing strategies and seek to achieve the increased market share in the electricity market. This means an increasing number of different offers, campaigns and other marketing practices that greatly expand choice, as well as price differences become large enough to encourage switching.

In Slovenian electricity retail market there have been 33,518 switches of electricity suppliers in year 2011. In year 2010 there were 17,780 customers that switched the supplier. Table 1 shows the growth or decline in market shares of electricity suppliers between 2010 and 2011.

TABLE 1 – Market shares of electricity suppliers (Corti 5)

Supplier	Quantity of electricity energy in 2011 (Kwh)	Market share in 2011	Market share in 2010	Index 2011/2010
Elektro Ljubljana, d.d. (subsidiary Elektro energija, d.o.o.)	2.743.511.843	25,9%	28,9%	-3,0%
GEN-I, d.o.o	2.443.703.056	23,1%	19,6%	3,5%
Elektro Maribor, d.d. (subsidiary Elektro Maribor Energija Plus, d.o.o)	1.597.840.198	15,1%	16,8%	-1,7%
Elektro Celje, d.d. (subsidiary Elektro Celje Energija, d.o.o.)	1.472.985.082	13,9%	12,6%	1,3%
Elektro Primorska, d.d. (subsidiary E3, d.o.o.)	1.187.743.597	11,2%	11,5%	-0,3%

Elektro Gorenjska, d.d. (subsidiary Elektro Gorenjska prodaja, d.o.o.)	787.963.614	7,5%	9,4%	1,9%
Other	340.718.804	3,2%	1,2%	2,0%
Skupaj	10.574.466.194	100,0%	100,0%	

Highest market share has Elektro Energija, d.o.o, which was last year 25.9% or 3% less than in year 2010. Following in second place, GEN-I, last year increased market share by 3.5%. Elektro Maribor Energy Plus follows with market share decreased by 1.7%. Elektro Celje Energija market share grew by 1.3%, while the E3, d.o.o. market share declined by 0.3% in comparison to year 2010. Elektro Gorenjska prodaja lost 1.9% market share in the last year. Others (mostly Petrol) grew by 2%. On retail market two new market players (GEN-I and Petrol) appeared with over 25% of market share. The data shows that the market is open and market shares are changing. It will be very interesting to monitor the trends of switching suppliers in the coming years. Changes in market share will certainly happen.

IT SUPPORT IN SLOVENIA ELECTRIC DISTRIBUTION SYSTEM IN CONDITIONS OF THE ELECTRICITY MARKET OPENING

The majority of information services for the Slovenian electricity distribution companies are carried out by company Informatika, d.d., with the savings achieved because the support for all five companies is shared. It should be noted that the electric distribution companies are majority owner of Informatika, d.d., which means that they have ownership control over one of its key subcontractors.

Informatika's IT solutions cover following areas:

- In house developed billing system
- Support the process of managing customer in its lifecycle from connection to the network and till the disconnection
- Central database of all technical assets in Slovenia electro distribution system including measurement points
- In-house developed financial and other applications (General ledger, salary, Invoicing etc.)
- In-house developed data warehouse applications
- Support for data exchange between all market participants
- Printing and archiving Invoices

IT solutions are constantly upgraded in order to support process changes regarding market opening. When market opened, once shared and common IT support is not so uniform anymore. The first changes have been implemented in applications supporting customer relationship management, which are no longer centralized but already different from company to company. Only interfaces for managing the supply contracts remain centralized and unified because this is crucial input for billing system.

Many changes have been made in billing system and billing related subsystems in order to support all business changes regarding market opening. Many adjustments and new functionality was required to implement application solutions for the data exchange between all market participants like internal suppliers, external suppliers, distribution system operator, Energy Agency, market operator, etc. With the implementation of legal and functional unbundling of distribution operator services and supply services also unbundling in once central billing was necessary. The unbundling in billing system will be performed in two steps. The first step, that already took place, was the separation made in the existing billing system. In the second step, which is still ongoing is development of new billing system, which takes into account all new legal and market rules.

MODERNIZATION OF THE BILLING SYSTEM

The main objectives of the modernization or redevelopment of the billing system are:

- Meeting the requirement of a consistent unbundling of distribution operator's and supplier's business processes
- Provide a modern information system developed in the latest technologies
- Incorporation of new requirements and business concepts in the information system – mainly to promote the increase of competitiveness of the suppliers

Consistent unbundling of the information system

Before the unbundling, the Slovenian electricity distribution companies had a joint information system, which covered the company's business processes. The main role in the system was played by the massive accounting and billing system for electricity. In the process of unbundling, the billing system had to split in to two new systems – while the distribution operator's part had no specifics (is identical for all operators in Slovenia) the supplier's part had to be specific for every company. With this purpose, the billing system was developed as a common platform with certain specifics covering each single supplier – these are met by defining proper business rules for each company.

The two systems are functionally independent, meaning; they exchange only data using web services. Because the supplier companies took over the user support operations (call center and other customer services) for the distribution operators, the operator's billing system enables the supplier's system to invoke certain operations from the operator's billing system.

The legal unbundling requirements led to the requirements on the technical level, prescribing the methodology for data exchange between the operator and the supplier. For the most part, data about network consumption is sent from the operator to the supplier, meaning the amount and quantity that is charged by the operator to the consumer. This information consists of:

- Consumption on the metering point – meter reading details and technical properties
- Charged network usage - this will be charged on the supplier's bill to the consumer

From Technical point of view, the data exchange methodology is fulfilling the tendency to use XML technologies. For this purpose, based also on the ebIX recommendations, an XML document format for exchanging data about charged network usages was prescribed (named "priloga A XML") and has to be supported by all the parties appearing on the market in Slovenia.

By implementing the new billing system and its related systems (CRM, ERP, etc.), the goal of complete automation of data exchange between operators and suppliers, which in many cases even today is done manually (data is in non-structured forms available on several different portals), wants to be achieved.

Modern information system developed in the latest technologies

The history of the development of the existing billing information system is quite long and because it did not adapt to the advance in technology, the main part of the business applications is still working in a terminal environment. The responsiveness of these applications is of course very fast, since the programs are not so extensive as for instance fat clients or web applications, but the user experience in general differs a lot compared to web applications displaying different kinds of data and with the ability of selectively hiding/displaying the wanted data – thus allowing to display a much larger amount of data at once, compared to the now used "32x70" terminal window.

Besides the lack in user experience, one of the biggest weaknesses of the current information system, is the limited possibility of integration with other systems (e.g. web applications, CRM system, etc.). Integration is only possible with data – direct access to database tables or in the best cases calls of stored procedures, which insert or update the data, without any knowledge by the application that generally manages this data.

The new billing system is developed according to SOA methodology and with the use of the IBM Portal as a platform for the user interface. This allows a weak dependency between single segments of the information system and the usage of web user interfaces, which allow a centralized deployment and maintenance of the applications. Because the end user uses a web browser to access the billing system, the user is already acquainted with the “look and feel” of the user interface reminding him of other web sites and also, there is no need for maintenance on the end user’s PC.

The improved user interface and the advancement of the users, allow the possibility to give a better overview to the end user, regarding the performances of the billing system, batch jobs results, data previews, notifications about warnings or errors, etc. All this enables a better insight and control over the billing process results and increases the confidence of the end users towards the billing system. In the current billing system, the confidence was based on “tradition” and was gained over a long period of time, by eliminating the flaws, one by one.

A very important improvement in the new billing system is the possibility of better and more flexible integrations with other information systems, for instance CRM or ERP systems. Because of the variety of the areas on which our customers are operating (from technical infrastructure maintenance to electricity trading) and also because the heterogeneousness of their strategies, many peripheral solutions by different providers are already in use. As mentioned before, nowadays these solutions are integrated on the data level, thus implying a very strong dependency between different applications. By the use of integration with web services, only an outer protocol has to be defined, without such a strong (or any) impact to the inside of the applications. Besides the ease of maintenance of these applications, also the wideness of possibilities for integration of these applications is a significant advantage.

Incorporation of new requirements and business concepts

The development of the current billing system began more than 30 years ago in a “pioneer” way and since then, did not experience fundamental, revolutionary changes. All changes were only upgrades in the sense of “as small as possible” modifications of the system, leading to the fact that the previous business rules that are not valid anymore, represent a severe restriction in adapting to the ever new business requirements. Considering this it would be impossible, without a severe and costly refactorization, to upgrade the system, to meet the new requirements. Even though some of these requirements are somehow simulated in the current system (for instance, the user has to manually perform certain operations, like merging or separating the data in Excel), they are far from being implemented. Thus, the advantage of developing a new billing system “from scratch”, besides the advance in technology, is also, that “new” business concepts can become the “base” business concepts of the new system. Even though changes in the business concepts are not so frequent, the design of the new system is such, that the nowadays business concepts and business rules are not the “only” concepts, but “one of the” concepts possible to implement in the system, leaving “the door open” for new business concepts and rules, by only applying relatively small modifications (if at all needed).

Because of the growing pressure on the market, the suppliers are forced to search for new marketing approaches to keep the existing and to attract new consumers, thus it is important, that they have the possibility to apply ever new services and benefits for the customers, which would make their offer more attractive. At the present moment, only the price of the electricity seems to be the criterion for choosing the electricity supplier, but as more as the market will stabilize, we expect that the quality of service will also become a an important criterion. Having this in mind, the new billing system provides many different possibilities to offer benefits to the consumer and quality of service improvements:

- Percentage discounts
- Quantity discounts
- Amount discounts
- Quantity variable prices
- Payment by installments for additional services
- Electronic bills

- Portal for customers
- Understandable and user friendly bills
- etc.

An important advance in functionality is also the billing automation of electricity production by small power-plants, which became very popular in the latest years. These small power-plants produce electricity by using sunlight, water or gas as an energy source.

CONCLUSION

The experience of electricity market opening shows that this is an organizational, legal and technically very complex process, which is also quite time consuming. We have focused on the analysis of the organizational changes and its impact on retail electricity market in Slovenia. Consequences in Slovenia can be seen in the emergence of new market participants and a very tough fight for each customer.

The first effects of market opening are reflected in an increasing number of electricity suppliers switching and a growing number of different energy supply packages or bundles for customers. Also in context of IT solutions major changes and adjustments were needed. In particular, we highlighted the necessary changes to the billing system that were a technical consequence of the formal requirements. Besides these formal requirements, we had to focus also on the new business requirements, which emerged after the opening of the market and had to be met, to the increase of competitiveness of the suppliers, who became forced to struggle for their customers.

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