In the report the process of development planning in Polish distribution companies is presented. Polish Energy Law, that created the bases for restructuring process of Polish energy sector, foresees such process. The development plan to be prepared by companies owning the network is the obligatory document foreseen in this law and the domains of distribution company activities to be planned within such document are also listed there. The necessity to agree the development plan with the president of regulatory office, foreseen by the law, caused the insertion of the obligation to prepare the first development plan till the end of 1999 into the license for transmission and distribution awarded to the network transmission and distribution companies.

In the report the activity of distribution companies towards elaboration of standard content of development plan enclosing the presentation of company needs and opportunities within the framework of regulatory rules is described. A special team of their representatives was called the deal with the task. The results achieved by that team and the application of these results to the preparation of development plan of a distribution company are subjects of the report presented. The various parts of development plan are reviewed in details.

The outcome base for planning is the current situation of a company described by the set of the data characterising its present activity. The information about the market served is of particular importance (towns and villages supplied, license territory, types of customers- industrial, residential or rural). The power sources used to cover the load should be also presented (types, capacity, forecasts of future operation). The existing network description including its length on various voltage levels, the reliability of the network, losses during energy distribution are also needed. The information concerning the quality of energy supplied is of particular importance.

Present energy consumption and the forecast of its future development are also of basic importance. One of the results of power sector restructuring process is the necessity to prepare the forecast of market development (taking into account possible changes of supplier by the customers following the schedule of electricity market liberalisation). The balance of power and energy demand and possible supply opportunities taking into account losses should be presented for the years of planning horizon. The forecast of demand growth should be split into voltage levels to facilitate the inclusion into consideration during the network investment planning.

Having the data listed before, concerning also the state of technique and assets depreciation, the proposals for network modernisation and development and also for new power source constructions including renewables can be considered. In result the concise investment plan for the planning horizon should be presented. Such a plan should inform about the types of investment (network, information technology, telecommunication, and buildings) and present the reasons for the choice proposed. Feasibility analysis, environment protection and regulatory indications should be should be used as the particular investment justification.

The resources to finance the proposed investment plan should be also proposed. The income planned basing on tariff system proposed together with the cost forecast should be presented in form permitting the evaluation of possible investment funds. For this goal the projections of finance statements (balance, profit and losses, cash flow analysis) taking into account credits available should be elaborated.

The important issue considered by the regulatory body is the confirmation of the network development plan takes into account the needs of network development foreseen in plans elaborated by district authorities on the territory under license. Following the presentation of development plan content some remarks and conclusion basing on current experience concerning its construction are proposed.
DEVELOPMENT PLANNING IN POWER DISTRIBUTION COMPANIES IN POLAND

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In the 1990s a fundamental reform of the electric power industry was initiated in Poland. The primary aim of this reform was to implement such a structure in that sector so as to introduce market economy to the electric power supply. The commercialisation and subsequently privatisation of electric power enterprises were considered to be the essential elements in the process of transformation. The first step was to divide the regional state owned enterprises, which were integrated vertically, into smaller units – joint-stock companies with the activity limited only to the generation, transmission or distribution of electric power. In the next stage the Energy Law was passed in 1997 and the Power Industry Regulatory Office (Urząd Regulacji Energetyki – URE) was created.

The aim of this paper is to present the issues connected with development planning in electric power distribution companies in terms of both legal regulations governing this branch of economy and other documents created by such a company or required from it. This paper will also discuss the content of such plans and present conclusions concerning the procedures assumed in practice.

LEGAL CONDITIONS

The energy policy of Poland is based on Energy Law, passed in 1997. This legal act established the principles of energy policy presented below:

- ensuring energy security of Poland, i.e. meeting the current and future power demand in a technologically and economically feasible way, while maintaining environmental protection standards;
- conservation and efficiency of fuel and energy consumption;
- protection of the interest of consumers against unjustified price hikes;
- obligation to obtain a licence in order to carry business activity in gaseous fuels, electric power and heat supply;
- the obligation to prepare tariff system and to have it approved by the President of the Power Industry Regulatory Office;
- the implementation of planning process in the power transmission and distribution subsector, as well as in administrative districts, by imposing the obligation to prepare certain planning documentation;
- the establishment of the Power Industry Regulatory office, the president of which is given extensive powers, among other things, to settle disputes, approve development plans for power enterprises, to grant licences, to approve the tariff systems, as well as to impose penalties.

It should be emphasised that the energy law provides the framework for the activity of the power sector, while detailed guidelines concerning the activity within this sector are included in executive regulations to the act.

The basic regulations governing the activity of the electric power subsector are:

- the Regulation of the Minister of Economy on the detailed conditions of consumer connection to the grid, on covering the connection costs, on principles of the electric power supply, on provision of transmission services, on principles of power grid operation and maintenance, as well as on quality standards in consumer services,
- the Regulation of the Minister of Economy on the detailed principles governing the creation and calculation of tariff systems and settling accounts in electric power supply,
- the Regulation of the Minister of Economy on the obligation to buy electric power from unconventional and renewable sources of energy and the power from combined heat and power plants, as well as heat from unconventional and renewable sources.

PRINCIPLES FOR THE CREATION OF DEVELOPMENT PLANS

Development plans must be consistent with some legal acts and important documents. Besides the Energy Law the most significant one is: “Principles of the energy policy of Poland until the year 2020”. This document, defining the strategies and state policy in the areas of energy generation, transmission and use, was adopted by the Council of Ministers in February, 2000 [1]. Other documents and issues affecting significantly the process of development planning are presented below.
Licences

Licences cover the following areas of business activity: electric power, heat, liquid fuels, and gaseous fuels. They are permits to conduct business activity in a given area in accordance with the terms of the licence. One of the terms of licensed activity in the transmission and distribution of electric power is the obligation to prepare development plans concerning power supply in the area covered by the licence. Licences are granted by the President of the Power Industry Regulatory Office.

As far as electric power is concerned, obtaining a licence is required to generate energy from sources over 5MW, transmission and distribution when the power ordered by consumers exceeds 1MW, energy supply when the annual turnover value exceeds 100,000 EUR.

Tariff systems

Power enterprises having licences in certain areas of business activity, such as gaseous fuels, electric power and heat, propose their tariff systems to be approved by the President of the Power Industry Regulatory Office.

Tariff systems for electric power should be set up in such a way so as to:

- ensure the coverage of full justified costs of conducting regulated activity, including also a suitable (adjusted to the risk level and acceptable for the consumers) rate of return on the invested capital (as profit for capital owners),
- establish strong and permanent incentives to lower costs in regulated enterprises,
- transfer benefits connected with the reduction of costs to consumers and to limit the range and costs of regulation.

Experiences collected over the recent period of new rules in power business indicate that prices and rates of charges should be calculated on the basis of planned costs, and not costs incurred in the past. In this context the whole process of establishing development plans for enterprises gains significance, as to a large extent they will affect the process of establishing the rates of charges.

The level of these rates has a significant effect on the revenues of a company and – after the costs of conducting business activity are deducted – on the basis of this income it is possible to determine cash flow, which may be used to implement development strategy.

Consumers connections to the grid

The issue of new consumers connections to the grid has a considerable impact on the investment aspect of the development plan. In the previous system of law regulations, consumers were connected to the grid as a joint investment of the power network company and the connected entity. Nowadays it is solely the investment of the power network company, whereas the consumer which is being connected to the grid pays a fee for the connection.

The main principles concerning the connection of consumers to the grid are as follows:

- power grid companies are obliged to realise and finance the construction and development of the network and the portion of line connecting individual consumers to the grid, under contract terms defined in the connection regulation, provided these investment is planned in the document prepared by the district administration named “The assumptions for the plan of heat, power and gas supply for the district hole area or its part”,
- a fee for the connection to the grid is payed by customers in accordance with tariff system approved for the distribution company,
- the connection fees are calculated on the basis of ¼ average annual investment expenditure for the construction of network sections used for the connection, defined in the development plan of the distribution company.

The grid company should thoroughly plan its investments needed for connections on the basis of signed contracts for the connection to the grid with customers, drafts of such contracts send to customers and demand for the connections to the power grid by the district administrations within the license area.

Co-operation with districts in the planning process

The planning and organisation of supplies of heat, electric power and gaseous fuels are the responsibility of the district administration and is realised by the district administration in accordance with the principles of energy policy of the state and with the established by this administration local area development plan.

This document mentioned above as “The assumptions for the plan of heat, power and gas supply for the district hole area or its part” is prepared by the district managing board under the obligation of Energy Law, using the information and proposals supplied free of charge by power companies. The district council passes the assumptions for the plan, prepared in such a way. This document should be taken into consideration in development plans for network companies.

In case the assumptions for the power supply plans are not reflected in the development plans of network companies, the district board may prepare another document, “The draft of energy supply
plan for the area of the district”, which is established on the basis of the adopted assumptions. The activity of power companies must be consistent with the framework set up in this draft. Alternatively, if no investment activity is developed by licensed distribution companies, the district authorities might realise the prepared project signing contracts with other companies. District authorities, while preparing the assumptions for the plan of supplies in electric power, heat and gas, should incorporate in the highest possible degree unconventional and renewable sources of energy, making profit of their ecological and economic advantages for the area of the district.

**Power distribution company development plan**

Development plans prepared by a power grid company serve two functions. Firstly, they define development activity of the network company itself and secondly, they are a source of information for outside parties interested in the potential access to energy carriers. After the amendment to the Energy Law was passed in 2000, the legal obligations of network companies connected with the preparation of drafts of development plans are as follows:

- the plans are prepared for the planning horizon at least three years,
- the plans are prepared in such a way so as to ensure the minimisation of expenditure and costs incurred by the company and also to prevent a situation when in individual years the expenditure and costs could result in excessive rises of prices and rates of charges for gaseous fuels, electric power and heat,
- it is necessary to ensure the consistency between the company’s own plans and the assumptions and plans prepared by the district administrations,
- the entities already connected to the grid are supplied with information on planned projects in such a scope in which these new enterprises are going to affect the operation of connected facilities, change the connection or supply conditions of electric power, gaseous fuels or heat,
- the schedule of investment realisation is defined in the plan.

The Energy Law requires the approval of the proposed development plan by the President of the Power Industry Regulatory Office. The President of the Regulatory Office, during the procedure of plan approval, analyses them in terms of their consistency with the law and the energy policy of the state. The role of the plan – from the point of view of distribution companies – is to:

- present the investment needs necessary for the realisation of the obligations imposed on the companies in terms of concluding and completing contracts with consumers in accordance with the introduced quality standards in the licensed area,
- obtain the approval of the Regulatory Office for the suggested partial aims of the investment plan proposed and their priority,
- have the investments (planned on the basis of local area development plans and assumptions to the plans of energy supply) recognised by the Regulatory office as justified or to receive objections presented by the Office in this respect,
- have the necessary capital expenditure and necessary income connected with it basing on proper tariff system approved by regulatory authorities.

From the point of view of the regulation process, the development plan projects should correlate with the period in which the adequate tariff system remains in force. The maximum period for a tariff system should be in force was considered to be three years (while having the prices indexed using the RPI-X index each year). Thus, it was decided to assume the three-year period as the most suitable time frame for development plan drafts. Obviously, long-term plans may and should also be prepared by companies to serve their own needs [2].

**The suggested framework content of a development plan draft**

The framework content of development plans presented below is a result of consultations conducted by the Regulatory Office and the representatives of the energy distribution sector. It is a compromise between the requirements put forward by the office and the capacity to obtain data by the distribution companies using data bases available to them. Eventually the following form of the development plan draft was established.

**Introductory chapter.** It contains a concise characteristic of the company and presents both external conditions and those resulting from the company standing.

**The description of the current activity of the company.** It contains a characteristic of the market being served (the districts in the company license, the surface under license, consumer types – industry, municipal, agriculture). It discusses the share of consumer types in the sales of power. It presents current sources of electric power (types, capacity, capacity reserves, predictions concerning the future of these sources). It presents a general characteristic of the network, giving information on
the structure in terms of voltage, reliability, technical state of the grid (losses) and other data depending on the needs. It presents the situation in terms of realised electric power quality standards.

The determination of the current and future demands. It presents a concise description of the assumptions and methods adopted to prepare forecasts of market development. It describes a forecast of market development adopted in the process of development plan draft preparation (changes in the demand for power output and electric energy consumption; changes in the number of network users and other information depending on the needs). The forecast comprises the sales of electric power in terms of particular rates of tariff system presented quantitatively (MWh) and in terms of value (PLN), as well as planned purchases presented quantitatively (MWh) and in terms of their value (PLN) in the planning period. It gives sources of electric power used to meet the demand along with the degree to which they are used. It presents the timetable of consumers free access to the transmission services permitting them the choice of power supplier in the area under license.

Undertakings in modernisation, development or construction of a network as well as possible new sources of electric power, including also unconventional sources. This chapter contains the aims and a development plan of the distribution system. It presents a concise description of the investment plan – the type structure of the investments, a general characteristic of the undertakings, technical and economic justification for its realisation. It also presents the conditions resulting from the requirements of environmental protection. It discusses forecasted economic results of the investment.

In this area it is essential to take into consideration the forecast concerning the new connections to the network of the distribution company. This forecast should include sections of the WN and SN lines planned for realisation (divided into cable and overhead lines), the number of WN/SN and SN/nn stations, the length of low voltage lines (divided into cable and overhead lines) as well as the length of service lines (divided into cable and overhead ones). It is suggested to prepare the forecast on the basis of statistical material from previous years, currently signed and scheduled contracts for connections to the grid and the assumptions for the energy supply plans adopted by the district administrations. The forecast should be matched with the increase in the connection powers planned for the analysed period. The presented data will be used to develop a scale of rates for connection fees. The forecasted value of revenue from connection fees should also be established (25% of expenditure for the construction of network sections used for the connection).

It is also necessary to prepare a forecast concerning investments in such areas as information technology, telecommunications, remote control of some substations, measuring and devices and systems, backup power facilities and electric power generation plants.

Undertakings aiming for fuel and energy efficient use and conservation. The chapter contains a concise description of planned undertakings directed towards efficient consumption of fuels and energy by consumers (efficient lighting, load peak shaving). The economy of investment planned in this area is discussed and some new projects proposed.

Projects improving the efficiency of the company operation. The chapter contains a concise description of planned undertakings aiming at improved efficiency of the company operation, especially projects requiring the input of investment funds as well as the assumed economic results of the above mentioned undertakings (changes in technology of devices used, eliminating the less reliable components, introducing the automation systems).

Forecasted method of investment financing. A concise description of the way in which the investment is going to be financed – sources and the structure of financing investment expenditure. A presentation of possible options of financing investments at the assumed level of profit and depreciation rates and also credit options.

Forecasts of financial statements. This chapter shows the potential for financing the assumed development plan – in terms of generating the company’s own funds for the realisation of the investment plan and the potential for settling the indebtedness (in case of financing using credits). The forecasts are presented in the form of tables and show:

- a condensed balance;
- a condensed profit and loss form;
- a condensed cash flow;
- a plan for the revenue and costs of business activity in license areas;
- financial indexes concerning profitability and liquidity;
- information concerning the amount of company’s debt resulting from long-term credits.

Forecasts concerning revenues and those concerning the sales of electric power (MWh) in the area of operation of a given distribution company in individual years make it possible to
establish index prices for electric power transmission services and electric power supply for the planning period in question.

Conclusions

The preparation of firstly made development plans encountered several problems. In result of according process several towards the proposed plans were formulated by The President of Regulatory Office [3].

The proper preparation of development plans was hindered by some lacks in the local physical development plans and the assumptions for the power supply plans for the districts, which were to constitute a basic source of information concerning the size and structure of the demand for electric power and the necessary infrastructure. Another difficulty faced in the process of plan draft preparation turned out to be the differences in the available macroeconomic figures (inflation index, interest rate, exchange rate, etc.).

Some problems were caused for the companies by the issues concerning the efficiency of the company's operation and the conservation of energy consumption on consumers side. There is a lack of experience in this area.

In some cases reservations were raised concerning the high increases in capital expenditure in the year 2000 assumed by power companies in relation to that of 1999. In some cases they exceeded 200%. This increase resulted to a large extent from the distribution companies incurring in full the connection investments, instead of the former practice where the party being connected to the grid carried some of the burden.

In case of some types of network investments it was also essential to establish to what degree these investments are going to be properly used in the licensed activity as opposed to the unlicensed one. The total cost resulting from the investment should not be ascribed to the licensed activity if it does not serve solely the needs of distribution promotion (it concerns e.g. investments in telecomputing).

The basic sources of investment financing in the subsector are depreciation write-offs. The share of the other financing sources in the subsector is approx. 20%.

The most important item in the structure of investment construction is the modernisation and development of the network – on average it is approx. 70%.

The results of business activity in transmission services and energy turnover indicate the subsidising of the distribution activity using profits from energy supply. Such situation is temparaly maintained to avoid the sharp price increases for certain goups of customers.

There are several justified objections to the legal regulations governing the activity of distribution companies in cities and districts in accordance with energy supply plans adopted by the local governments of municipalities and districts administrations. This does not eliminate the obligation imposed on distribution companies to co-operate with these institutions in the planning and realisation of connection construction and network development in these areas.

The problems with the co-operation result from:
- limited investment resources for the development of the network in distribution companies,
- the necessity to justify economically the investment of resources in these companies,
- a lack of supply network concepts in the assumptions to the energy supply plans prepared by district administrations, which prevents the incorporation of individual tasks (length, type and capacity of lines, the type and capacity of transformer substations) in the development plans of distribution companies.

The amendment to the Energy Law in 2000 extended the range of documents prepared by the districts administration, which need to be taken into consideration in the development plans of distribution companies. It did not, however, solve the problem of smooth co-operation between these companies and districts in the process of planning energy supply.

References