

Metering segment - electricity metering line:

Pursuant to Central Statistical Office of Poland in three quarters 2016 in relation to 2015, the increase by 18% of the production sold of electricity meters was recorded. The main reason of the growth was the exchange of residential electricity meters due to ending validity period of their legalization.

In case of smart metering market in Poland in 2016 there were only single orders mainly related to striving for more effective management of electricity consumption. Aparator SA performed among other things data read out system for about 4000 smart electricity meters operating in MoniTorus system for the dispersed commercial branch offices. The supplies of smart electricity meters in Smart City Wrocław project for Tauron Dystrybucja were continued and the supplies of smart electricity meters under the contract with PKP Energetyka commenced. Monitoring segment of electricity consumption by use of SaaS modern business models is perspective one.

There is lack of official schedule of implementation of smart systems and electricity meters in Poland that has negative influence on R&D priorities and in addition it makes the future uncertain among potential supplies. The project of new government strategy of development assumes the implementation of smart electricity meters till 2020 in the chapter concerning the reduction of CO₂. In 2016 innovative firms of distribution sector continued their implementation programmes. It should be pointed out that Energy Regulatory Office has suspended its decision regarding the financing of AMI infrastructure but on its website uncomplete technical specification has been announced concerning the implementation of smart metering system. The complete set of documentation for the Polish market will include the needs of the market (both Distribution System Operators and electricity consumers) and suggestions of the industrial sector related to Smart Grid as well leading to the application of the cutting edge open technologies available and to offer the safe product in the scope of its usage and management of metering information as well.

Technical requirements for „smart meters” in Poland are prepared by the members of Smart Power Grid Section at Polish Chamber of Commerce for Electronics and Telecommunications. The requirements in very high degree take into consideration the achievements of the Energy Market Workshop which effect was the standpoint of Energy Regulatory Office concerning AMI giving it more precised form with details. Functionalities having the impact on free excess of energy consumers to metering data that concern their usage (or usage and generation) have been taken into account. The Chamber has suggested the detailed sector propposal of “specification for smart meters” to be applied for further legal works concerning the implementation of AMI Infrastructure. Inter sector consensus obtained concerning technical aspects of future standard for AMI in Poland one should recognize as the further significant step towards the increase of efficiency energy management, implementation of the assumptions concerning Smart Power Gridsw Polsce and compliance with the requirements of the Act on Energy end-use efficiency and energy services Act 2006/32/EU and the appendix I.2 to the Directive on electrical energy 2009/72/EU, obligatory also in Poland to implement 80% of smart meters until 2020.

During 2016 were held the consultation concerning coherent, modern and safe communication and telecommunication for all public sectors within National Digital Radio Communication System among other things for power engineering sector. The representatives of Aparator SA and Aparator Elkomtech took part in consultations.

On the other hand at the end of 3Q 2016 National Centre for Reasearch and Development announced about the start-up of important sector programmes for power engineering. For the financing of 50% can apply the entities and consortia operating for smart power grids sector. The first of the above programmes where the leader is Polish Chamber of Commerce for Electronics and Communications and Warsaw University of Technology named IUSER will be supporting the development of innovative technologies “smart” for the industry and end users. The next programme named InnoPBSE, where the leader is Polish Electricity

Association will be supporting the development of cutting edge technologies favourable to flexibility and modernization of power grids. The first stage of both sector programmes will be of total value of PLN 275 m and it can have significant impulse for the development of manufacturing and services sector operating for power engineering. The application will be submitted in 4Q 2016 and the first part of the programme will last for 2 years.

Smart Metering in Europe, in spite of its successive implementation it faces the delays related mainly due to lack of technical standardization and careful approach of utilities to new but vendor lock group of technology suppliers. Probably the objectives related to the efficiency directive (80% smart meters until 2020) will not be accomplished completely in some EU countries.

Apator SA actively participates in many consultations regarding the perspective of development of the idea of smart grids and smart metering in Poland and also it has been watching the actions being taken for that reason in Europe. The organizations supporting the research and development processes for smart grids implementation in Poland are as follows: Consortium of Smart Power Grids Polska and Smart Grids Section at Polish Chamber of Commerce for Electronics and Telecommunications. Ministry of Economy has accepted the document titled "List of Strategic Projects for power engineering infrastructure" within the Infrastructure and Environment Operational Programme 2014-2020, with implementation project of smart meters and investment in smart power engineering included. It is planned to give the support for the development of electrical motorization and storage of energy what should give impulse to the investment for flexibility and automation of power grids.

The main obstacle for the development of smart metering technology in Europe is lack of standardization. In order to eliminate the obstacle, some actions are taken by the organizations aiming at the shaping of European standards in this scope. Apator SA is the member of the following organizations;

- ESMIG(European Smart Metering Industry Group),
- OSGP Alliance,
- G3-PLC Alliance,
- PRIME Alliance.

Anticipating the risk of delays Apator is prepared to supply both traditional meters without communication and smart meters as well, owing to it the delays do not have negative impact on condition of the business related to metering of energy.

Metering segment – gas metering line:

After weak first half of 2016 where in production sold of gas meters decreased by 16% in relation to the same period in 2015 was noted, the production sold of gas meters pursuant to the data of Central Statistical Office of Poland the production sold of gas meters in the three quarters 2016 increased by about 2% in relation to the same period in 2015. For gas metering line, APATOR GROUP has established its strengthened position on the Polish market that is important sales market.

Gas meters market since 2006 has been under transformation. Traditional mechanical gas meters are gradually replaced by smart gas metering. In European Union countries smart meters are more and more popular. The first market in Europe where the regulator imposed the application of smart gas meters instead of traditional ones was the Netherlands. During the following years France and the United Kingdom did the same. The come out of smart gas meters caused the decrease of demand for traditional gas meters. The trend was the strongest in Italy that caused price war and considerable decrease of prices. In other countries the research and works on legal regulations enabling to use smart gas meters have been continued. Currently, bellows gas meters with electronic counters take the lead and more and more the trend to implement static gas meters is noticed.

In the recent period the first large joint tenders for smart gas meters and electricity meters were invited. It means that in coming period the demand for smart gas meters in Europe will decrease definitely. In 2016 APATOR GROUP carried out intensified works concerning the participation and the performance of tenders that current positive effect are the supplies of smart gas meters carried out to the Dutch market in 2016-2020 by Apator Metrix and GWi. The supplies will be performed under the contracts signed by Landis+Gyr AG and Flonidan A/S in result of tender invited by Liander NV. Furthermore, Apator Metrix, in cooperation with partners has been supplying considerable quantities of smart gas meters to the British market for two years.

More and more frequent the projects of implementation of smart gas metering come out on domestic market, currently there are only single, not large orders since it is the result of permanent restructuring and changes made in the sector.

Metering segment – water and heat metering line:

Pursuant to the data of Central Statistical Office in Poland the production sold of water meters during the three quarters 2016 decreased about 23% in relation to the same period in 2015, however in relation to the first half 2016 some improvement occurred caused among other things by the economic trend on housing market. In Poland about 40% of new installed water meters are smart ones furnished with communication module for the data remote reading.

In previous years Russia was the important market for water and heat metering line, however the number of orders from that country decreased considerably due to political situation that has the influence on finances (among other things on rouble exchange rate) that causes the freezing of construction investments and strong price pressure. The decrease of sales to Russia is compensated by the sales to other markets, particularly in Western Europe. It is expected the increased demand outside Europe from African countries that have better and better access to the aid programmes among other things from European Union and World Bank destined to obtain better access to drink water.

The market for water metering services in Europe and in the world has been growing, however there is the need of more accurate methods of measurement that are positive prognosis for ultrasonic water meters. In 2016 Apator Powogaz continues its activity leading to complete the product portofolio both in the scope of new ultrasonic technologies and telecommunication technologies. The acquisition in the second quarter 2015 of the Danish company will allow to start up the production of own water meters and ultrasonic transducers already in IV quarter 2016. Static ultrasonic technology will „open the door” to high developed markets and it also allowing to increase share in the market of the most demanding customers like water companies, heat distribution companies and the industry. Static metering technologies such as ultrasonic flow measurement are more accurate, metering equipment based on them is more durable and more resistant to damages /no movable parts/ and they are easier and cheaper for the maitenance and they are easier to integrate with communication modules in order to establish automated networks for the supply of water and heat.

In result of the further performance of the strategy of water and heat line in the period of 2016 the actions concerning the integration with Fellows s.c. – acquired technological company were continued and it among other things has inductive radio modules, advanced GSM data reading systems and mesh type communication technology and then iMeters sp. z o.o., that has mesh technology. Modern radio technologies making the access of communication channel to internet (M2M), give the possibilities of data remote reading, monitoring and diagnositics of entire installations and systems providing all utility services (water, heat, electricity, gas).

The heat sector both in Poland and in Europe is of low growth 0-2% annually (in some years it is negative one) and it is based mainly on exchange of equipment due to the process of legalization. The low stack emission programme commenced in many large Polish cities means increase of orders for the long time. The enhancement of the awarness among consumers has positive influence on heat metering service market and

also changes in legislation e.g. recently new obligatory heat metering has been introduced in France and in previous year in Czech Republic.

Further to the liquidation of law stack emission in towns (emission related to transport, emission of dust and hazardous gases coming from local coal burning boiler houses and coal burning stoves) perspectives for development of the sector are getting better. Larger cities in Poland like Warszawa, Łódź or Katowice invest in smart heating systems (i.e. Warszawa has completed the performance of the exchange of heat centres), that generates additional demand for smart technologies with heat meters having data remote reading system included. Important driver for the growth of district heating and heat meters segment becomes currently low stack emission limitation programmes in the large cities since in the result of them part of consumers with coal burning stoves join to district heating system. In June 2016 „Green Podhale” power engineering cluster was established. It is the union of over 30 communities in Podhale under the leadership of AGH University of Science and Technology in Cracow among other things aiming at limitation of law stack emission by use of modern technologies. APATOR GROUP expressed its interest in joining the group for this purpose.

It was noticed that electricity distribution companies had commenced to acquire heating companies diversifying distribution activity to other utility services. In the recent months there was the discussion in European Commission on the possibility to start-up large programmes increasing power engineering efficiency basing on new investments in the infrastructure of central municipal heating and cooling systems that in many countries in Western Europe (excluding Germany and Scandinavia) are poorly developed. Poland is going also to implement completely Transposition of Power Engineering Efficiency Directive where the term of individual metering and settlement of the costs of heat consumption is supported. The European Commission estimates the savings owing to individual metering and settlement (i.e. heat cost allocators) of 15 to 30%. Metering and cost settlement of heat segment in Poland made that the margin was recovered in 2016 after the period of intensive price war in previous years. It creates good conditions for the growth of sales both heat meters and heat cost allocators for long time.

Automation power grid segment – ICT line:

The term of ICT in power engineering is broad and it covers different types of applications from management of power engineering business to applications related to technical inspection of power grid operations. The Polish power engineering firms invest not only in areas related to traditional applications such as Billing or ERP but also in areas of trading, distribution and management of power grid assets.

In Apator Group ICT line covers power grid inventory services and IT systems of management of power grid assets. It is the area of the activity of the subsidiary - Apator Rector sp. z o. o. Applications and services related to Power Grid Assets Management and inventory have been implemented by some of Distribution Network Operators. Revenues in this segment in the following years apart to obtain of new orders will be related in high degree with data updating and modernization of already implemented systems to DMS class and maintenance and service. Unfortunately due to restructuring processes and many changes introduced at management level of some Polish Power Grid Operators and related to it the budget limitations (especially in area of IT) the key decisions related to the performance of IT contracts and services were suspended. Furthermore, in three quarters 2016 the considerable decrease of IT orders in public sector was noticed. In 3Q2016 the decrease was 38% in relation to the same period in previous year and it was followed by the decrease of new orders in power engineering. Such big decrease of demand on the Polish market is partly related to the delay of announcement of infrastructural public tenders caused by some problems concerning the run of new pool funds for IT and digitalization. The influence on such situation had among other things non compliance of Poland with new regulations of European Union concerning public tenders. The negative factor in face of smaller number of tenders is also progressive price erosion.

In 2015 technical consultations were announced and tenders invited for IT sector for power engineering concerning the following issues: HES (Head End System), application of registration of renewable energy sources, ordering the exchange of data concerning retail market of energy in EbIX standard (Polish Power Transmission and Distribution Association) and the tender for the supply of internet auction enabling platform to perform the auction for sale of electricity generated in OZE installations (Energy Regulatory Office). The most innovative Operators of Distribution Networks announced the official development plans concerning „smart network technologies” covering the development of different functionalities among other things being performed by products of Apator Group such like:

- automated location of short circuits and power restoration (FDIR),
- development of management systems of power switching on (OMS),
- larger investment on remote control switchgear,
- development of management system of power flow in the network is based on actual topology of the network (NMS) linked with association of the information with data regarding the property and data of geographical location (GIS)
- development of comprehensive services for prosumers

The direct investments have been continued in segments of Smart Home and Smart Grids (e.g. Energa - Smart Toruń, Smart Gdynia and Smart Tauron - Smart City Wrocław, Tauron Folovoltaics). The Ministry of Energy announced the plan of the establishment of power engineering being the one of tools for the performance of energy policy and effective management of energy.

Power grid automation segment – control and supervisory line:

During coming five years the expenditures for power engineering infrastructure of the largest operators of distribution power grids and Polish System Operators were planned at high level of PLN 42 bn. The Ministry of Economy accepted the Project pipeline for power engineering infrastructure that takes into account the partly financing of these projects by European Union.

In March 2016, the Directive 2014/25/EU – of European Parliament and of the Council on procurement by entities operating in water, energy, transport and postal services sector came into force and at the same time repealing the Directive 2014/17/EU. Directive so called sector one introduces among other things the European Single Order Document that decrease the documentary obligations when bidding the tender (postponing the detail documentation), it also introduces the exchange of documentation in electronic form exclusively between ordering parties and participants in the tender. The regulations of the directive came into force on 28th April 2016 and in June the Polish Act of Public Procurement Law was amended. Amendments regarded simplification and making shorter the tender proceedings, increase of the magnitude of negotiations and the possibility to define only the functional requirements or detail technical requirements in Terms of Reference. The amendment to Public Procurement Law caused that total number of tenders invited in 3Q 2016 decreased by 1/5, since the entities of public sector have not been conformed on time.

The decrease is also related to temporary exchange of the managing staff and the staff on operating and technical posts in state-owned companies and limitation of the budget of the Operators of Distribution Companies, particularly in IT areas, resulting out of exceptional currently tight budget for governmental

expenditures. The consequence in face of smaller number of tenders is stronger competition and progressive price erosion similar to the case of ICT line.

Centralization of control and supervisory systems that are currently dispersed in the regions of distribution is one of more important tasks for power entities and it creates the perspectives of development for that line.

Strong impulse of development of the market in 2015 and in several following years will give also the change in the model of justified investment of power grid assumed to be introduced by Energy Regulatory Office already in 2016. New method of the settlement of part so called regulated revenue of power grid enterprises will be based on direct evaluation of quality indicators of electricity being supplied to the end consumers. These indicators have not been monitored in detail till now. The need occurred to install appropriate technical equipment (electricity meters in power stations, registers of the quality of energy and systems of HES/MDM and SCADA class in order to obtain and make analysis of data metering). First tenders for such type of equipment already occurred at the end of 2014 and in 2015 and in the half of 2016. The offer of Apator Group, among other things due to integration with Apator Elkomtech is currently well suited to meet the requirements of new being established market of equipment and systems for smart power grids. Projects carried out in automation of power grid operation in 2014 covered first of all:

- preparation to implement the requirements concerning the security of ICT of power engineering stations (pursuant to customer's requirements),
- implementation of the system covering emergency management central module, pilot project connecting module of emergency management, pilot project connecting functionality of power grid asset management and SCADA supervisory control extended even to low voltage (pilot project of Smart Grid),
- development and implementation of the latest version of WindEx (CIM)
- construction of synergy and technical interfaces between systems of power grid asset management (Apator Rector) and remote supervisory control system (SCADA) (Apator Elkomtech)
- new implementations of applications of automated emergency management and digital applications facilitating the work of repair teams in the field and dispatchers (impact on shortening of power supply interruptions).

Plans of Apator Group include the development of systems, applications and appropriate equipment to the needs of the Polish distributors of electricity including among other things:

- applications for the forecast, scheduling, balancing of energy allowing to forecast the demand of energy, utilizing planning of generating of energy by large producers and then the prosumers, control of performance energy supply and also development of technology of automatic energy supply restoration after the supply failure (in some possible for the performance range); the application of open interfaces and protocols to the systems of other producers.
- development of mobile applications for service teams of power engineering utilizing and accelerating to repair a failure (including the making use of GPS navigation to localize of power grid assets, the access to maps of power grids through Google Maps, the use of tablets by field teams taking into account the protection of data).
- design and preparation of SCADA system of the following generation cooperating with DMS class systems. Integration of huge number of data coming from smart metering systems and pieces of information on the network and a customer is a great potential for the development of analytical systems in power engineering. The construction of interfaces between SCADA, MDM, management of power grid infrastructure systems and other Distribution System Operators of business systems (integration of technical and business systems – IT/OT) creates big pulse for the development.

Further increase of prosumers' installations is expected. Growing number of renewable energy sources will require the investment in the increase the flexibility of power grid operation. Moreover, entire control of energy flow will have to be obtained not only at the highest and at high voltage but also in places where new unstable operating sources of renewable energy will be connected that is at medium and low voltage but also

in places where new not steady operating renewable energy sources will be connected that is at the level of medium and low voltage. Smart electronic equipment (IED) and digital protections for cooperating with the remote supervisory control systems of power engineering network (SCADA), which producers are among other companies Apator Elkomtech SA, will become necessary standard technical tool enabling unstable operation of the network.

Power grid automation segment – switchgear line:

The situation in building sector, particularly number of building permissions issued has the influence on the volume of switchgear sales. The demand for disconnectors and switches that are applied in electrical terminals, substations and distribution substations is driven in high degree by number of buildings and flats put into operation and the demand of electrical engineering services providers.

Number of building permissions issued in three quarters in 2016 increased about 13,7% yoy. Number of flats put into operation increased by 12% in relation to 2015, however the building and construction output in this period considerably decreased reaching 12,6% drop in August 2016. Entire 3Q 2016 was the period when building and construction output considerably decreased and it had only slight influence on order for switchgear and did not cause any threats to the performance of the plan to the end of 2016.

Key group of customers for switchgear line are electrical engineering service providers and electrical installation companies providing integration activity in the scope of establishment of power grids and complex power equipment such as substations and distribution substations. The essential role in shaping the results of the sector have infrastructure investments like; new and modernized industrial objects, public buildings, stadiums, housing estates, main supply points and new and modernized power grids, office buildings, object in the area of fairs, hotels.

The largest companies operating on integrators' market (electrical engineering service providers and electrical installation companies) are large enterprises listed on Warsaw Stock Exchange; APATOR has been cooperating for many years with them. (e.g. ZPUE, Elektromontaż and other)

The following significant group of the buyers of switchgear are large warehouses among other things the Electro Omega Network of Warehouses that associates over 30 members. More and more frequent market practice is consolidation of purchases being made by warehouses in form of established purchase groups co-operating one another in the scope of jointly conduct of negotiations with suppliers of goods and services.

New section of Electrical Equipment Producers was established at Polish Chamber of Commerce for Electronics and Telecommunications. The section was established to solve the problems the companies face with. The main aspect is the presence on retail market, wholesales market, internet and design market of the equipment in the scope of: firefighting equipment, surge protective devices and protective equipment, control and distribution equipment that do not comply with technical requirements and parameters declared. The idea of stopping the losing market by safe and full of standard products caused unfair competition.

In switchgear line Apator SA made significant progress in the scope of development of new vertical and compact fuse switch disconnectors furnishing them with remote communication modules and integrating data regarding the inspection of the status of the equipment with supervisory system being offered by Apator Elkomtech SA. The promotion has been commenced of new smart switchgear of MV/LV station that is the next step in direction to increase the viewing of power grid and its automation. This new product named „4Grid view”, in synergic manner makes use of the metering, switchgear and ICT offers of Apator Group in order to offer to power engineering branch the added value that is related to flexibility of power grid management and information technology resources of the power grid with the support for the reliability of the operation of power grid and the improvement the quality of energy supplies (e.g. decrease of SAIDI and SAIFI coefficients).

Non core activity (other) – mining equipment line:

The biggest problem that the Polish coal mining has been struggling is growing import of cheap coal from the East and decreasing efficiency of coal extraction and growing costs of coal extraction in state owned entities. In 2016 the decrease of sales by 6% in extraction and mining occurred. The decrease of revenues reflected in bad financial result of the branch and lack of financial liquidity in coal mines that had the impact on decreasing number of orders for mining. At the beginning of 2015 the agreement with the government concerning the restructuring of coal mines was concluded. It assumes among other things, consolidation of coal mines and electricity distribution sector in the future and the growth of market force of power engineering sector in relation to technology and equipment providers for mining.

In April 2016 Polska Grupa Górnicza (PGG) was established. Investors (Banks and Power Engineering) will recapitalize new company covering 11 coal mines by the amount over PLN 3,4 bn. The improvement in mining sector is expected at the risk of change of investment from electricity distribution sector to extraction sector. .

The establishment of PGG assumes the assistance to develop the mining sector and the maintenance of the jobs. However it should be emphasised that world economy slowly resigns from coal promoting less harmful technologies for natural environment what may reduce the possible capabilities of export of the Polish coal mines and also companies providing products to that sector. Polish mining sector is the point of interest of investors in Asia and Australia.

Non core activity (other) - control equipment line:

The line covers; industrial automation including drives and applications, and distribution equipment for industry. The market in Poland is very crumbled and competitive and its demand is determined by industrial manufacturing (5% growth in three quarters 2016 pursuant to Central Statistical Office in Poland). Situation in investment areas of the industry has the significant influence on results of the Company, particularly its activity is based on high degree on heavy industry covering the performance of modernization works for mining and metallurgy. Further to the above, due to difficult situation in sectors and stagnation on mining and extraction market, modernization planned and investments are postponed to later periods.