consumption, the development of the country wide using biofuels in various sectors of the economy, especially in agriculture by achieving environmental improvements in the country.

Everything also there is the issue price in the use of biogas plants . This is one of the most significant expansion of the brakes in the implementation of bioenergy . Without the government funding, even in some privileges, Russian enterprises could hardly afford the use of biogas plants to produce their own energy. However, to date the budget allocation subroutine development of alternative energy has already reached 1.5 billion rubles . and continues to grow . The projections for the nearest future, namely 2020, investment volume will have amounted to 19 billion rubles . And electricity production based on renewable raw materials, including agricultural waste, will increase from 2.5% to 4.5%.

Thus, when the possibility of financing the bioenergy introduction at agricultural enterprises and when there are significant advantages of biogas plants is a problem of insufficient activity of Russian enterprises management at the regional level, which are still skeptical and vary the idea of using alternative energy sources. It means a slow growth rate of biogas plants. Additional measures to accelerate the implementation of the growth units may be the following :

- the electricity limitation, replacing it with the consumption in excessing the energy generated through the use of biogas plants ;
- the introduction of social norms to use the electricity for agricultural enterprises ;
- the campaign agricultural producers, summing them to solve the environmental problems to use environmentally friendly sources of energy.

The bioenergy development prospect in Russia is very acute because of the lack of widespread use of energy non-conventional sources . However, due to the distinct advantages of using biomass for energy in the nearest future and this industry is bound to get a wide recognition in our country.

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SCADA system design and security

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Modern electric utilities must meet increasing demand for electrical power generation and distribution while coping with decreasing tolerance for disruptions and outages. One of the most cost-effective solutions for improving reliability, increasing utilization and cutting costs is automating the systems by implementing a supervisory control and data acquisition system (SCADA) [1].

SCADA is typically a PC based software package. The system operates with coded signals over communication channels so as to provide control of remote equipment (using typically one communication channel per remote station). The supervisory system may be combined with a data acquisition system by adding the use of coded signals over communication channels to acquire information about the status of the remote equipment for display or for recording functions [2].

SCADA destination includes data exchange with Remote Control Device (RCD), received data processing, received and processed information display, database maintenance, alarm signaling, preparing and generation of report [1].

SCADA systems are often used by power companies, major Utility Companies, physical sites, manufacturing companies, providers of mass transportation. What concerns power companies, SCADA systems can be used to maximize the efficiency of power generation and distribution processes. More specifically, SCADA systems can monitor the power flow, power line voltage, circuit breaker status, and other electrical processes. SCADA systems can even be used to control individual sections of the power grid [3].

SCADA-system structure incudes:

- Remote Terminal Unit (RTU) – devices deployed in the field at specific sites and locations. RTU's gather information locally from the sensors to report back to the SCADA master unit. RTU's can also issue control commands to the control relays it communicates with.
- Master Terminal Unit (MTU) provides the central processing capability for the SCADA system. Master units connect the human operators to the system with a browser interface that allows the system operator to respond to data gathered from all parts of the network.
- Communication System (CS) provides the connection between the SCADA master unit and the RTU's in the field. It is the all-important link between the far-flung elements of a geo-diverse operation [3].

The three basic functions are the monitoring, control and user interface functions. The monitoring function is to collect data and send it back to the central computer. The control function is to gather data from monitoring sensors, process it and send control signals back to the equipment. The user interface is a large control room where SCADA input and output responses are monitored in real time.

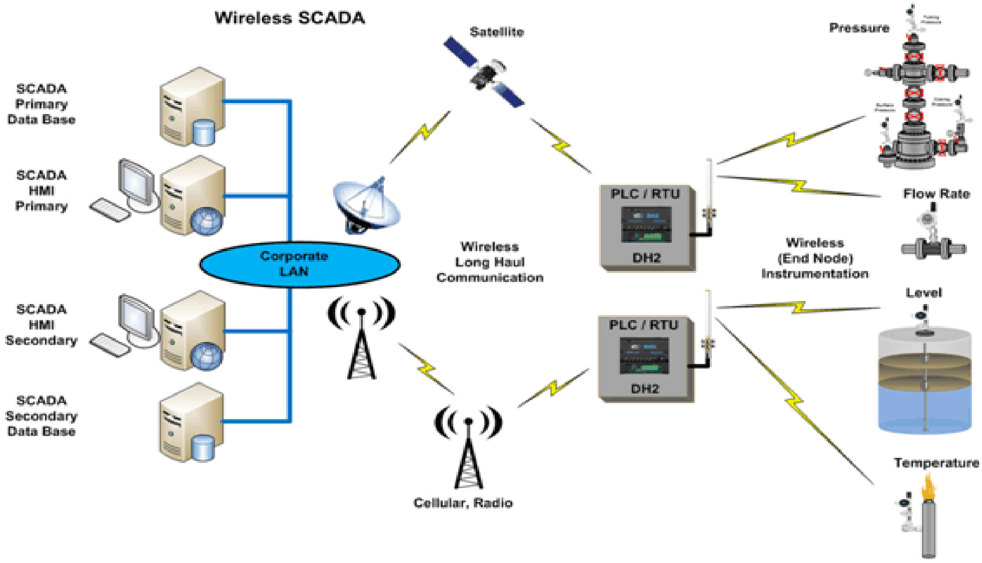

Fig. 1. SCADA-system functions connection.

Today specialists are concerned with providing SCADA security since lots of threats are posed on the system by hackers attempting to penetrate into the network and gain access to control systems. Cyber-attacks on critical infrastructure have highlighted security as a major requirement on smart grid. SCADA system is a technology that helps smart grid to reduce operational and maintenance cost, ensure the reliability of power supply, and provides tolerant of attacks against physical and cyber security. Hence, without a secure SCADA system, it is impossible to deploy the smart grid system [4].

The cyber security basically can be attacked in three steps as follows:
(1)the attacker has control over the SCADA system,.
(2)the attacker identifies the system to launch an intelligent attack,.
(3)attacker initiates the attack [5].

Attackers at the top level include online hackers, terrorists, workers, opponents, or client, and so on. In order to obtain cyber security it is necessary to build an effective, layered defense system to function broadly across the entire grid infrastructure.

To secure data in the smart grid and SCADA system an encryption is used. Proper key management involves restricting personal access to key storage locations, random key updates and encoded key storage servers. Therefore, key algorithms must be validated in a cryptographic system and kept in locations where they need to be [2].

In addition, a robust hardware designed to withstand cyber threats is needed. One example is managed switches which perform multi-functions like access control, traffic prioritization, managing data flow, and so forth. Another addition to existing systems would be the use of firewalls. They block unauthorized access to any network and work according to the user defined rules [5].

The systems are used to mission critical industrial processes where reliability and performance are paramount. The benefits one can expect from adopting a SCADA system are a rich functionality and extensive development facilities. Modern SCADA systems are increasing in complexity, due to the integration of different components produced in many cases by different manufacturers. Thus, it is necessary to address the security level of each device, as well as on the overall environment and integration tests.

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The Structure of the Modern Power System.

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Abstract

The paper describes the modern power system. This article consists of four main parts. In the first part one can find information about the function of generation subsystem, also learn about generators and transformers? their function and work. The next part deals with trans-