



ESF programme “Development of the system for occupational qualifications”

OCCUPATIONAL STANDARD

Biogas plant operator, level 5

The occupational standard is a document that describes the job and competence requirements, i.e. a set of skills, knowledge and attitudes required for successful job performance in a particular occupation.

Applications of the occupational standard

- 1) Preparing curricula and training and programmes that meet the requirements of the labour market
- 2) Assessing persons’ competence, including self-assessment and conformity assessment when the qualification is awarded
- 3) Description of and provision of information about occupations
- 4) Planning a person’s career and laying the groundwork for life-long learning
- 5) Ascertaining and planning training needs
- 6) Preparing job descriptions and recruiting employees
- 7) Comparison of occupations and qualifications

Occupational (qualification) title	EstQF level
Biogas plant operator	5



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Part A JOB CONTENT

A.1 Job content

Biogas plant* operator controls, monitors and operates the control equipment of the biogas production process whereby biogas is produced from biodegradable raw materials** and converted into heat and/or electricity or motor fuel. The work includes activities related to the production of biogas, from receiving the raw materials through to dispatching the final product.

Biogas plant operator normally works alone, responsible for keeping the biogas plant operating and for any hazardous situations or environmental damage caused by their action.

The person is able to solve problems related to their daily work and act in complicated situations in the best manner possible.

The work presupposes communication with the company’s partners.

* a unit consisting of equipment feeding raw materials, digestion tanks, equipment for storing and purifying biogas, and combined heat and power plants or equipment for supplying motor fuel

** agricultural by-products, energy crops and green biomass, bio-waste, sewage sludge and the like

A.2 Units

A.2.1 Monitoring of processes

A.2.1.1 Daily monitoring of production processes

A.2.1.2 Daily monitoring of equipment operation

A.2.1.3 Monitoring the supplies and quality of raw materials

A.2.1.4 Monitoring the volume and quality of output

A.2.2 Process management and optimisation

A.2.2.1 Participation in the first activation of the production process and equipment

A.2.2.2 Controlling the operation of equipment

A.2.2.3 Ensuring the stability of the production process

A.2.2.4 Receiving, feeding and using raw materials

A.2.3 Maintenance of equipment

A.2.3.1 Scheduled maintenance of equipment

A.2.3.2 Organisation of repair operations

A.3 Working environment and specific aspects of work

Work is done alternately indoors and outdoors. A biogas plant is controlled either locally or remotely. In the workspace of the biogas plant, there occur explosive hazards, noise and vibration, exposure to various toxic substances, chemicals or pathogenic micro-organisms is possible, potentially jeopardising the employee’s health (allergy, poisoning or infectious disease). Work presupposes compliance with gas, electrical, environmental and occupational safety requirements. Working time is flexible, with a varied rhythm of work.

A.4 Tools

Main work equipment includes manual and special tools, protective equipment (for example, gas detectors), equipment for measuring and monitoring processes, computers, loading machinery and other equipment.



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A.5 Personal characteristics necessary for this job: abilities and personality traits

The work of a biogas plant operator is supported by an ability to analyse, decide, concentrate and adapt; consistency; emotional stability; and teamwork skills.

Coping with the work presupposes physical endurance, accurate and coordinated movements, an ability to operate at heights, and good eyesight, hearing and sense of smell

A.6 Occupational training

Biogas plant operators have a secondary vocational education in their area of specialisation and professional experience or a secondary education and professional skills acquired through learning in the workplaces. The work requires basic knowledge about chemistry, mechanical engineering, electrical and heat power engineering, and logistics, acquired during in-service training.

Knowledge related to production processes used is acquired at training events organised by suppliers.

A.7 Regulations

Under the Employment Contracts Act, the operator must be at least 18 years of age.

Under the Regulation of the Ministry of the Economic Affairs and Communications, "Requirements for operation control and electrical work", to perform de-energised works or execute electrical circuits, it is mandatory to hold a valid certificate of electrical safety awareness.

Under the Gaseous Fuel Safety Act, it is mandatory to complete training on gas equipment safety.



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Part B

COMPETENCE REQUIREMENTS

B.1. Occupation structure

Competencies whose proof is required when the qualification of biogas plant operator is sought, B.2.1 – B.2.5

B.2. Competencies

B.2.1. Monitoring of processes

EstQF level 4

Performance indicators:

Operator

- 1) monitors, according to instructions, graphs and measuring equipment for the relevant read-outs (such as temperature, pressure, gas composition, current intensity or voltage). Saves equipment operational data using appropriate methods for saving read-outs;
- 2) knows how to use electronic or computer-based control panels in the central control room and work remotely with means of communications connected to equipment for the remote monitoring of equipment;
- 3) checks, assesses and analyses the operation of equipment and instruments according to the instructions. By external inspection and/or installed sensors, identifies any explosive hazard, noise, leaks or other deviations, and locates the causes for faults and the ways and means for their elimination;
- 4) saves data, completes a period log, recording information about the operation and maintenance of and safety events at the plant (for instance, alarms of safety systems);
- 5) prepares documents related to reporting on the quality indicators of raw materials, process or products (plant logs or reports);
- 6) analyses data, and identifies malfunctions, faults and irregularities;
- 7) monitors, visually and using measuring equipment, the quantities and indicators of the biogas and digestion residues (digestate) generated by the raw materials and production process needed in the operation of the plant;
- 8) determines the need for raw material supplies and monitors the conformity of the raw materials to the quality requirements;
- 9) determines the scale and quality indicators of production.

Methods of assessment:

observation in the workplace or test or interview or situational task.

B 2.2 Process management and optimisation

EstQF level 5

Performance indicators:

Operator

- 1) switches equipment, adjusts equipment operating indicators (for instance, controls pumps, valves, feed systems, mixers and equipment) to ensure the efficient operation of equipment If needed, consults with representatives of the maintenance company;
- 2) to ensure the stability of the production process, makes sure that the raw materials match the designated type and properties and do not contain any foreign objects;
- 3) adjusts the production process at the biogas plant based on manuals, work orders and results of the analysis of the production process at the plant;
- 4) handles, stores and issues the raw materials and final product of the biogas plant in a due and safe

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<p>manner;</p> <p>5) controls loading equipment or other equipment for handling raw materials or their processing residues.</p>
<p><u>Knowledge:</u></p> <p>1) knowledge acquired during training by equipment suppliers: nature of the production process used and related principles of operating and maintaining equipment</p>
<p><u>Method(s) of assessment:</u></p> <p>observation in the workplace, test, interview, situational task.</p>

B 2.3 Maintenance of equipment	EstQF level 5
<p><u>Performance indicators:</u></p> <p>Operator</p> <ol style="list-style-type: none"> 1) performs periodic maintenance and minor repairs (for example, oil change or checking play) according to regulations, maintenance requirements and safety requirements to prevent equipment faults or degradation; 2) identifies the ways and means for eliminating any faults detected. Adheres to emergency instructions and, if needed, provides notification about faults detected; 3) organises the maintenance and repairs of equipment according to the repair schedule, involving maintenance companies if needed; 4) duly prepares the equipment for repairs; 5) after repairs, assesses the technical condition of equipment and communicates with other employees to obtain a thorough overview of the condition of equipment; 6) protects tools, mechanisms and equipment according to the purpose of their use; 7) prepares reports on preventative maintenance measures for equipment; 8) determines the need for purchasing raw materials and accessories, based on the quantity of reserve supplies or other preassigned criteria, and prepares and transmits purchase orders for raw materials, adhering to the general terms of agreements concluded with suppliers. 	
<p><u>Method(s) of assessment:</u></p> <p>observation in the workplace or test or interview or situational task.</p>	

TRANSVERSAL COMPETENCIES

B 2.4 General competencies of the operator	EstQF level 5
<p><u>Performance indicators:</u></p> <p>Operator</p> <ol style="list-style-type: none"> 1) attends to the safety and tidiness of the workplace. 2) prepares tools, accessories and personal protective equipment according to applicable regulations and instructions; 3) on taking over the shift, checks the condition of equipment, consulting fellow employees or specialists if needed; 4) can find their way around legislation and regulations concerning biogas production; 5) senses their role in the operations of the company, quickly orients in work situations, copes with conflicts and adapts to changing circumstances; 6) simultaneously performs various tasks, sets the priorities for their activities, and works effectively also under pressure; analyses their activities; 7) controls their emotions, has an understanding attitude to criticism, leans from both successes and failures, requests feedback on their actions from fellow employees and from clients 	



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- 8) uses both spoken and written Estonian;
- 9) able to read and understand foreign-language manuals;
- 10) prepares documents appropriately and intelligibly, adhering to the principles for the preparation of technical documents;
- 11) knows how to use means of communication and computers.

Knowledge:

- 1) professional terminology and units of measurement
- 2) SI system units, simple conversion and comparison calculations
- 3) types and applications of raw materials
- 4) application and quality indicators of commonly used biofuels
- 5) production technology of the biogas plant, and the specific character of equipment installation and technical documentation
- 6) gas, including biogas products, their applications and quality standards
- 7) basic knowledge about electrical engineering, mechanical engineering, automation, logistics, and gas production and utilisation
- 8) programmes needed for the work of the operator and basic text processing and spreadsheet programmes
- 9) principles of environmental conservation and sustainable development.

B 2.5 Occupational and environmental safety

EstQF level 5

Performance indicators:

Operator

- 1) complies with occupational health, environmental conservation, occupational safety and electrical safety requirements under the legislation in all stages of the work processes;
- 2) able to act in alarm or emergency situations: provide first aid, provide information promptly and the like;
- 3) in their activities, allows for potential hazards (explosion or fire) in the working or ambient environment, uses technical safety and personal protective equipment, and wears special clothing if needed
- 4) uses fire extinguishing equipment and ensures their good condition;
- 5) complies with requirements for handling and storing chemicals, and allows for hazards involved in the handling of chemicals;
- 6) uses resources in an expedient and environmentally sustainable manner.

Knowledge:

- 1) impact of the production and use of biogas and digestion residues on the environment
- 2) limit values of the explosive properties of gases
- 3) classification and applications of fire safety and fire extinguishing equipment
- 4) basic requirements for work organisation under the Electrical Safety Act and its subordinate legislation
- 5) waste management principles
- 6) bases of the provision of first aid
- 7) safety requirements for using work equipment



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Part C

GENERAL INFORMATION AND ANNEXES

C.1 Information on the preparation and approval of the occupational standard, on the body awarding occupational qualifications, and reference to the location of the occupational standard in classifications	
1. Occupational standard identification in the register of occupational qualifications	07-15022012-2.1/1k
2. Occupation and qualifications in the occupation	Professional field: Monitoring and operating biogas production equipment
3. Related occupations and qualifications	Heating equipment operator, chemical processes operator
4. The occupational standard is compiled by: names of people and organisations	<p>Rein Oselin, Järvamaa Vocational Training Centre Önne-Ly Reidla, Estonian Power and Heat Association Henry Uljas, Baltic Biogas Kai Pank, Kredex Katrin Tammjärv, National Examinations and Qualifications Centre Ahto Oja, Mõnus Minek OÜ Jaan Allem, Estonian Association of Electrical Enterprises Mati Perker, Tallinna Vesi AS Peep Pitk, Department of Chemistry, Tallinn University of Technology</p> <p>Contributions to the preparation of the occupational standard were made by: Aleksander Maastik, Estonian University of Life Sciences Anne Menert, Department of Chemistry, Tallinn University of Technology Kalle Kahu, MTÜ Eesti Biogaasi Assotsiatsioon (Estonian Biogas Association) Tõnis Kukk, Estonian Gas Association Taavi Malmre, OÜ BiEnTe Ennu Papper, Saare Economics OÜ</p>
5. Occupational standard approved by	Professional Council for Energy, Chemical and Mining Industries
6. Number of the decision by the Professional Council	Decision No. 7
7. Date of the decision by the Professional Council	15 February 2012
8. The occupational standard is valid until	14 February 2017
9. Occupational standard version number	1
10. Reference to the Classification of Occupation (ISCO 08)	313 Process control technicians
11. Reference to the European Qualifications Framework (EQF)	5
C.2 Occupational (qualification) title in a foreign language	



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SIHTASUTUS
Kutsekoda

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In English: Biogas plant operator
In Russian: Оператор биогазового оборудования