TOWARDS A EUROPEAN QUALIFICATION FOR SOLID WASTE FACILITIES' MANAGERS

SWFM-QF PROJECT

NATIONAL REPORT ON QUALIFICATIONS, KNOWLEDGE, SKILLS, COMPETENCES AND LABOUR STATUS OF SOLID WASTE FACILITIES' PROFESSIONALS IN LITHUANIA

2013

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1. INTRODUCTION

The report has been developed in the framework of international project SWFM-QF financed by the EU Leonardo da Vinci programme. The report presents results of a questionnaire-based survey conducted in 2003 in Lithuania by Alytus Region Waste Management Centre and the Institute of Environmental Engineering, Kaunas University of Technology. Three questionnaires have been used in the survey adapted for the following respondent groups:

- Waste management facilities;
- Organisations providing training for waste management facilities' managers and specialists; and
- Associations and authorities.

To collect information, approximately 200 e-mail messages have been sent to potential respondents in Lithuania. Mailing list of the survey covered most of organisations dealing with waste management in Lithuania. Questionnaires have been uploaded in the Internet to simplify the process of filling-in questionnaire hoping to increase response rate. Initial response rate was low. After reminding potential respondents by e-mail to fill-in questionnaires, phone calls have been made to most of potential respondents asking to participate in the survey. This activity enabled to achieve satisfactory response rate.

Total number of responses used in development of this report was 68. Number of waste management companies that actively participated in the survey was 39. Respondents represent the following waste management sectors (respondents could indicate more than one area):

- Waste collection – 27;
- Waste sorting - 20;
- Waste recycling - 11;
- Waste incineration – 0;
- Waste landfills – 11;
- Regional waste management (including administration) - 6.

Taking into account limited number of training institutions providing training in the area of waste management in Lithuania, 8 responses have been collected among these organisations. 2 respondents indicated that they represent organisation that provides registered training programme for waste management professionals, 6 respondents indicated representation of organisations providing informal/ unregistered training programmes that include topics legally required to be included in the training programmes for waste management professionals.

Respondents in the third category represented the following types of organisations (total number of responses – 21):

- National authority – 4;
- Regional authority – 5;
- Municipality – 9;
- Association – 1;
- Other (public institution) – 2.

The report has been developed by the Institute of Environmental Engineering, Kaunas University of Technology with assistance of the Alytus Region Waste Management Center.

2. OVERVIEW OF WASTE MANAGEMENT INDUSTRY IN LITHUANIA

Despite relatively small size of the country, significant amounts of waste are generated in Lithuania. Quantitative data on waste flows in Lithuania is presented in the Fig. 1.

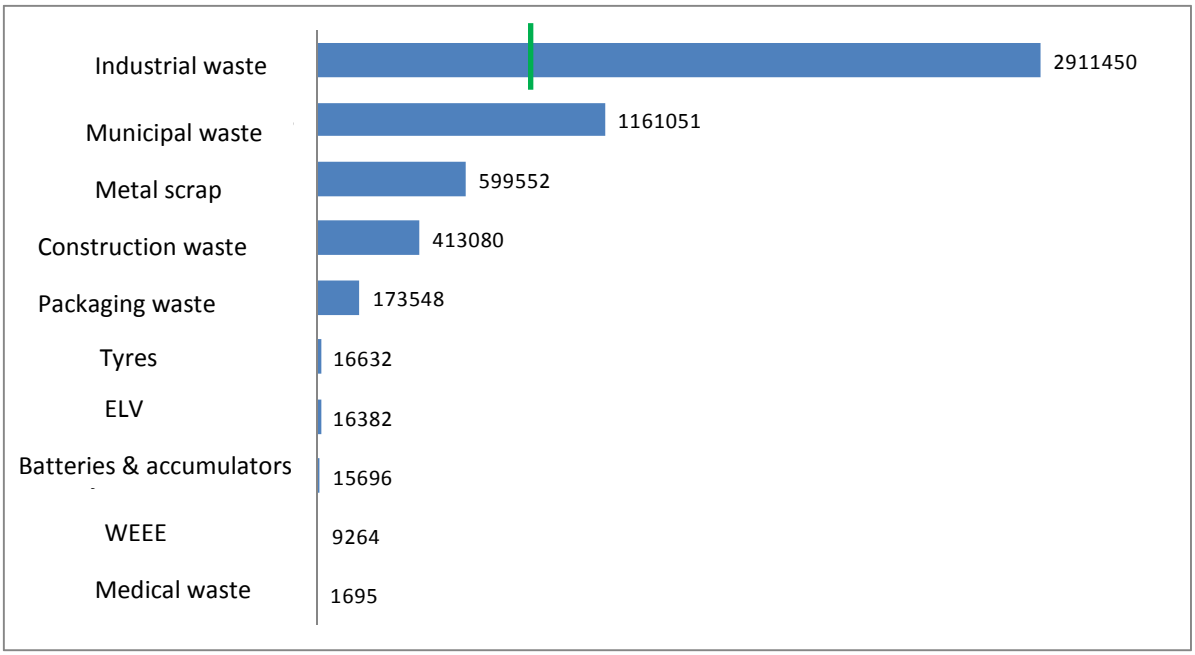


Fig. 1. Waste generation in Lithuania, tons in 2010

The availability and quality of data on municipal waste generation and composition in Lithuania is quite poor. Table 1 presents data on municipal waste generation according to the National Strategic Waste Management Plan.

Table 1. Municipal waste generation in Lithuania

	2006	2007	2008	2009
Municipal waste generation per capita, kg	392	401	408	361
Municipal waste generation, thousand tonnes	1300	1350	1400	1200

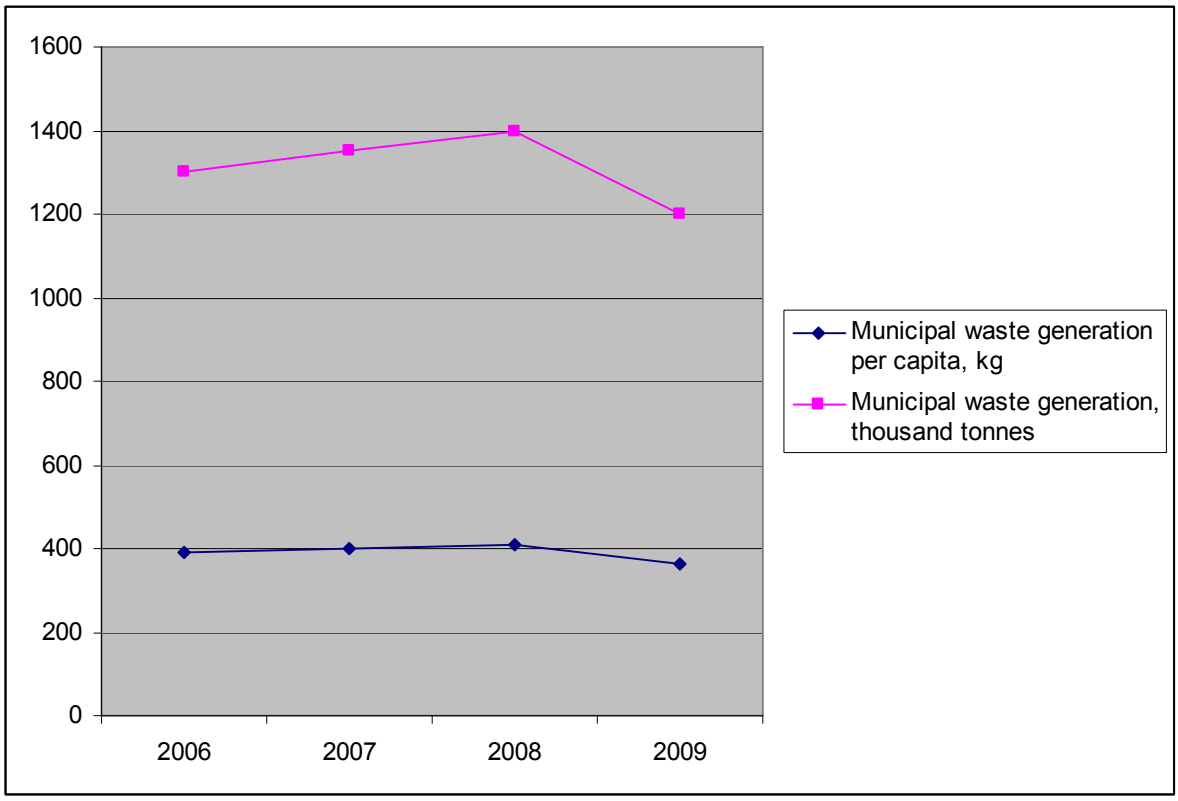


Fig. 2. *Municipal waste generation in Lithuania*

75-85 % of municipal waste is generated by households. The quantity of waste per capita in Lithuania is one of the lowest among the European Union Member States.

There were very few checks of municipal waste composition in Lithuania. Some attempts have been made by scientists from Kaunas University of Technology, COWI, maybe some others.

On 31-08-2011, Minister of the Lithuanian Ministry of Environment has issued Order No.D1-661 "Regarding the establishment of composition of mixed municipal waste, which goes to regional landfills, and estimation of biodegradable waste share". According to the Order, investigations of waste composition were started in all landfills. The checks need to be performed 4 times yearly (during each season) in 2012, 2013, 2016, 2018 and 2020. Already performed checks have revealed some unexpected results in some regions, e.g. low biodegradable waste contents in Klaipėda regional landfill. However, some experts question the reliability of these investigations due to the unclear representativeness of samples.

Certainly, there are substantial differences between municipalities, mainly towns and rural areas, also during different seasons. Table 2 presents waste composition (intervals) taken from various information sources for various regions.

Table 2. Municipal waste composition (based on various investigations and assessments 1997 - 2010)

Composition	Percentage
Organic waste (food, green waste)	25 – 55,8 %
Paper	1,1 – 19 %
Plastics	3,9 – 16,4 %

Glass	6 – 11,.3 %
Wood	0,2 – 1 %
Iron and other metals	2,2 – 3,3 %
Other flammable materials	6 – 13,8 %
Other inflammable materials	0,4 – 10 %
Hazardous waste	0,3 – 1,2 %
Other waste (including WEEE)	4,5 – 12 %
Sand and dust, sweep	18 – 40 %
Plant residues	1,1 – 2 %

2.1 Current situation - collection, recovery and disposal of municipal waste

The universal waste collection service was expanding during the last years until 94% average coverage was achieved in 2010 and 2011 (it was only 60 % in 2006). It is 98% in towns with >1000 inhabitants, and 72% in countryside.

74% of municipal waste is collected in containers, 5% - by circuit system, 2% - in collection sites of bulky waste, and 5% - by complementary private waste collection systems. There are 75 complementary private waste collection systems in Lithuania. They operate in territories of 32 municipalities. Majority of them were established to collect WEEE, but some of them are also dealing with plastic, glass, etc. There were 118 companies that provide municipal waste collection service in the beginning of 2011. In addition to that, 24 waste managers in territories of 14 municipalities acted without contracts with municipalities. Containers for separate collection of recyclables were installed in 6914 sites in the country, what results in 454 inhabitants using one site. There were 40 sites for collection of bulky waste.

Landfilling of mixed waste is still the main way to get rid of municipal waste in Lithuania. It ends-up in 11 modern regional landfills (1 in each region, except Kaunas region having 2). Dumping of waste in the old dumpsites that do not meet the established requirements was mainly stopped in 2009. According to the National Strategic Waste Management Plan, the following percentage of municipal waste went to landfills: 86% in 2006, 91,8% in 2007, 90,5% in 2008, and 90,6% in 2009. According to Eurostat data for 2009, 95% of municipal waste went to landfills, and only some 3% for recycling, and just 1% for composting.

However, composting data might be substantially higher in reality for countryside. It has traditionally been popular to compost green waste in countryside, just statistics is not able to cover and evaluate amount and percentage of this. According to expert judgement, 7400 tons of municipal biodegradable waste was composted individually. 17 composting sites function in different regions of the country for green waste (biodegradable waste from gardens, parks): 1 - in Kaunas and Šiauliai regions, 2 - in Alytus, Utena, and Tauragė regions, 4 – in Telšiai region, and 5 – in Panevėžys region. The designed capacity of these sites is 34024 tons/ year, however 12400 tons were composted in reality in 2010. Green waste was also used as structural material in composting of sewage sludge: 1400 tons were composted in this way. According to information from Association of Regional Waste Management Centres, still 621300 tons of biodegradable waste could have been deposited in landfills in 2010, what results in 84% accomplishment of the target.

Collection, preparation for recycling and recycling of secondary raw materials was developing during the last years. The collected and recycled amounts are increasing every year. More companies get involved in these activities, and their capacities are increasing. In the beginning of

2009, there were about 30 enterprises with capacity of around 150 thousand tons per year, involved in waste sorting and preparation for recycling. Paper and carton, plastic, glass and metal waste was recycled by some 40 companies, having capacity of 450 thousand tons/ year. Companies involved in waste recycling are registered in the Register of Waste Recycling Companies.

Producer responsibility principle is applied to certain products like packaging, taxable products (tyres, accumulators, batteries, oil, etc.), waste electric and electronic equipment, end-of-life vehicles, spent oil. Amendment to the Law on Environmental Charges passed in 2002 introduced product charges for packaging and some of the other mentioned products but exemption was foreseen for the producers who meet recycling targets set by the Government. Producer organisations were established to take responsibility for collection and recycling of these waste streams. These activities were expected to ensure meeting of recycling targets set in the corresponding Directives, like Packaging and Packaging Waste Directive.

2.2 Institutional framework – the role of local municipalities

It was stated in the previous National Waste Management Plan from 2002 that implementation of strict environmental requirements for waste collection, recovery and disposal is possible only if those systems are large enough to provide services to a sufficient amount of economical entities and manage a substantial amount of waste. In order to increase efficiency of the overall system, municipalities were recommended to co-operate in establishing regional waste management systems.

Thus, currently management of municipal waste is organised on the regional basis in Lithuania (Fig. 3.). There are 10 regions in total, each of them comprising several municipalities. Regional waste management centres were established during 2002-2005. Projects involving development of regional waste management systems benefited from EU Cohesion Fund allocations during the period 2000–2006.

In principle, every municipality prepares its own waste management rules and has its own waste management plan. Municipalities are responsible to organise waste management systems necessary to treat municipal waste generated in their territories. Inhabitants and enterprises that generate municipal waste are obliged to use these systems, when discarding and sorting their waste. Some of their obligations municipalities allocate to the regions. E.g. one of the main obligations is operation of landfills.

Fig. 3. Administrative structure of waste management system in Lithuania

2.3 Planned municipal waste management infrastructure

The network of containers for separate collection of recyclables, of composting sites and of sites for collection of bulky waste has not yet reached the targets set in the National Strategic Waste Management Plan, and therefore is still expanding. Additional containers for recyclables are being installed; opening of 40 new composting sites and 60 new bulky waste collection sites is foreseen. To encourage individual composting, the following number of containers will be distributed to inhabitants during the year 2012: 6000 in Alytus, 30000 in Kaunas, 10000 in Klaipėda, 6300 in Panevėžys, 38000 in Šiauliai, 600 in Tauragė, 10215 in Telšiai, 6000 in Utena, and 51000 in Vilnius regions.

The development of the overall waste management system in Lithuania from 2006 was aimed at meeting the targets of diverting biodegradable waste from landfills. Considering the current situation of municipal waste management in Lithuania, when most of waste goes to landfills, and consequently landfills are filling very fast, obligations set out by EU legislation and the National Strategic Waste Management Plan are not reached (especially for bio-waste), additional measures were necessary, and mechanical biological treatment (MBA) was considered as an acceptable solution with regard to its price and effectiveness. Thus, 9 out of 10 regions are going to have mechanical-biological treatment facilities. 1 region – Klaipėda – will have the mechanical sorting equipment. For treatment of biodegradable waste, 5 regions (Marijampolė, Alytus, Telšiai, Panevėžys and Utena) are constructing bio-gas facilities; Šiauliai and Vilnius regions are

constructing bio-drying facilities; Kaunas and Tauragė will have a production of technical compost. These plans are related to the EU structural support for 2007–2013, when investments were mainly channelled into the development of municipal biodegradable waste management infrastructure.

Incineration plants originally were planned in Vilnius, Kaunas, and Klaipėda. Construction of Fortum Klaipeda Thermofication Power Plant began in Klaipėda in 2011. It will start functioning in 2013. The plant will use waste (115-130 thousand tons of municipal, and 50 thousand tons of non hazardous industrial waste) and biomass (75 thousand tons) as a fuel; its capacity is 20 MW for electricity, and 50 MW for heat; yearly production will reach 120 GWh for electricity and 400 GWh for heat energy. Private investments into the project are 480 mln. LTL by UAB "Fortum Heat Lietuva".

The same private investor is going to invest 600 mln. LTL and to build another Thermofication Power Plant fuelled with waste and biomass in Kaunas. The planned capacity is still discussed. One of the possibilities is to incinerate 60-80% of SRF, the rest of fuel – biomass.

One more municipal waste incinerator shall be built in Vilnius. Vilnius was a front-runner, however, public opposition was very strong in that case; the process was interrupted and goes slow now. It is expected to have an incinerator in 2015 (250 thousand tons of waste / year, or 800 tons daily, with a yearly production of 500 GWh heat energy, and 130 GWh electricity).

There is also a possibility to incinerate up to 200 thousand tons/ year of SRF in Cement Kiln of Akmene from the years 2014-2015.

Table 3. Plans for MBT and WtE facilities in Lithuania

Technology	Number of projects/plants	Capacity (t/a)	Status
MBT	9 (in all regions, except Klaipėda)		Procurement procedures
Incineration	1 in Klaipeda	115-130 thsd. t municipal waste, and 50 thsd. t non hazardous industrial waste	Under construction
Incineration	1 in Kaunas	Not decided	Planned
Incineration	1 in Vilnius	Planned 250 thsd. t	Planned

2.4 Problems and obstacles of the development of municipal waste management

Although municipal waste management system is developing and undergoing various changes in Lithuania, the biggest problem is that still majority of municipal waste ends-up in landfills. Different experts list different problems for such a situation, and foresee different solutions.

Responsible institutions are not always able to fulfil their duties (lack of resources, competence, experience), there are also management problems, lack of consistency, lack of skills to act together and to co-operate with other institutions. Often solutions need to be taken quite in a hurry, what leads to mistakes. Acting in a hurry sometimes leads to bad quality results, like unreliable feasibility studies. At the same time, there are cases of unjustifiable delay.

It is still not always clear what is the borderline between municipalities and regions, why some functions can be assign to regional centres (like operating landfills), but other (like operating MBT facilities) – cannot. There is no clear agreement in the country on the role and development of regional waste management centres. Some voices say regional centres are interested to get as much as possible waste to regional landfills and to receive the money flow together, this way not being interested in converting waste from landfills. Other voices say that diverting some responsibilities from regional waste management centres will results in drastically increased prices that inhabitants have to pay for waste management.

There is no common opinion on complementary systems role: do they play a positive role by encouraging population to sort waste, or do they distort the system of collecting recyclables organised by municipalities? There are also some opinions in favour for wider application of deposit system, but it is not widely supported.

Landfill gate fee is still low in Lithuania. Although there are plans to increase the fee, the current situation does not cause an interest for other waste treatment options. Increase of price for waste management is a very sensitive issue in the country, thus it leads to the lack of political will to take decisions.

Lithuanian market is very small, thus companies providing waste treatment technologies have now a rather short momentum to enter this market, or to stay outside (due to small market there will hardly be place to enter it later). Thus, mercantile business interests in many cases stop and delay processes by suing procurement procedures to court.

Another problematic issue in many cases is public opinion. Public is against nearly any waste treatment facility in its neighbourhood, be it landfill, incinerator, or composting site. In addition, public awareness with regard to waste management is still rather low, what also leads to slow pace of development.

3. OVERVIEW OF WASTE MANAGEMENT FACILITIES IN THE COUNTRY BASED ON SURVEY OF WASTE MANAGEMENT FACILITIES

Number of waste management companies that actively participated in the survey was 39. Respondents represent the following waste management sectors (respondents could indicate more than one area):

- Waste collection – 27;
- Waste sorting - 20;
- Waste recycling - 11;
- Waste incineration – 0;
- Waste landfills – 11;
- Regional waste management (including administration) - 6.

Representation of waste management companies in terms of size was very balanced (Fig. 4). Number of employees in waste management facilities that provided responses to questionnaires is presented in the table 4.

Table 4. Number of employees in waste management facilities that participated in the survey

Number of employees	Percentage of responses
< 50	44%
50 - 100	25%
>100	31%

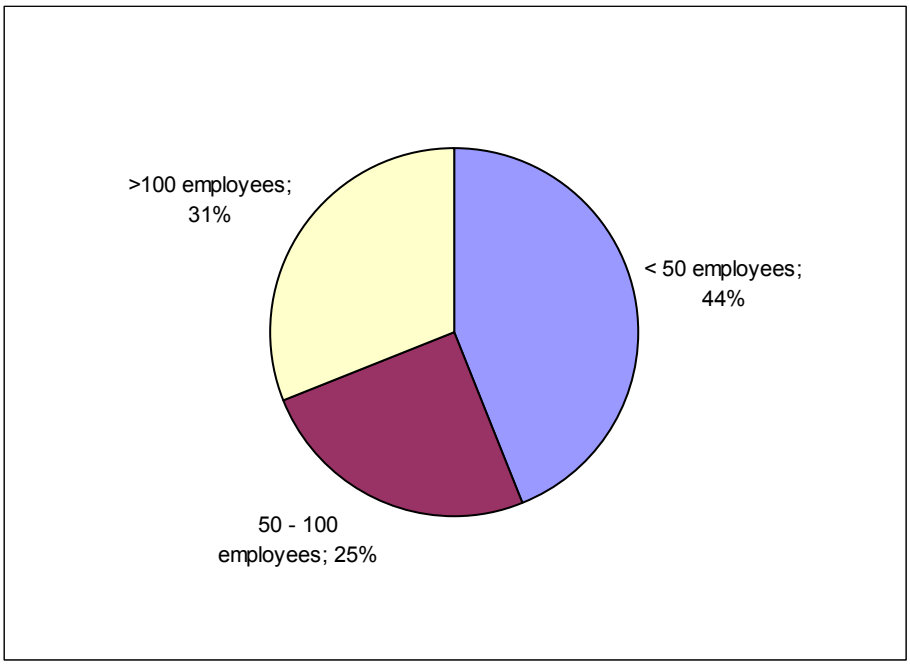


Fig. 4. Number of employees in waste management facilities that participated in the survey

4. DESCRIPTION OF HOW IMPORTANCE OF KNOWLEDGE IN DIFFERENT AREAS FOR WASTE MANAGEMENT FACILITIES' MANAGERS AND TECHNICIANS IS PERCEIVED BY DIFFERENT STAKEHOLDERS

Summarized data on opinions of different stakeholders concerning importance of particular topics is presented in the Table 5. Generally, differences in opinions of waste management facilities and authorities/ associations are small.

Table 5. Opinions of difference stakeholders on importance of particular topics in training programmes for waste management professionals

Topic	Importance	
	Waste management facilities	**Authorities and Associations**
National legal requirements concerning waste management	0% low 28% medium 72% high	0% low 10% medium 90% high
EU legal requirements concerning waste management	3% low 41% medium 56% high	6% low 47% medium 47% high
Waste management policy principles	10% low 41% medium 49% high	0% low 43% medium 57% high
Environmental Impact Assessment principles	18% low 36% medium 46% high	10% low 19% medium 71% high
Integrated Pollution Prevention and Control (IPPC) principles, including procedure for IPPC permits	13% low 28% medium 59% high	29% low 38% medium 33% high
Principles of waste classification	16% low 33% medium 51% high	9% low 34% medium 57% high
Technical requirements for equipment and technologies of waste management facility / activity in concern	18% low 33% medium 49% high	15% low 52% medium 33% high
State-of-the-art technologies in the area concerned	16% low 33% medium 51% high	9% low 14% medium 67% high
National requirements for waste management procedures (licensing, waste accounting, reporting, etc.)	8% low 28% medium 64% high	5% low 33% medium 62% high
Principles of emergency planning and response measures	16% low 38% medium 46% high	9% low 39% medium 52% high
Monitoring requirements	13% low 46% medium 41% high	5% low 52% medium 43% high
Waste/ pollution prevention principles	13% low 41% medium 46% high	5% low 38% medium 57% high

Product life cycle principles	38% low 38% medium 24% high	25% low 67% medium 9% high
Principles of environmental management system/ environmental risk management	24% low 51% medium 25% high	38% low 57% medium 5% high
Principles of environmental management accounting	15% low 55% medium 30% high	29% low 71% medium 0% high
Corporate social responsibility principles	15% low 56% medium 29% high	28% low 44% medium 28% high
Principles of business/ corporate organisation and management	20% low 54% medium 26% high	24% low 71% medium 5% high

The topics identifies as most important by waste management facilities' representatives are the following:

- National legal requirements concerning waste management;
- EU legal requirements concerning waste management;
- Waste management policy principles;
- Integrated Pollution Prevention and Control (IPPC) principles, including procedure for IPPC permits;
- Technical requirements for equipment and technologies of waste management facility / activity in concern;
- State-of-the-art technologies in the area concerned;
- National requirements for waste management procedures (licensing, waste accounting, reporting, etc.).

Ranking of importance of these particular topics is presented in the Fig 5.

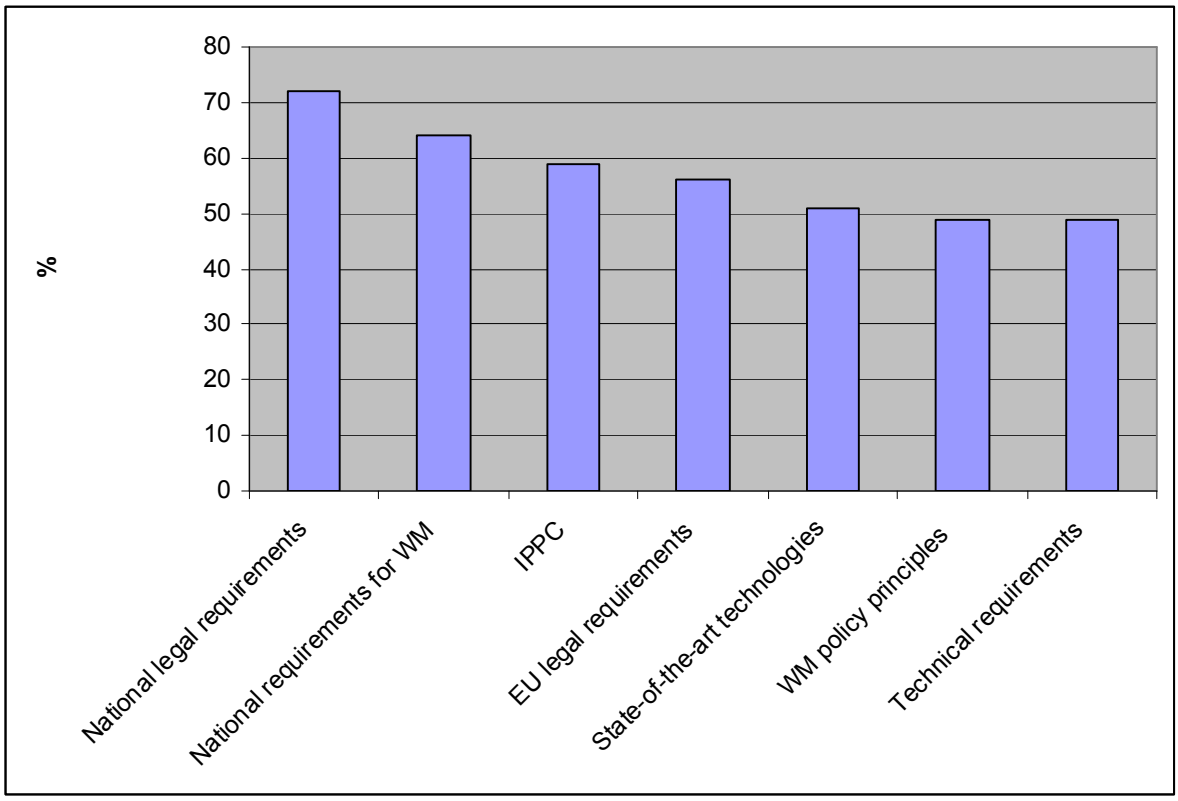


Fig. 5. Seven topics of highest importance in the opinion of waste management facilities

5. CURRENT QUALIFICATION OF SOLID WASTE FACILITY MANAGERS AND SPECIALISTS IN PARTICULAR AREAS BASED ON OPINIONS OF DIFFERENT STAKEHOLDERS COLLECTED DURING SURVEY

Quantitative data on opinions of different stakeholders concerning current knowledge of waste management professionals in particular areas is presented in the Table 6.

Table 6. Current knowledge/ skills of waste management professionals in Lithuania

Topic	Current knowledge/ skills among waste management facilities' professionals	
	Waste management facilities	Authorities and associations
National legal requirements concerning waste management	8% low 74% medium 18% high	0% low 47% medium 53% high
EU legal requirements concerning waste management	15% low 54% medium 31% high	24% low 67% medium 9% high
Waste management policy principles	10% low 76% medium 12% high	5% low 71% medium 24% high
Environmental Impact Assessment principles	26% low 61% medium 13% high	9% low 62% medium 29% high
Integrated Pollution Prevention and Control (IPPC) principles, including procedure for IPPC permits	10% low 59% medium 31% high	29% low 47% medium 24% high
Principles of waste classification	3% low 64% medium 33% high	9% low 67% medium 24% high
Technical requirements for equipment and technologies of waste management facility / activity in concern	18% low 59% medium 23% high	9% low 67% medium 24% high
State-of-the-art technologies in the area concerned	38% low 49% medium 13% high	43% low 52% medium 5% high
National requirements for waste management procedures (licensing, waste accounting, reporting, etc.)	8% low 59% medium 33% high	9% low 57% medium 34% high
Principles of emergency planning and response measures	18% low 61% medium 21% high	39% low 52% medium 9% high
Monitoring requirements	21% low 61% medium 18% high	8% low 74% medium 18% high
Waste/ pollution prevention principles	18% low 67% medium 15% high	9% low 67% medium 24% high

Product life cycle principles	41% low 56% medium 3% high	57% low 43% medium 0% high
Principles of environmental management system/ environmental risk management	28% low 61% medium 11% high	57% low 38% medium 5% high
Principles of environmental management accounting	21% low 64% medium 15% high	57% low 43% medium 0% high
Corporate social responsibility principles	29% low 56% medium 15% high	57% low 43% medium 0% high
Principles of business/ corporate organisation and management	20% low 72% medium 8% high	19% low 81% medium 0% high

In opinion of the survey respondents, the areas that waste management professionals are least knowledgeable are the following:

- Environmental Impact Assessment principles;
- State-of-the-art technologies in the area concerned;
- Monitoring requirements;
- Product life cycle principles;
- Principles of environmental management system/ environmental risk management;
- Principles of environmental management accounting;
- Corporate social responsibility principles.

Ranking of the current knowledge level is presented in the Fig. 6. According to the survey results, it could be concluded that knowledge/ qualification of waste management professionals in Lithuania in the areas identified as most important is at least at medium level. For example, in opinion of both waste management facilities and authorities/ associations, the topic national legal requirements concerning waste management is high, but current knowledge in this area ids medium.

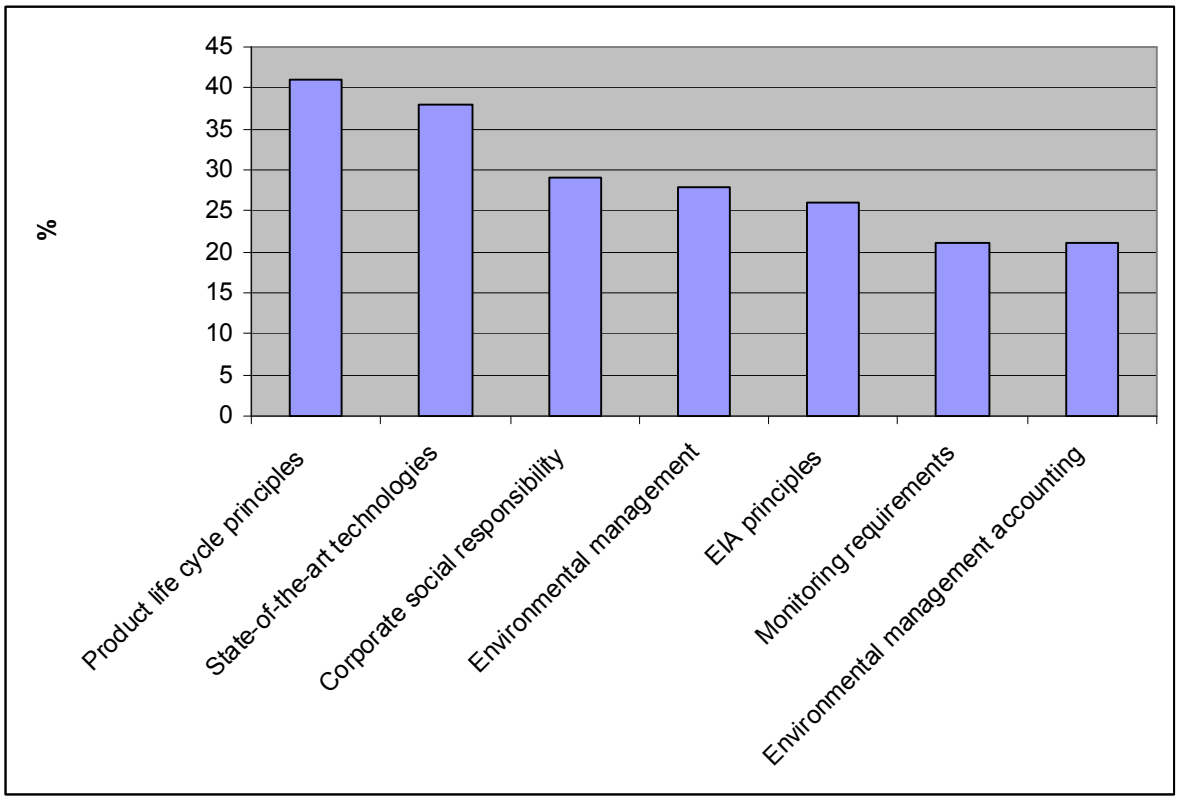


Fig. 6. Topics in which waste management facilities' professionals have low qualifications in their own opinion

5.1 National legal requirements concerning waste management

Importance of national legal requirements concerning waste management has been highlighted by both waste management facilities and authorities/ associations (Fig. 7). Current knowledge in opinion of respondents from waste management facilities is medium (more than 70% respondents). Authorities and associations current knowledge of waste management professionals evaluate even better – more than 50% of respondents indicated that current knowledge is high.

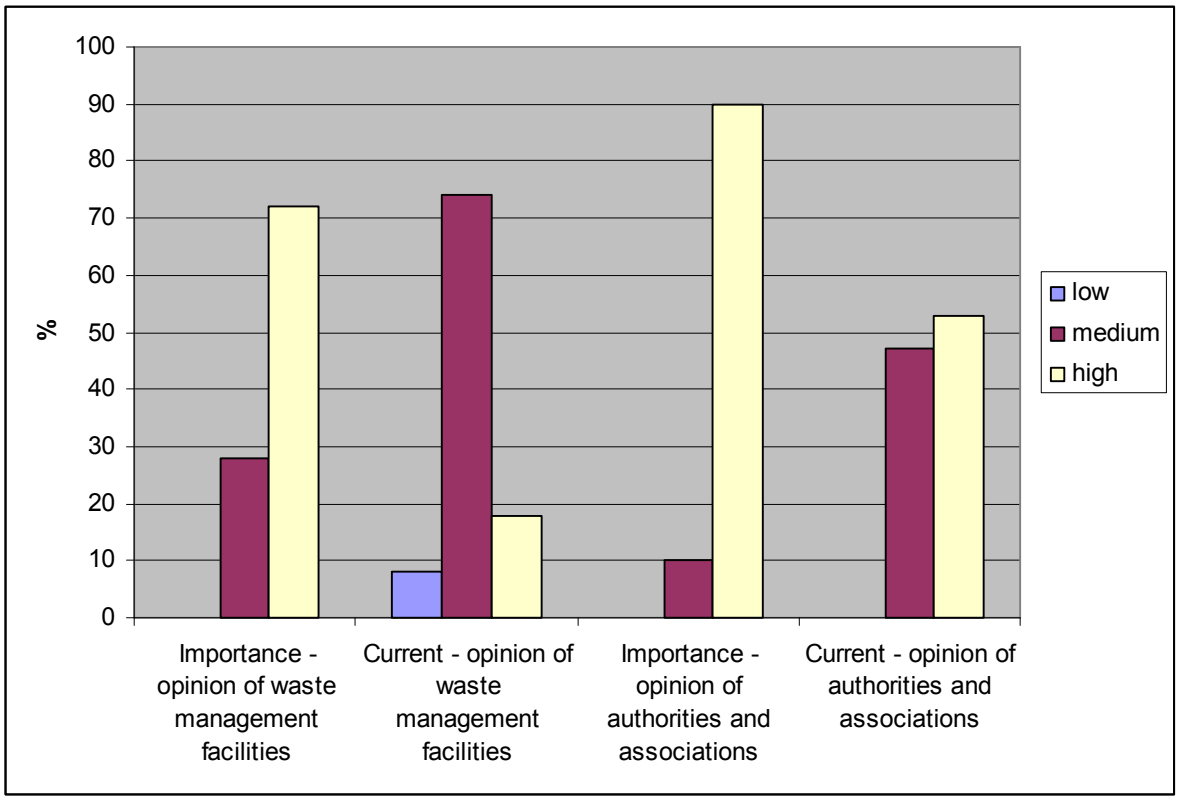


Fig. 7. Knowledge/ skills of waste management professionals in the area of national legal requirements concerning waste management

5.2 EU legal requirements concerning waste management

In the area of EU legal requirements concerning waste management, importance is ranked slightly lower, but current knowledge is generally evaluated as medium (Fig. 8). Waste management facilities rank importance of EU legal requirements slightly higher than authorities associations, but this difference in opinions has little meaning as Lithuanian legal requirements concerning waste management are in principle in line with EU legal requirements.

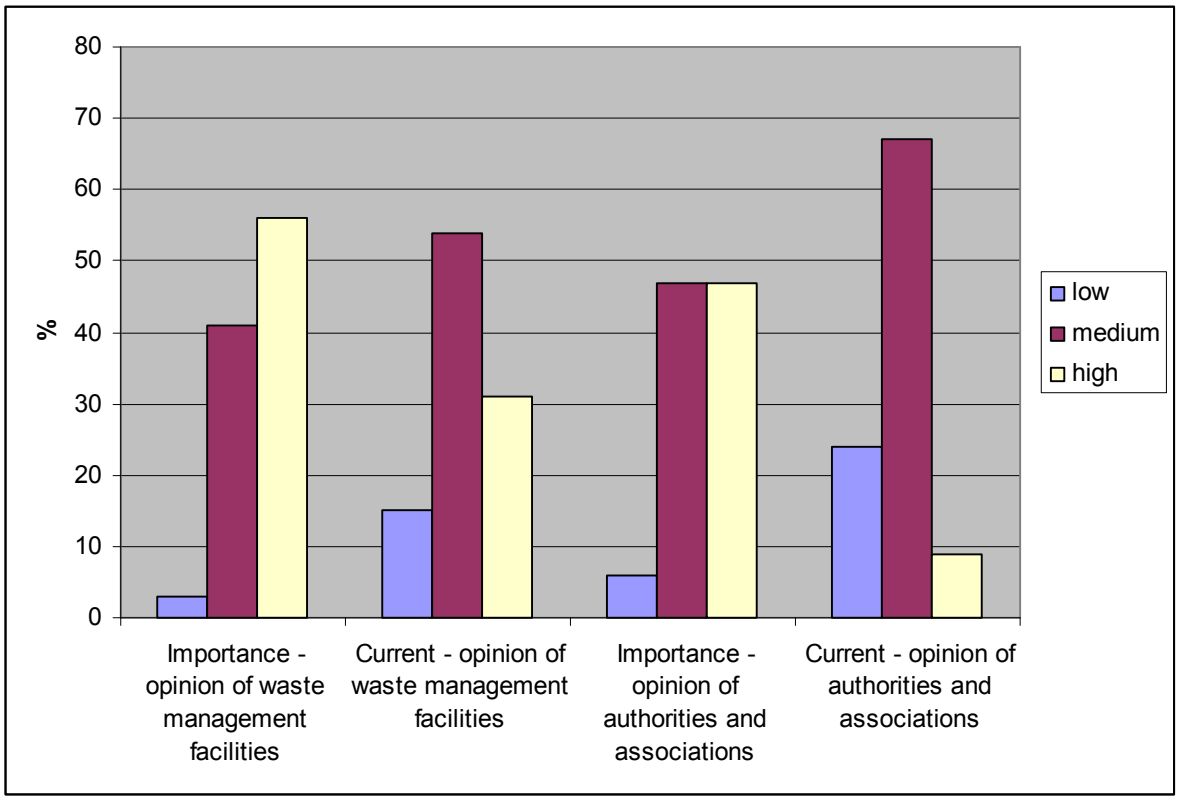


Fig. 8. Knowledge/ skills of waste management professionals in the area of EU legal requirements concerning waste management

5.3 Waste management policy principles

Importance of waste management principles is ranked not as high as national legal requirements by the survey respondents, but gap between importance and level of current knowledge is significant (Fig. 9).

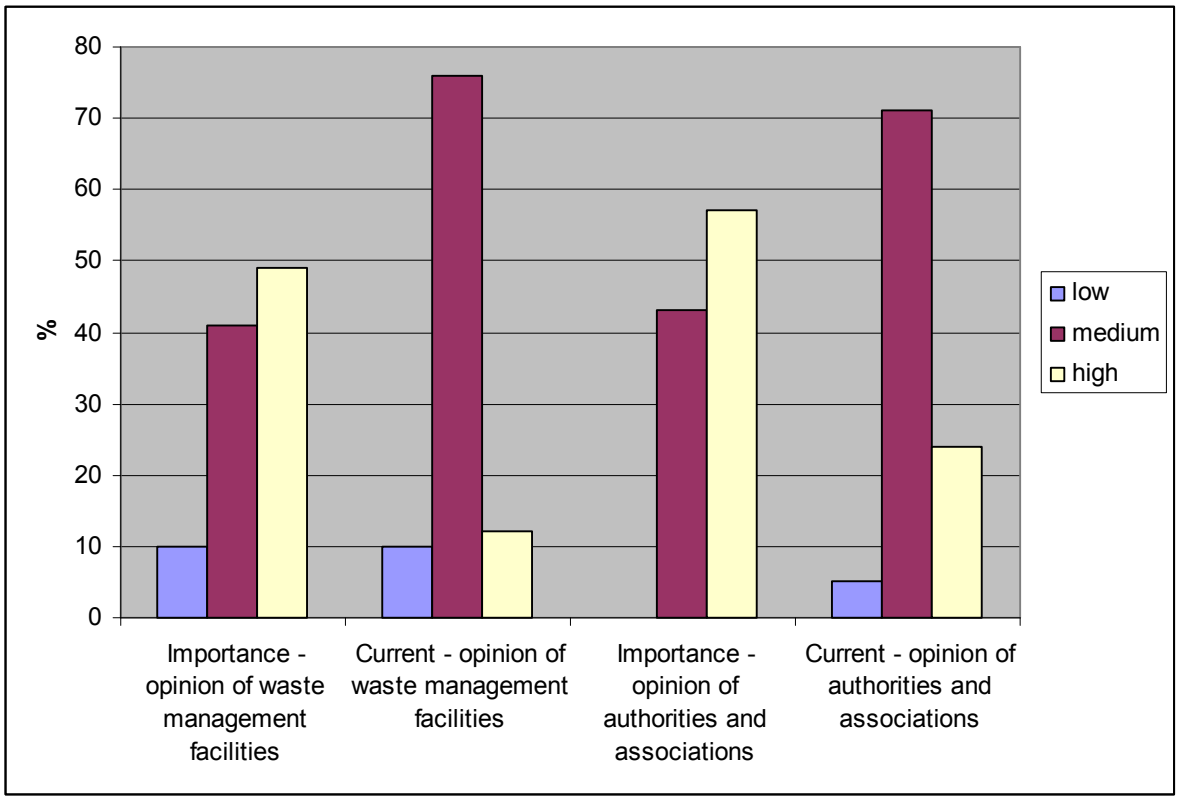


Fig. 9. Knowledge/ skills of waste management professionals in the area of waste management policy

5.4 Environmental Impact Assessment principles

In terms of environmental impact assessment principles, higher importance is seen by authorities and associations (Fig. 10.). As in previous cases, general opinion is that current knowledge is medium.

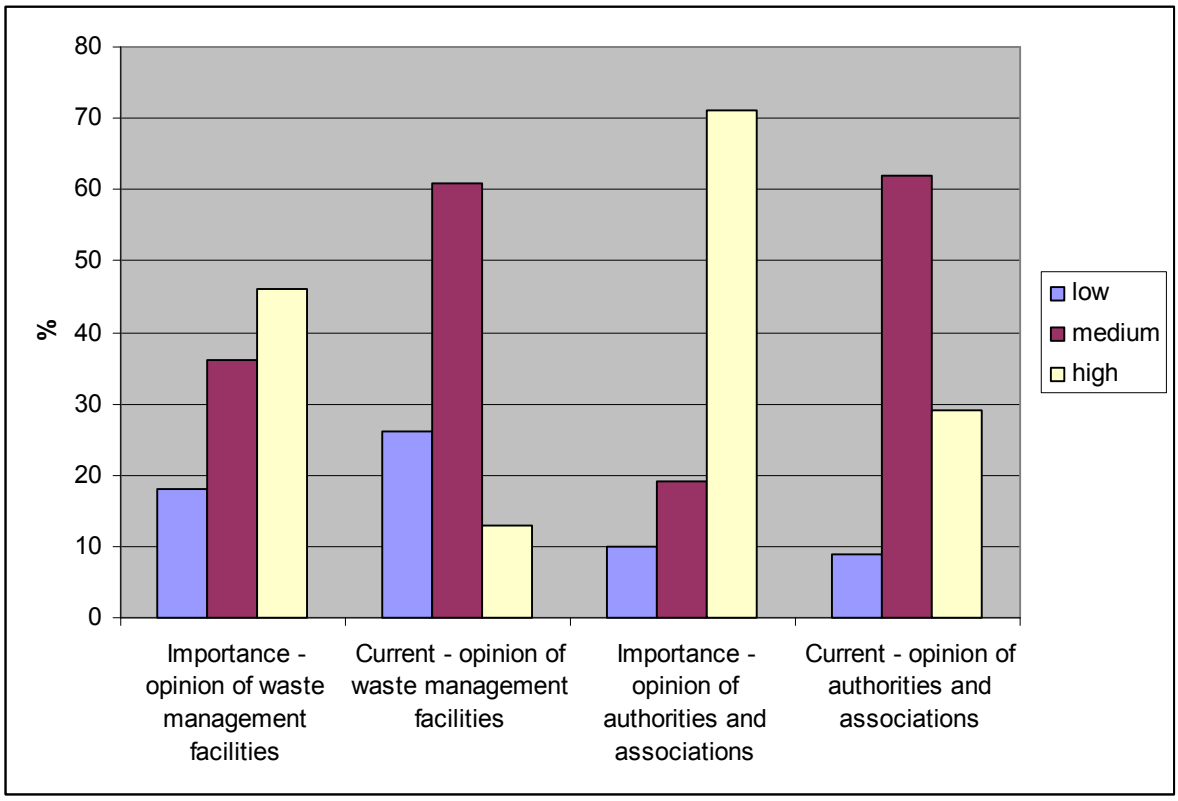


Fig. 10. Knowledge/ skills of waste management professionals in the area of EIA

5.5 Integrated Pollution Prevention and Control (IPPC) principles, including procedure for IPPC permits

Integrated pollution prevention and control principles are ranked as important by majority of waste management facilities (almost 60 %) and almost twice higher than by respondents from authorities and associations (Fig. 11). Current level of knowledge – medium.

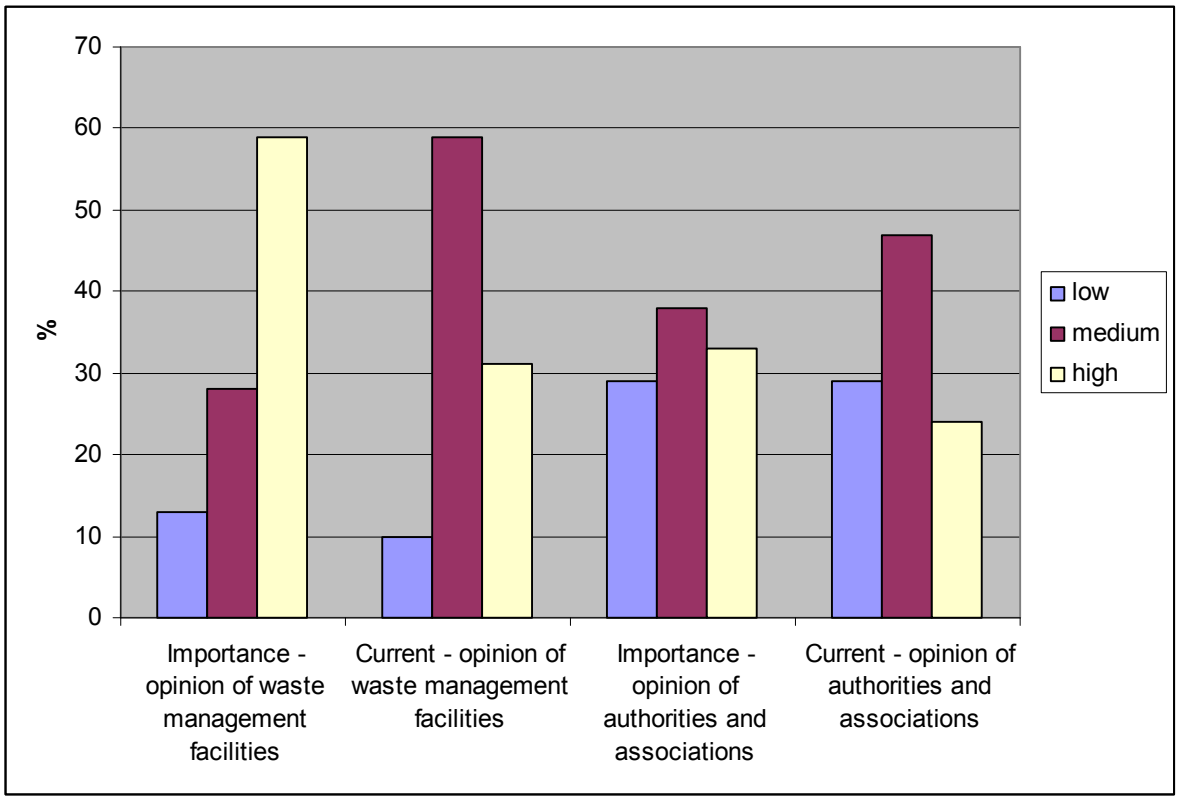


Fig. 11. Knowledge/ skills of waste management professionals in the area of IPPC

5.6 Principles of waste classification

Importance of waste classification principles is ranked as high by more than 50% of waste management facilities and almost 60% of authorities/ associations (Fig. 12). General consensus concerning current level of knowledge – medium.

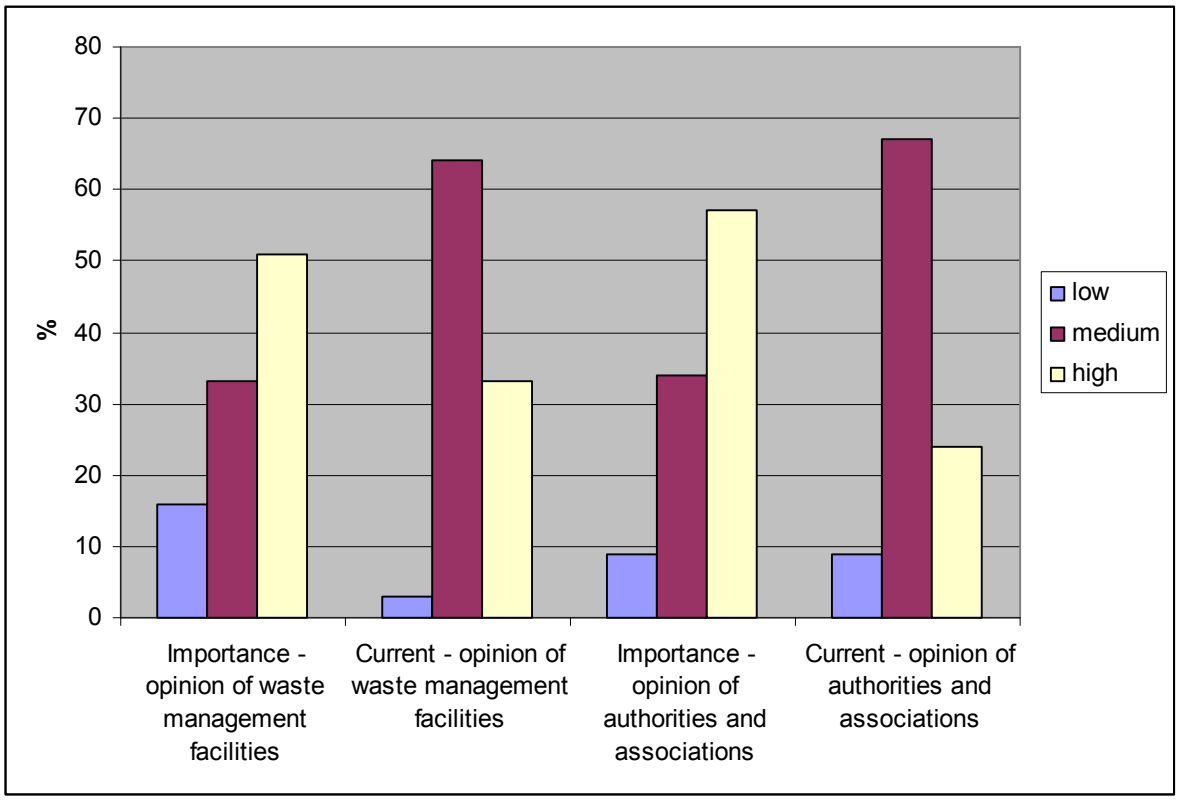


Fig. 12. Knowledge/ skills of waste management professionals in the area of waste classification

5.7 Technical requirements for equipment and technologies of waste management facility / activity in concern

Opinion of waste management facilities and authorities/ associations concerning technical requirements for waste management equipment and technologies is very similar to the opinion concerning waste classification principles (Fig. 13). However, in opinion of authorities and associations, importance in this case is lower.

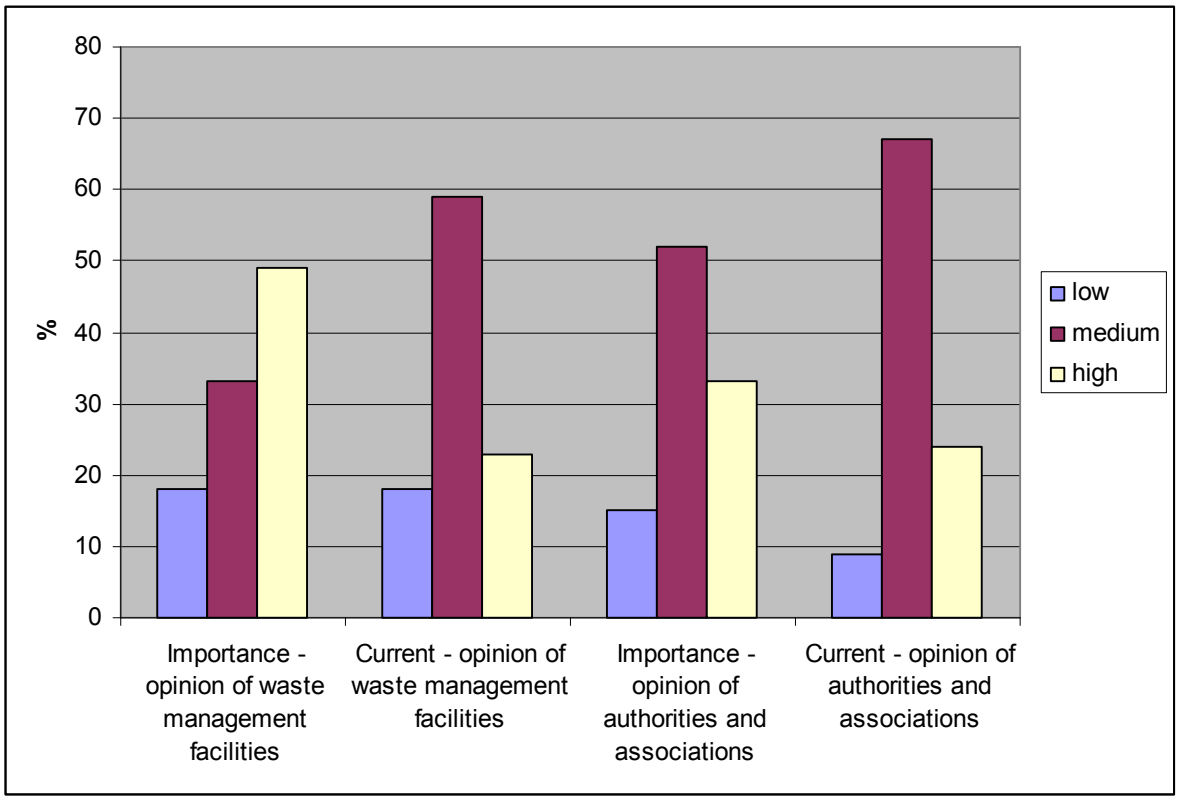


Fig. 13. Knowledge/ skills of waste management professionals concerning technical requirements for waste treatment equipment and technologies

5.8 State-of-the-art technologies in the area concerned

Importance of state-of-the-art technologies is ranked very high by both waste management facilities and authorities/ associations (Fig. 14.). Current knowledge is low to medium.

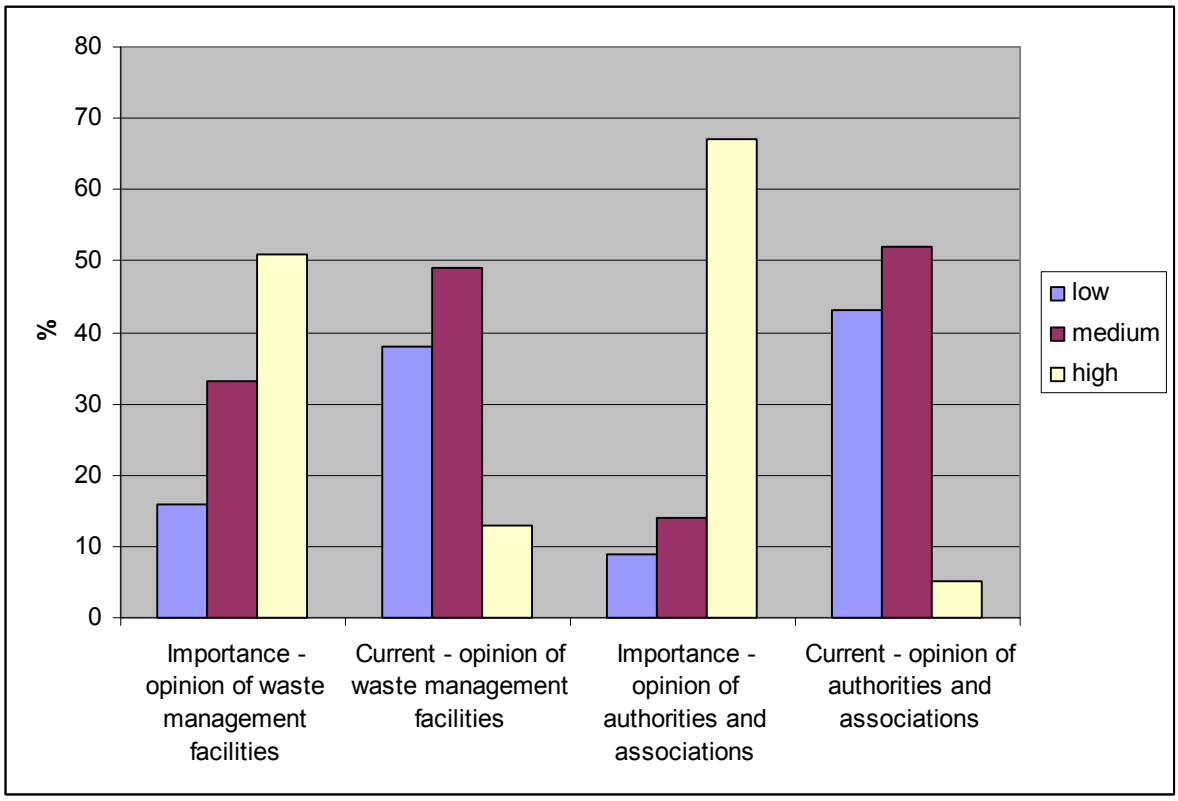


Fig. 14 Knowledge/ skills of waste management professionals concerning state-of-the-art technologies

5.9 National requirements for waste management procedures (licensing, waste accounting, reporting, etc.)

Importance of national requirements for waste management procedures is ranked very high by both waste management facilities and authorities/ associations (Fig. 14.). Current knowledge is medium.

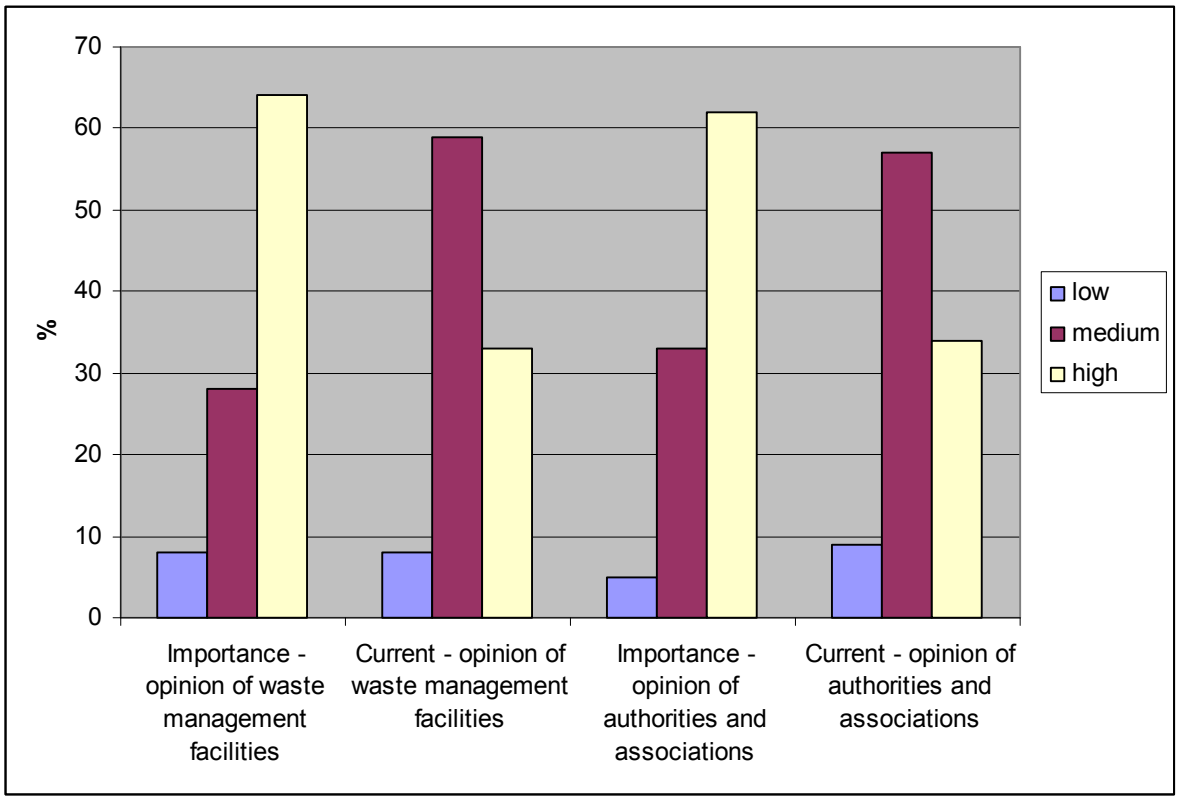


Fig. 15. Knowledge/ skills of waste management professionals concerning national requirements for waste management procedures

5.10 Principles of emergency planning and response measures

Principles of emergency planning and response measures are ranked by the survey respondents from medium to high (Fig. 16). As in all previous cases, current knowledge is evaluated as being medium at the best.

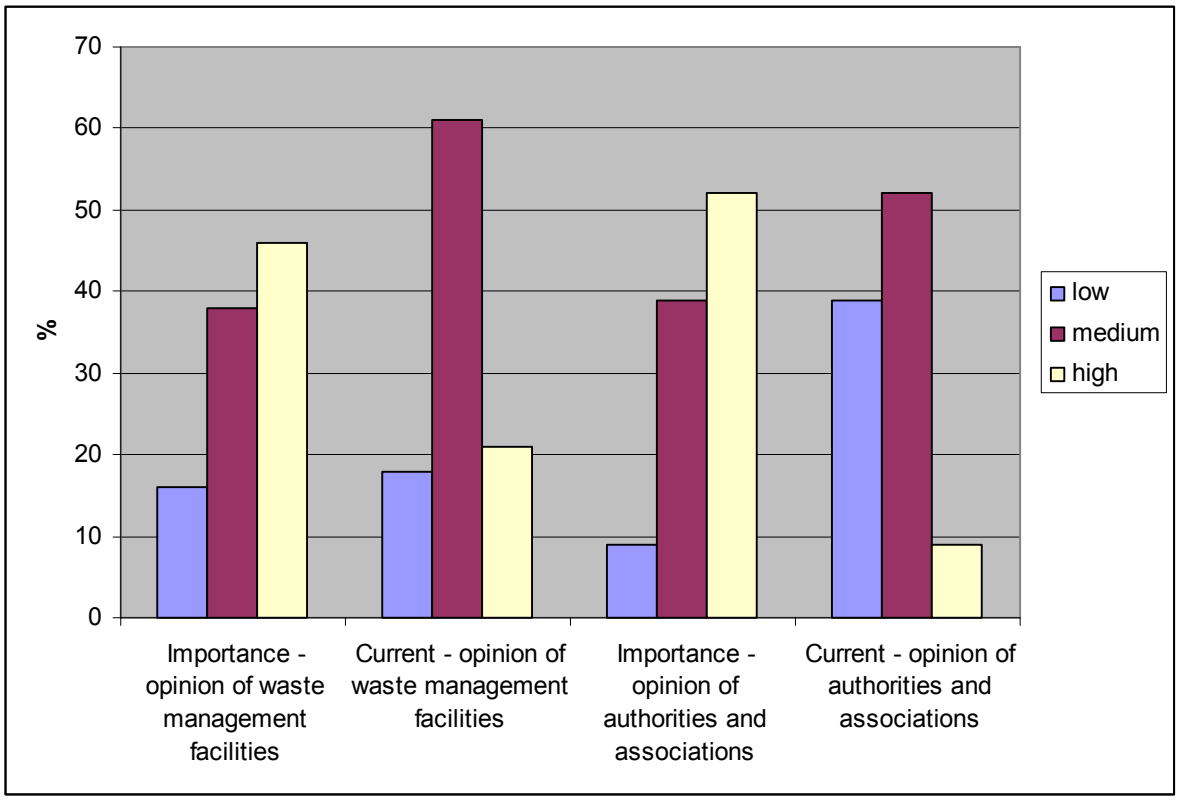


Fig. 16. Knowledge/ skills of waste management professionals concerning emergency planning and response measures

5.11 Monitoring requirements

As to monitoring requirements, waste management facilities and authorities/ associations believe that importance of this topic is rather medium than high (although by a small margin) (Fig. 17). There is a consensus among the survey respondents that current knowledge is at medium level.

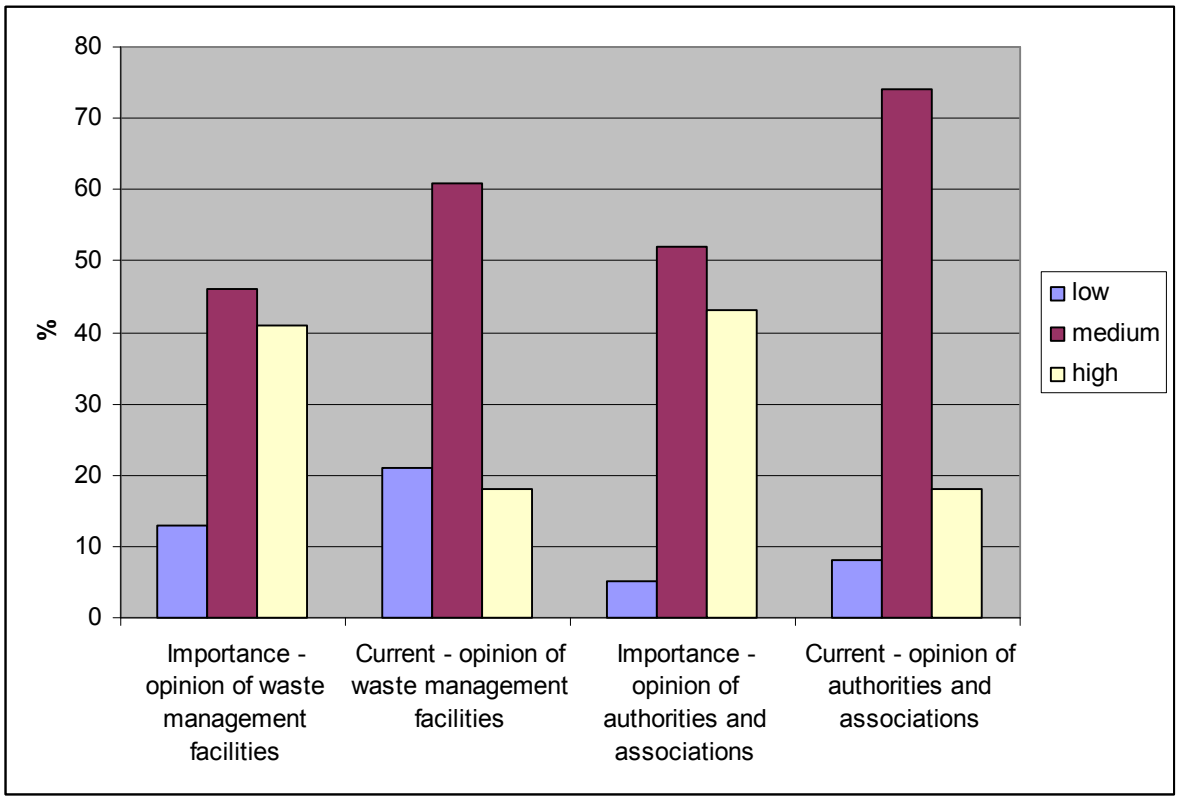


Fig. 17. Knowledge/ skills of waste management professionals concerning monitoring requirements

5.12 Waste/ pollution prevention principles

Importance of waste/ pollution prevention principles is ranked at medium to high level, but higher ranking is given by authorities/ associations (Fig. 18). Current knowledge is medium.

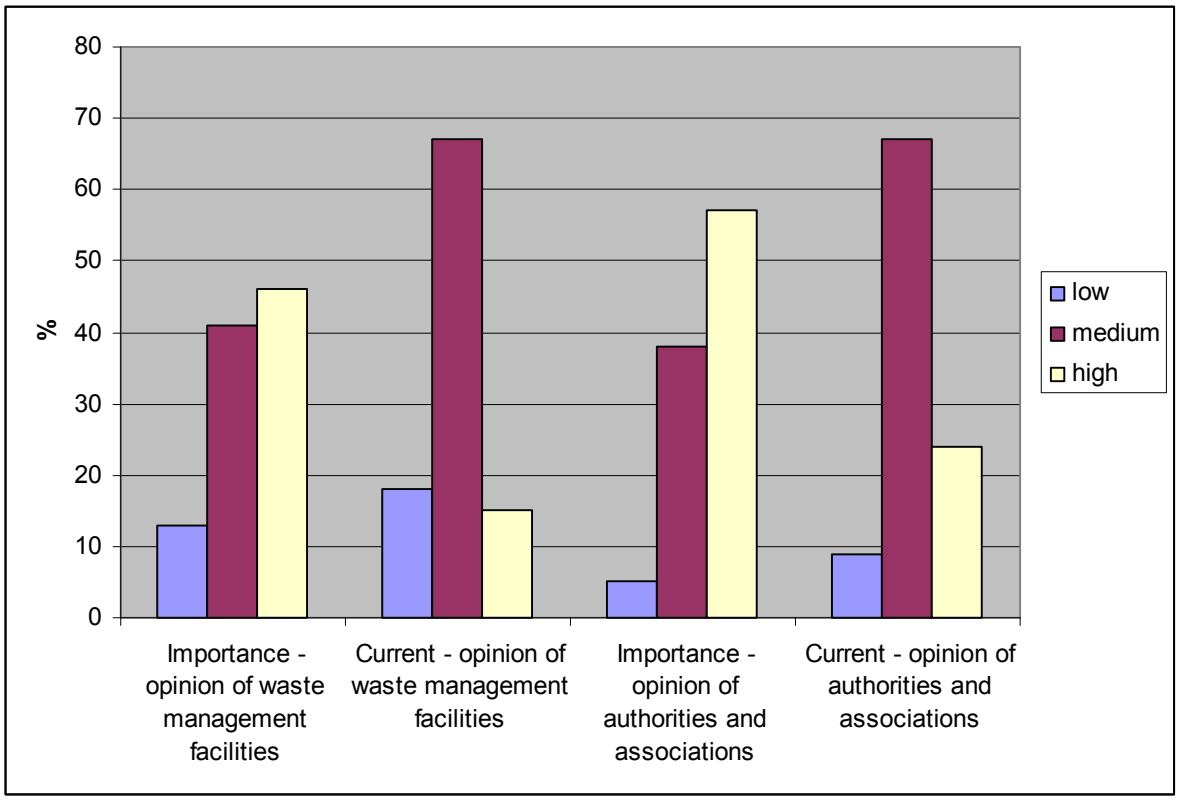


Fig. 18. Knowledge/ skills of waste management professionals concerning waste/ pollution prevention

5.13 Product life cycle principles

Importance of product life cycle principles in the opinion of the survey respondents is significantly lower than other topics (Fig. 19.). Current knowledge – low to medium.

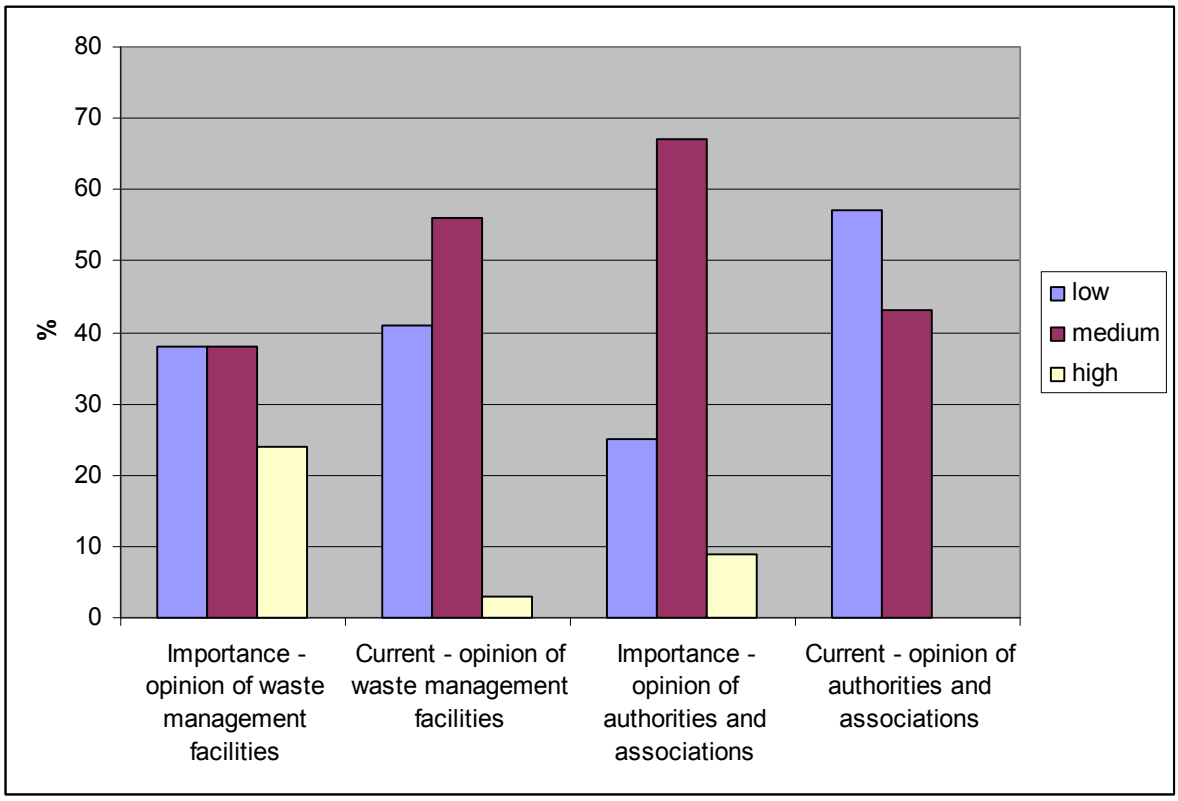


Fig. 19. Knowledge/ skills of waste management professionals concerning product life-cycle principles

5.14 Principles of environmental management system/ environmental risk management

Similarly to product life cycle principles, importance of environmental management principles is seen by the survey respondents as low to medium (Fig. 20). This corresponds to the opinions concerning current knowledge, which is also low to medium.

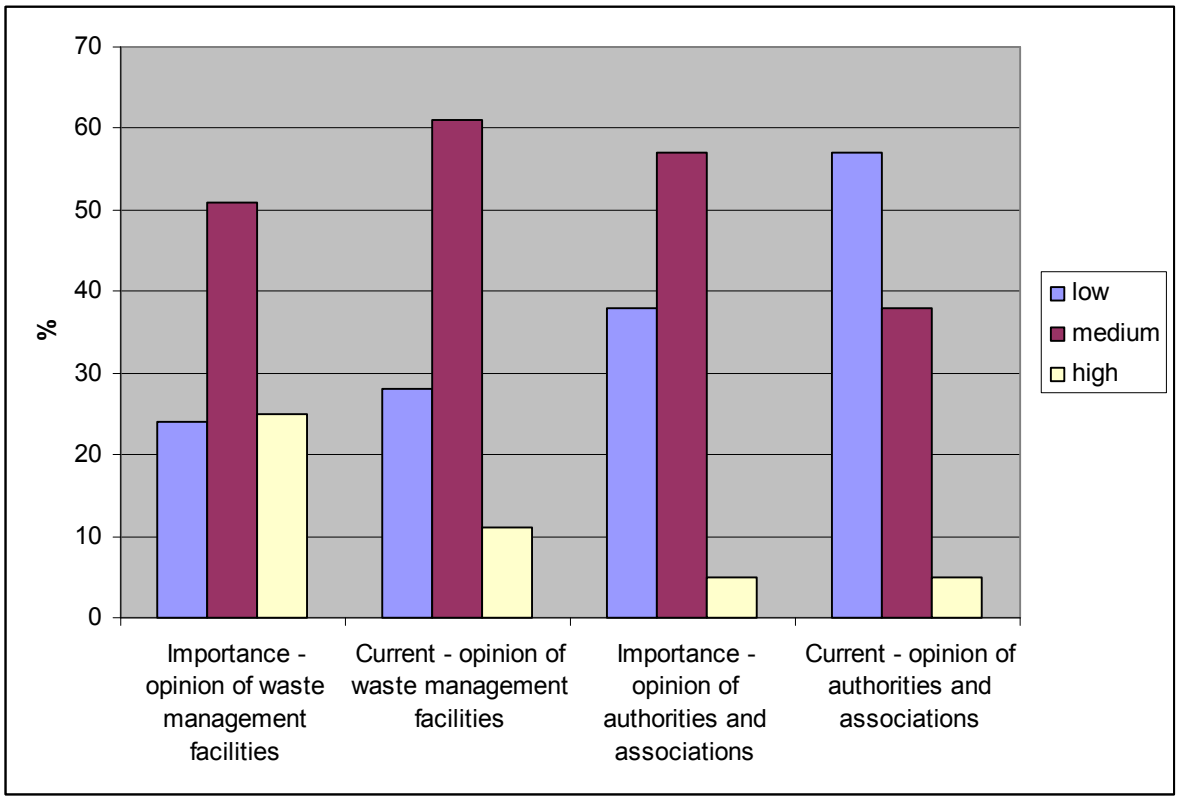


Fig. 20. Knowledge/ skills of waste management professionals concerning environmental management principles

5.15 Principles of environmental management accounting

Opinions of the survey respondents concerning waste management accounting principles are almost identical to the opinions that concern environmental management principles (Fig. 21).

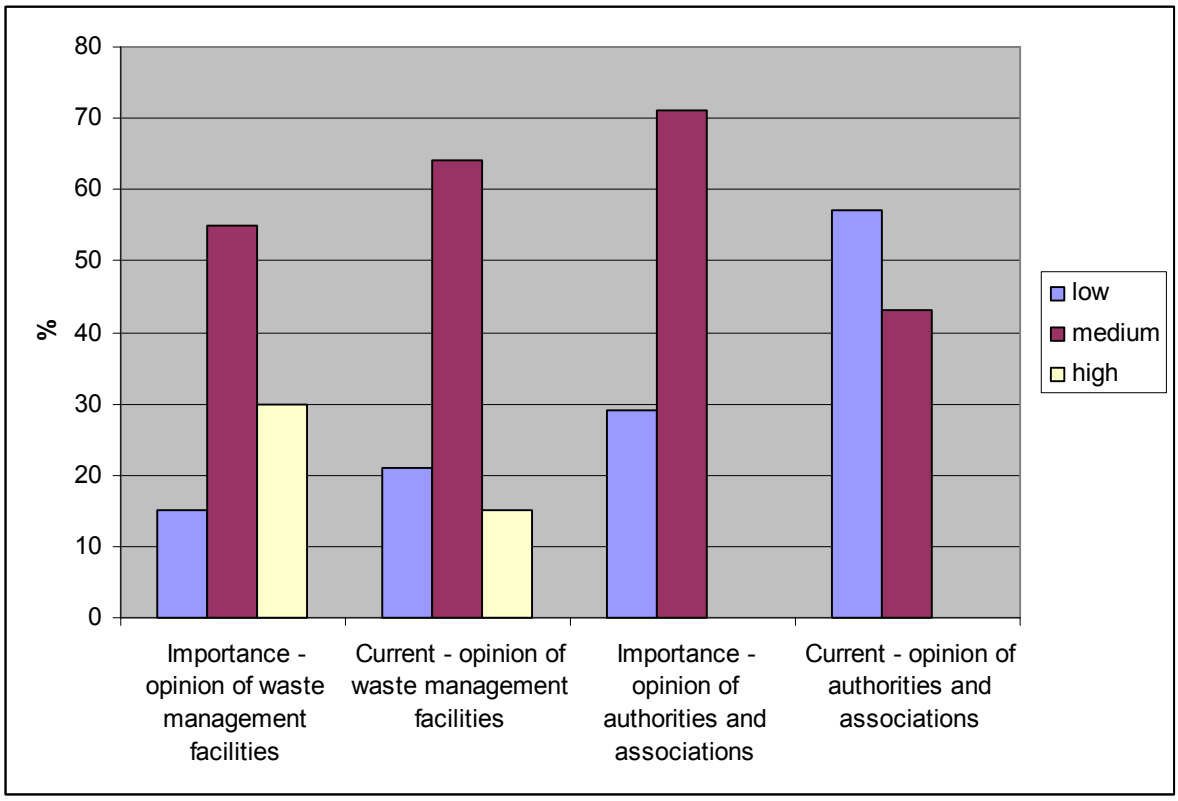


Fig. 21. Knowledge/ skills of waste management professionals concerning environmental management accounting principles

5.16 Corporate social responsibility

Principles of corporate social responsibility are seen as slightly more important than environmental management principles by authorities and associations (Fig. 22). Current knowledge – low to medium.

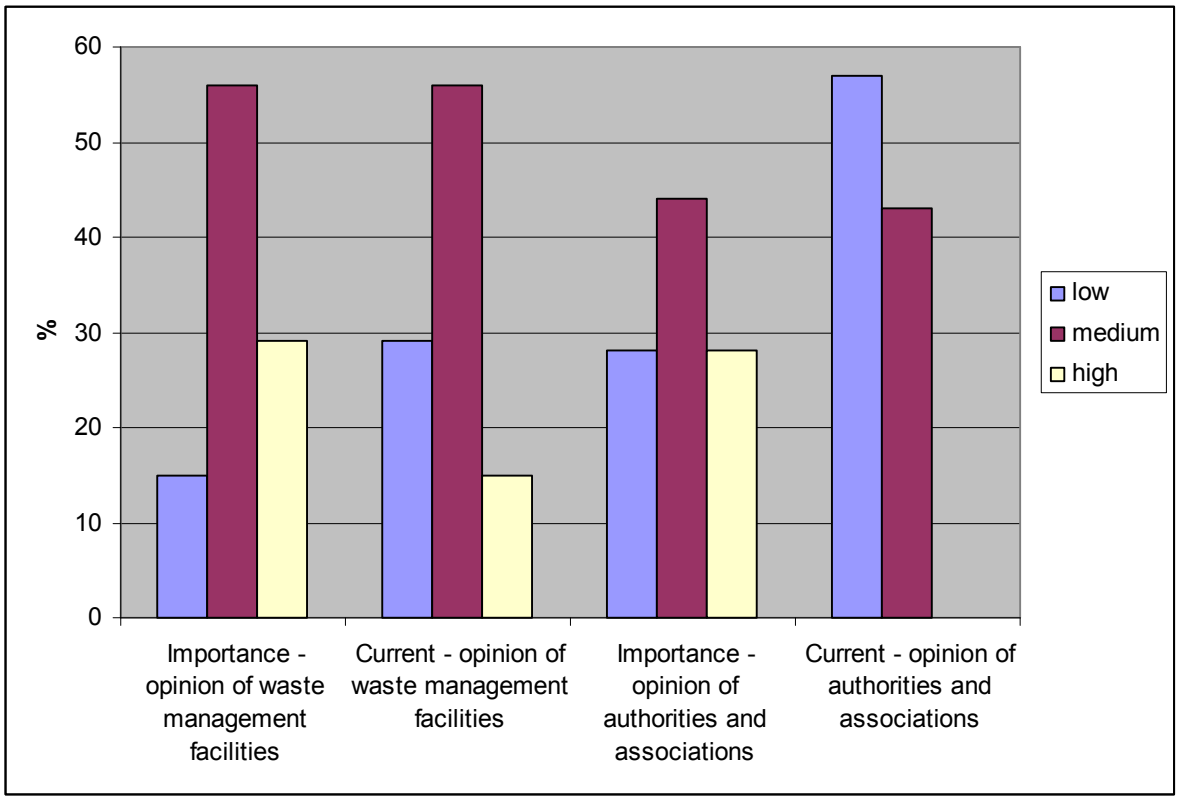


Fig. 22. Knowledge/ skills of waste management professionals in the area of corporate social responsibility

5.17 Principles of business/ corporate organisation and management

There is a general consensus among the survey respondents that importance and current knowledge of waste management professionals in the area of business/ corporate organisation and management is medium (Fig. 23).

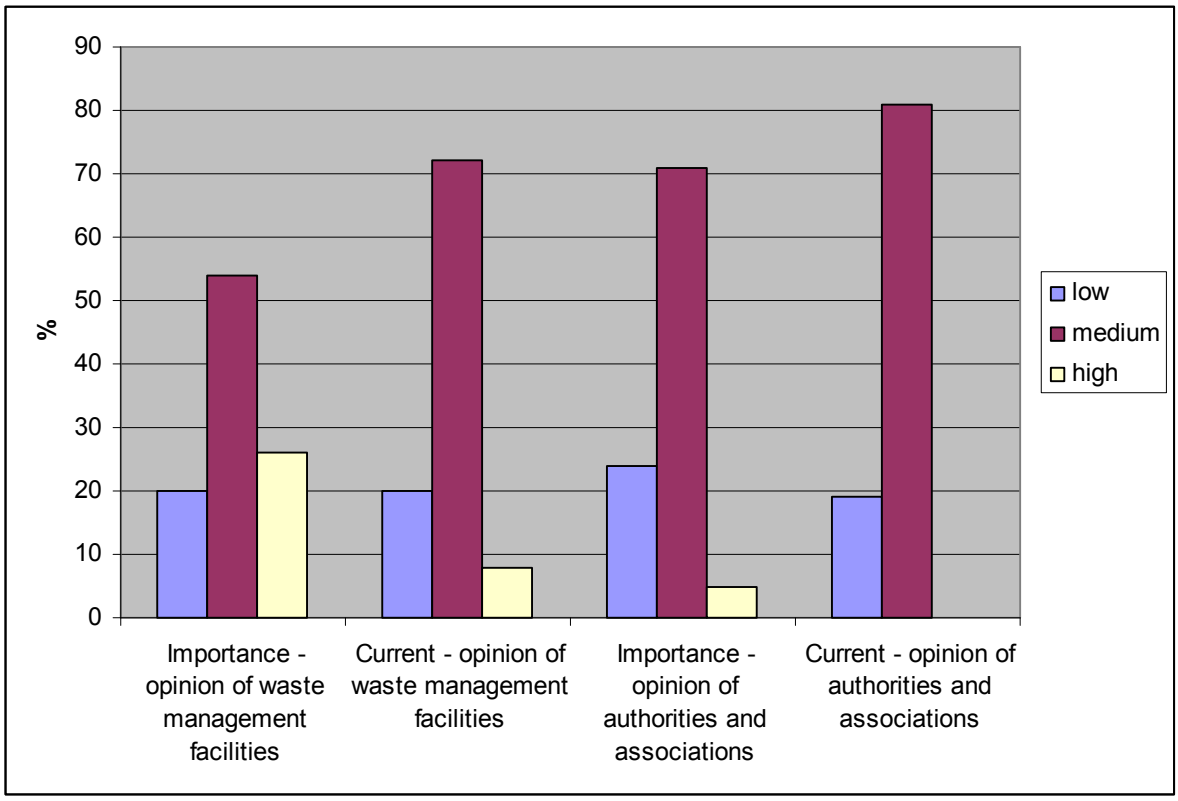


Fig. 23. Knowledge/ skills of waste management professionals in the area of business/ corporate management

6. DESCRIPTION OF HOW IMPORTANCE OF PRACTICAL SKILLS IN PARTICULAR AREAS FOR WASTE MANAGEMENT FACILITIES' MANAGERS AND SPECIALISTS IS PERCEIVED BY DIFFERENT STAKEHOLDERS

Quantitative data on opinions of different stakeholders concerning practical skills in particular areas is summarised in the Table 7.

Table 7. Opinion of different stakeholders on importance of particular practical skills for waste management professionals

	Importance	
Topic	**Waste management facilities**	**Authorities and Associations**
Waste management procedures in the area concerned	3% low 28% medium 69% high	0% low 19% medium 81% high
Environmental management procedures	13% low 82% medium 5% high	14% low 67% medium 19% high
Health and safety procedures	7% low 26% medium 67% high	14% low 43% medium 43% high
Waste minimisation methodology	8% low 51% medium 41% high	20% low 28% medium 52% high
Life cycle assessment methodology	28% low 54% medium 18% high	19% low 81% medium 0% high
Environmental Impact Assessment methodology	10% low 54% medium 36% high	10% low 38% medium 52% high
Development of IPPC permit application	4% low 48% medium 48% high	29% low 33% medium 38% high

In opinion of waste management facilities most important practical skills for waste management professionals are in the following (Fig. 24):

1. Waste management;
2. Health and safety; and
3. IPPC permit application development;

Areas of medium importance include:

1. Environmental management;
2. Life cycle assessment;
3. Environmental impact assessment; and
4. Waste minimisation.

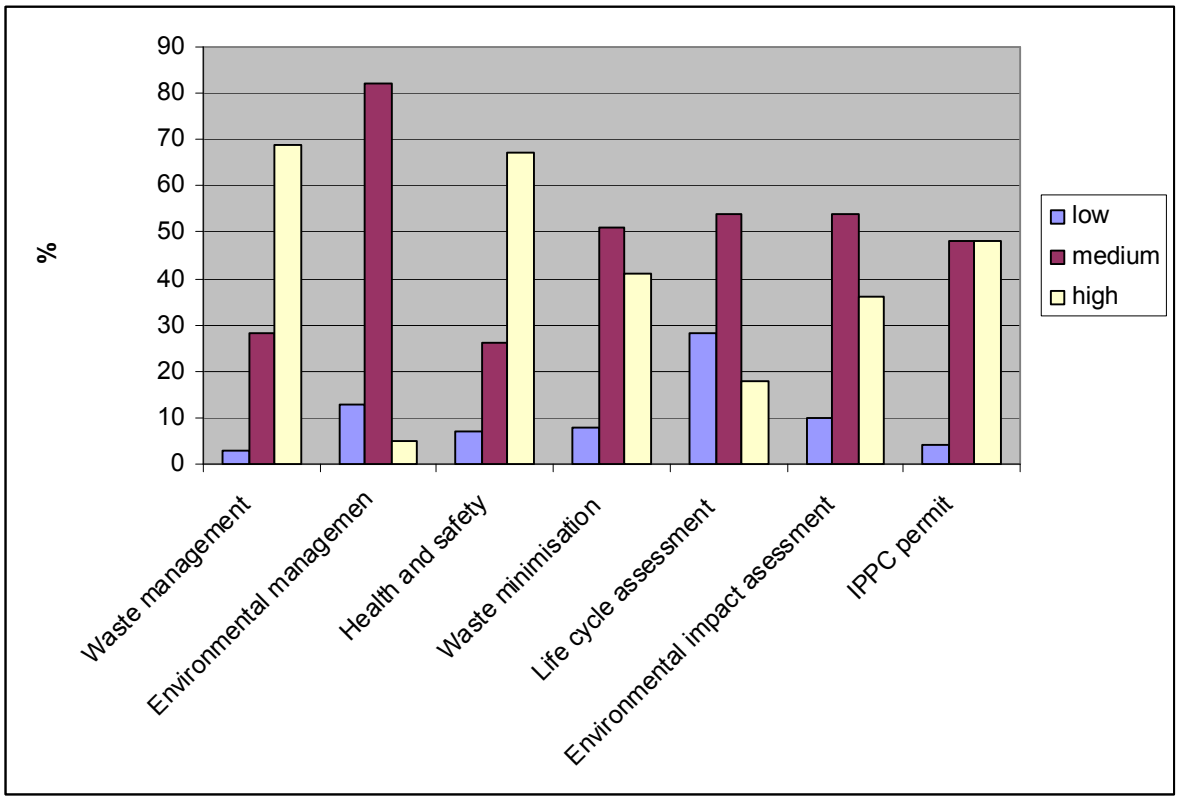


Fig. 24. Importance of practical skills for waste management facilities' professionals – opinion of waste management facilities

In opinion of authorities associations, the most important areas are:

1. Waste management;
2. Waste minimisation;
3. Environmental impact assessment; and
4. IPPC permit application development.

Areas of medium importance are life cycle assessment and environmental management.

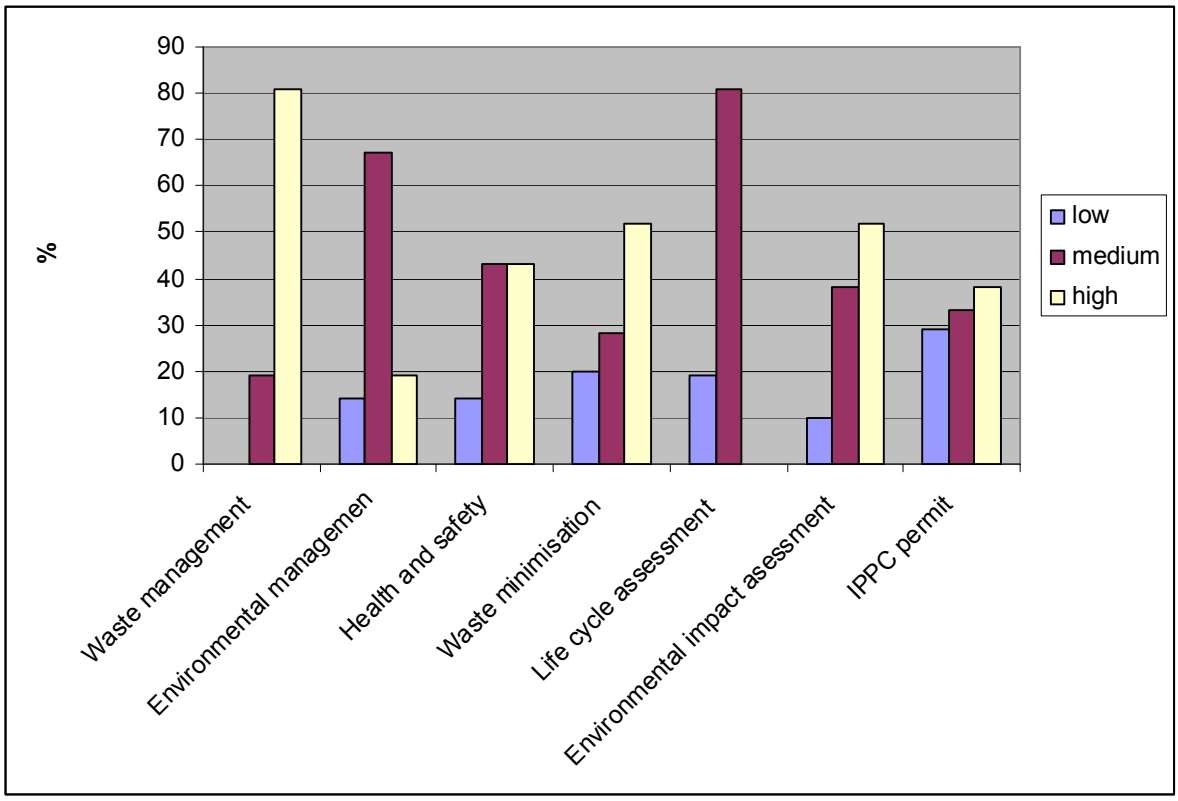


Fig. 25. Importance of practical skills for waste management facilities' professionals – opinion of authorities and associations

7. CURRENT SKILLS OF SOLID WASTE FACILITY MANAGERS AND TECHNICIANS IN PARTICULAR AREAS BASED ON OPINIONS OF DIFFERENT STAKEHOLDERS COLLECTED DURING SURVEY

Quantitative data on opinions of different stakeholders concerning current skills of waste management professionals in Lithuania is summarised in the Table 8.

Table 8. Current skills of waste management professionals in Lithuania

Topic	Current knowledge/ skills among waste management facilities' professionals	
	Waste management facilities	**Authorities and associations**
Waste management procedures in the area concerned	15% low 54% medium 31% high	0% low 76% medium 24% high
Environmental management procedures	18% low 69% medium 13% high	38% low 62% medium 0% high
Health and safety procedures	6% low 59% medium 35% high	28% low 57% medium 15% high
Waste minimisation methodology	15% low 77% medium 8% high	19% low 67% medium 14% high
Life cycle assessment methodology	46% low 54% medium 0% high	52% low 48% medium 0% high
Environmental Impact Assessment methodology	23% low 67% medium 10% high	28% low 38% medium 34% high
Development of IPPC permit application	13% low 61% medium 26% high	43% low 24% medium 33% high

General opinion of waste management facilities is that practical skills of waste management professionals in all surveyed areas are medium. The area with lowest identified skills is life cycle assessment (Fig. 26).

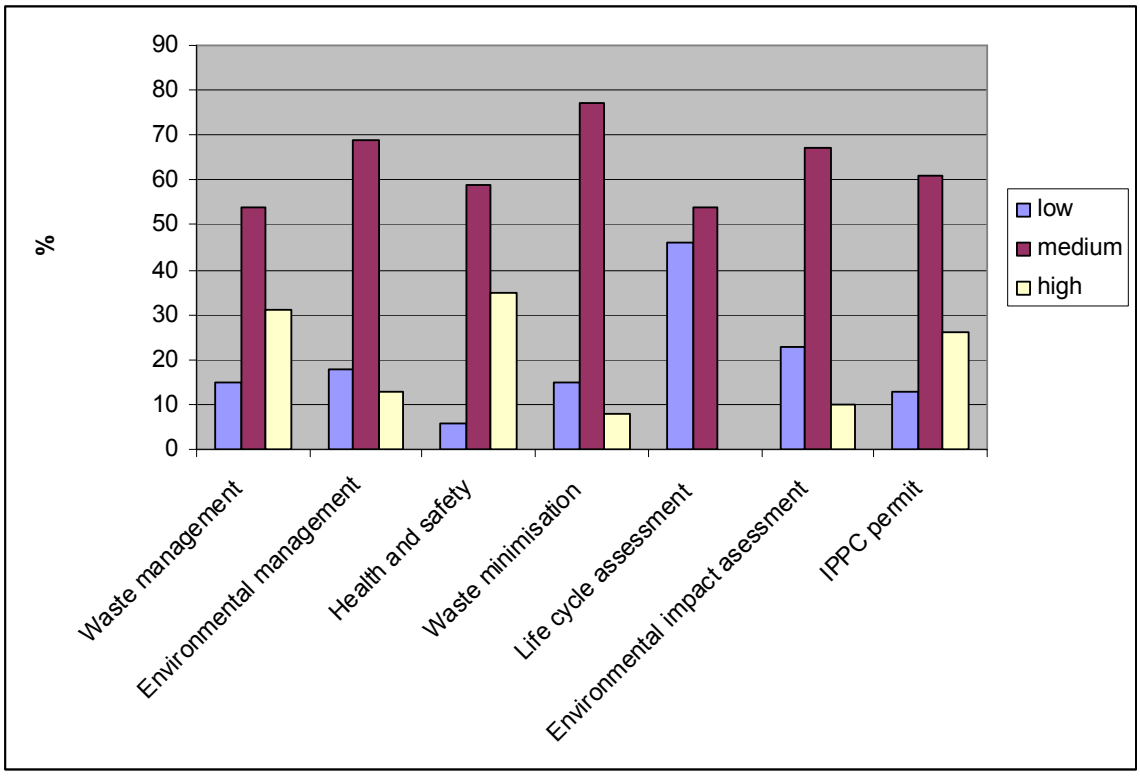


Fig. 26. Current skills of solid waste facility managers – opinion of waste management facilities

In opinion of authorities/ associations, the areas with lowest skills are life cycle assessment and IPPC permit application development (Fig. 27).

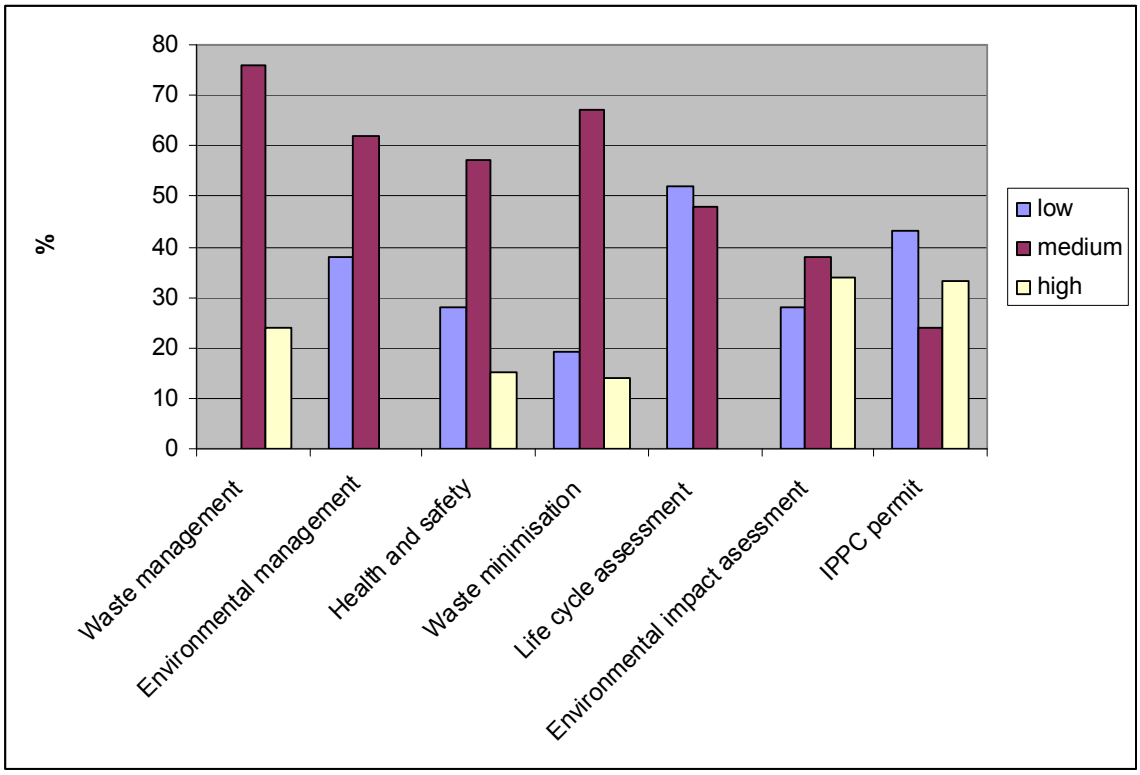


Fig. 27. Current skills of solid waste facility managers – opinion of authorities and associations

8. LABOUR STATUS

Quantitative data concerning labour status of waste management professionals in Lithuania is presented in the table 9. The data is based on opinions of waste management facilities that participated in the survey.

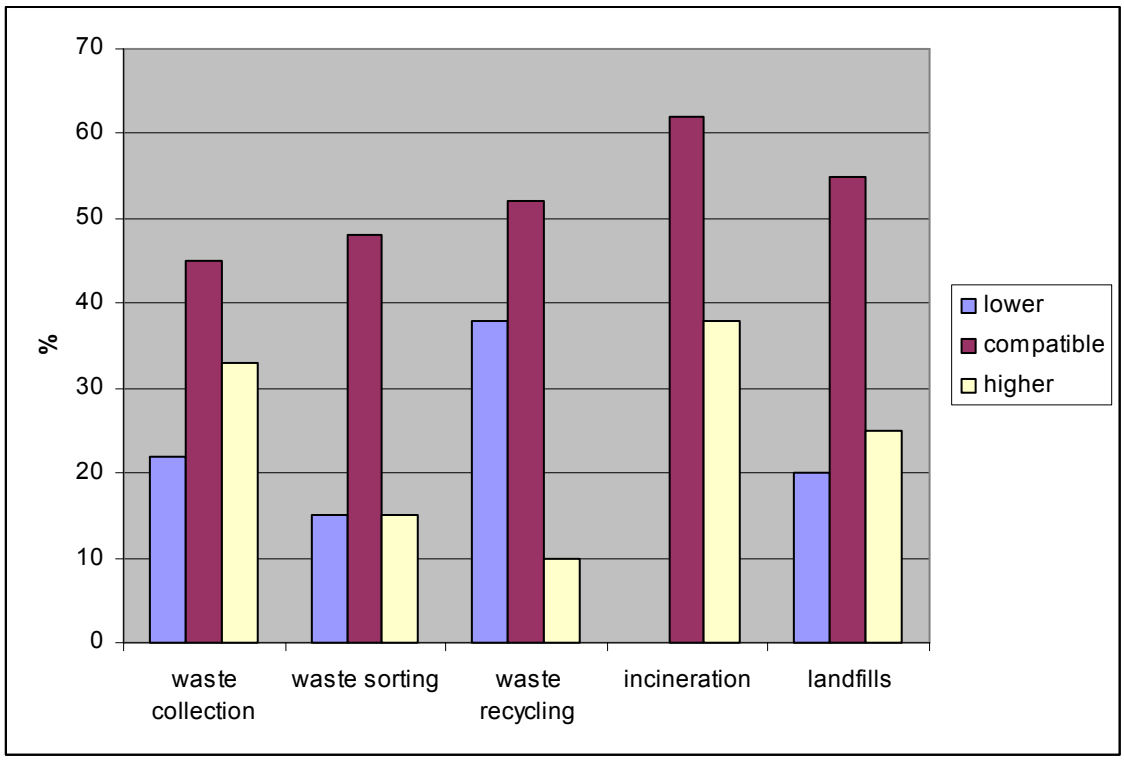
Table 9. Labour status of waste management professionals in Lithuania

Waste management sector	Managers	Technicians
Waste collection	33% - higher 45% - compatible 22% - lower	10% - higher 57% - compatible 33% - lower
Waste sorting	37% - higher 48% - compatible 15% - lower	14% - higher 61% - compatible 25% - lower
Waste recycling	10% - higher 52% - compatible 38% - lower	9% - higher 68% - compatible 23% - lower
Incineration	38% - higher 62% - compatible 0% - lower	6% - higher 75% - compatible 19% - lower
Landfills	25% - higher 55% - compatible 20% - lower	0% - higher 75% - compatible 25% - lower

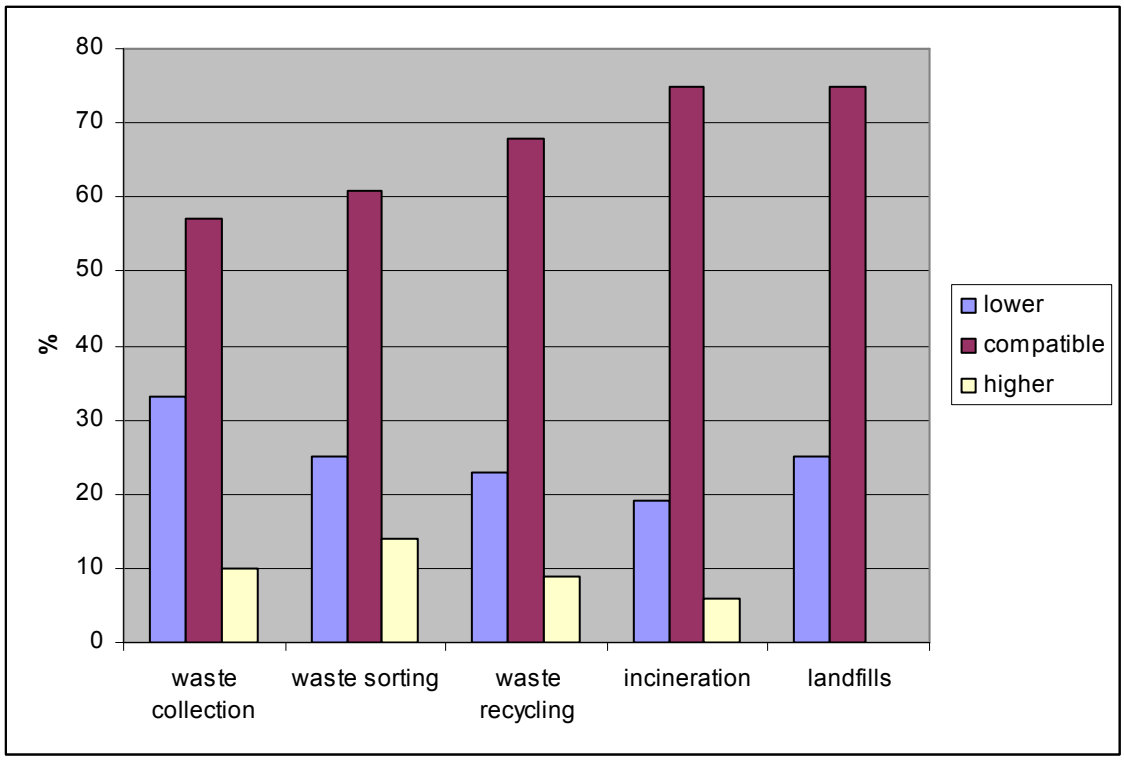
8.1 Salary level in different waste management sectors

Salary level of waste management facilities' managers and technicians in respect to average salary in the country/ (higher/ equal/ lower) in particular waste management sectors (waste collection, waste sorting, waste recycling, incineration, landfills) based on information from waste management facilities is presented in the Fig. 28 and Fig. 29.

General opinion of the survey respondents is that salary level of waste management facilities' managers and technicians is compatible to average salary in the country.



Fig, 28. Salary level of waste management facilities' managers in Lithuania



Fig, 29. Salary level of waste management facilities' technicians in Lithuania

8.2 Employee replacements and work conditions

Data on employee replacements (average number/ year) in waste management facilities based on questionnaire responses from waste management facilities is presented in the Table 10.

According to waste management facilities, employee replacement rate is relatively low. 36% of respondents reported less than 5 replacements, 33% - less than 10 replacements in last 3 years.

Table 10. Average number of employee replacements in waste management facilities in the last three years.

Number of employee replacements	Percentage of responses
< 5	36%
5-10	33%
>10	31%

Data on work conditions (health and safety) in different waste management facilities based on opinions of survey respondents is presented in the Table 11 and Fig. 30. General opinion of the survey respondents is that work conditions are satisfactory in all waste management sectors. More than 30% of respondents believe that work conditions in waste collections sector and landfills are good.

Table 11. Work conditions in waste management facilities in Lithuania

Waste management sector	Work conditions
waste collection companies	8% - bad 51% - satisfactory 35% - good 6% - very good
waste sorting facilities	30% - bad 57% - satisfactory 13% - good 0% - very good
waste recycling facilities	14% - bad 59% - satisfactory 18% - good 9% - very good
incineration facilities	29% - bad 47% - satisfactory 18% - good 6% - very good
landfills	0% - bad 54% - satisfactory 38% - good 8% - very good

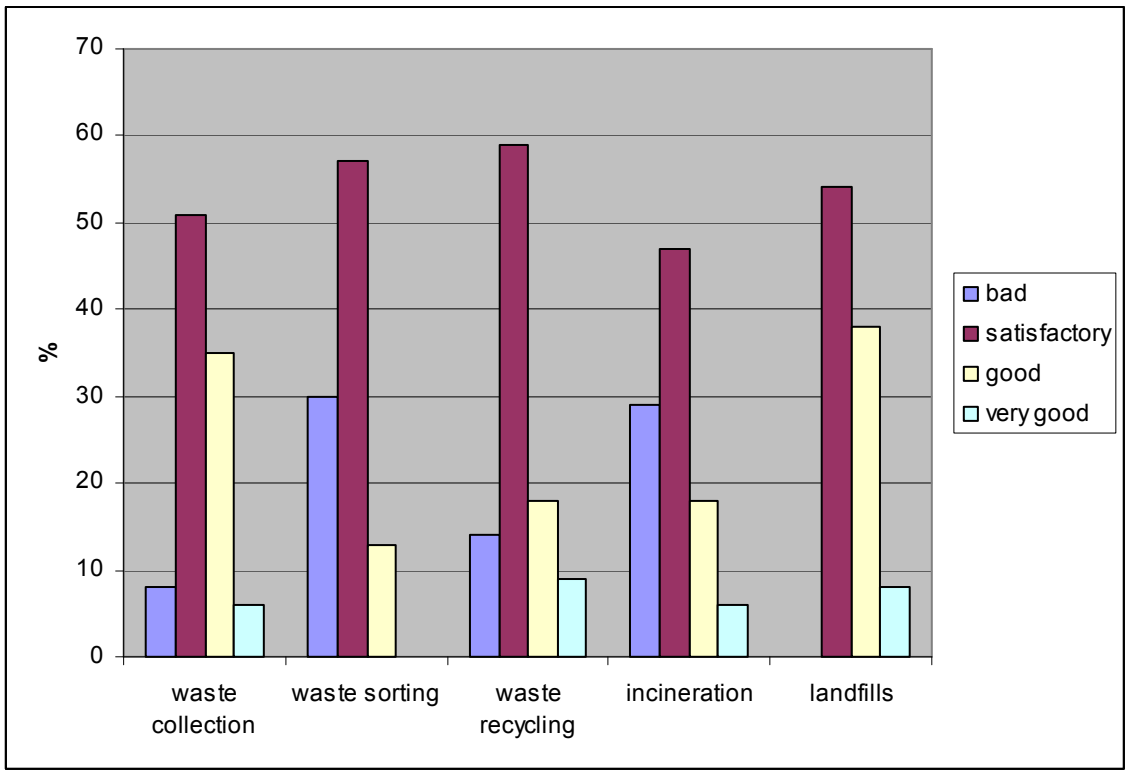


Fig. 30. Work conditions in waste management facilities in Lithuania

8.3 Competition for employment

Data on competition for employment in different waste management facilities in based on questionnaire responses from waste management facilities is presented in the Table 12 and Fig. 31. In opinion of the survey respondents, the highest competition is in the sector of waste collection and waste sorting, but general competition level in all waste management sectors is medium.

Table 12. Competition for employment in waste management sector

Waste management sector	Competition level
waste collection companies	17% - low 58% - medium 25% - high
waste sorting facilities	22% low 63% medium 4% high
waste recycling facilities	39% - low 52% - medium 9% - high
incineration facilities	59% low 35% medium 6% high
landfills	38%low 50% medium 12% high

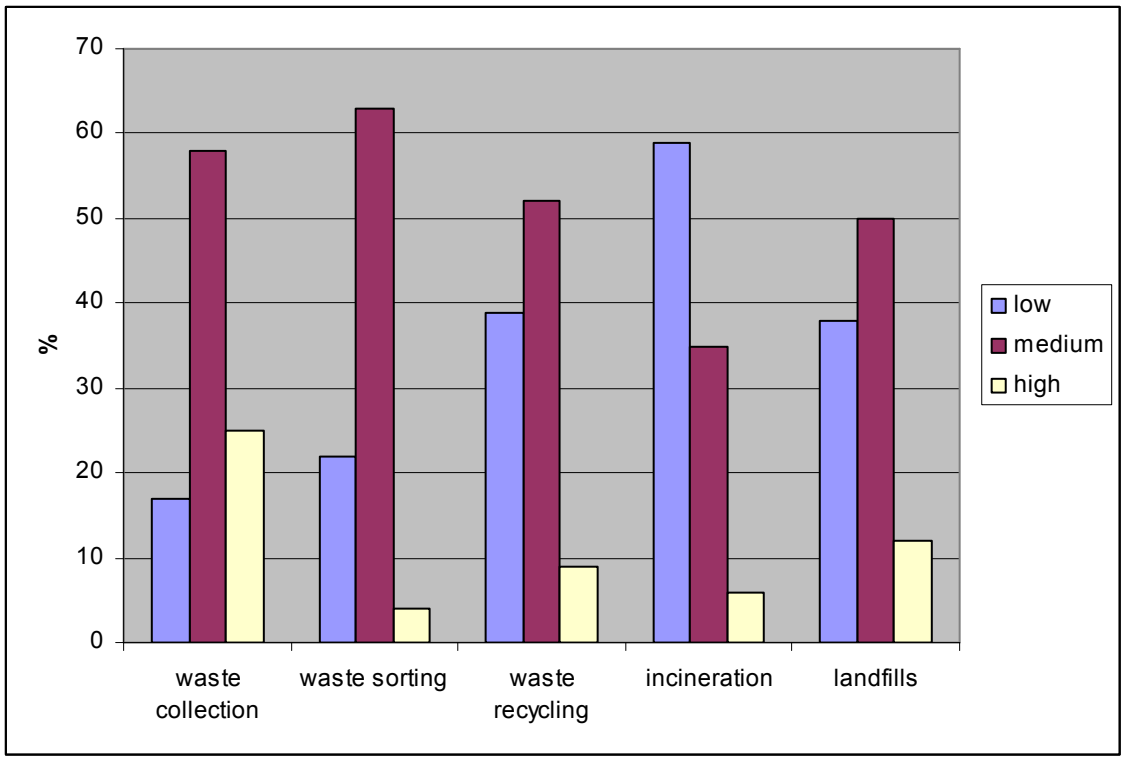


Fig. 31. Competition for employment in waste management sector

9. KEY FINDINGS

Despite relatively small size of the country, significant amounts of waste are generated in Lithuania. 75-85 % of municipal waste is generated by households. The quantity of waste per capita in Lithuania is one of the lowest among the European Union Member States.

Currently, management of municipal waste in Lithuania is organised on the regional basis. There are 10 regions in total, each of them comprising several municipalities. In principle, every municipality prepares its own waste management rules and has its own waste management plan. Municipalities are responsible to organise waste management systems necessary to treat municipal waste generated in their territories. Some of their obligations municipalities allocate to the regions, e.g. operation of landfills. Although municipal waste management system is developing and undergoing various changes in Lithuania, the biggest problem is that still majority of municipal waste ends-up in landfills (partly because of low landfill gate fee).

Summarized data on is presented in the Table 5. Generally, differences in opinions of different stakeholders concerning importance of particular topics of waste management are small. The topics identifies as most important by waste management facilities' representatives are the following: (i) national legal requirements concerning waste management; (ii) national requirements for waste management procedures (licensing, waste accounting, reporting, etc.); (iii) Integrated Pollution Prevention and Control (IPPC) principles, including procedure for IPPC permits; (iv) EU legal requirements concerning waste management; (v) state-of-the-art technologies in the area concerned; (vi) waste management policy principles; and (vi) technical requirements for equipment and technologies of waste management facility / activity in concern.

In opinion of the survey respondents, the areas that waste management professionals are least knowledgeable are the following: (i) product life cycle principles; (ii) state-of-the-art technologies in the area concerned; (iii) corporate social responsibility principles; (iv) principles of environmental management system/ environmental risk management; (v) Environmental Impact Assessment principles; (vi) monitoring requirements; and (vii) principles of environmental management accounting.

General observation concerning importance and current knowledge in different areas is that current knowledge in most cases is at medium level and most topics have been evaluated as very important.

In terms of practical skills, waste management facilities believe that the most important areas are the following: (i): waste management; (ii) health and safety; and (iii) IPPC permit application development. In contrast, authorities and associations believe that waste minimisation and Environmental Impact Assessment procedures are also very important.

General opinion of waste management facilities is that practical skills of waste management professionals in all surveyed areas are medium. The area with lowest identified skills is life cycle assessment. In opinion of authorities/ associations, the areas with lowest skills are life cycle assessment and IPPC permit application development.

In terms of labour status, majority of respondents believe that labour status in all waste management sectors is compatible to other industrial sectors in Lithuania (for both managers and technicians). The salary level of waste management facilities' managers and technicians is also compatible to average salary in the country. According to waste management facilities, employee replacement rate is relatively low. As to work conditions, general opinion of the survey

respondents is that work conditions are satisfactory in all waste management sectors. More than 30% of respondents believe that work conditions in waste collections sector and landfills are good. In opinion of the survey respondents, the highest competition is in the sectors of waste collection and waste sorting, but general competition level in all waste management sectors is medium.

ANNEX 1. MAIN STAKEHOLDERS IN THE FIELD OF MUNICIPAL WASTE MANAGEMENT

Name of the organisation	Contact	Short description of the organisation
Authorities		
Ministry of Environment	Ministry of Environment Waste Department Director: Vilma Karosienė Address: Šermukšnių str. 6a, Vilnius Tel.:+370 5 2663670	Ministry of Environment regulates and administers management of all types of waste, controls implementation of requirements and of waste management tasks. It also coordinates activities of other state and municipal institutions in the field of waste management, searches for financial means to implement state or municipal waste treatment projects.
Municipalities	There are 60 municipalities. Contacts of all municipalities can be found via the link: www.ratca.lt, and then the particular regional waste management centre.	Municipalities are responsible: to organize municipal waste management systems that are necessary for treatment of waste generated in their territory; to ensure functioning of the systems; to organize treatment of waste, whose owner is not known or does not exist; to administer service of municipal waste management.
Regional Waste Management Centres (RWMC)	Alytus RWMC; Kaunas RWMC; Klaipėda RWMC; Marijampolė RWMC; Panevėžys RWMC; Šiauliai RWMC; Tauragė RWMC; Telšiai RWMC; Utena RWMC; Vilnius RWMC; Contacts of all regional waste management centres can be found via the link: www.ratca.lt	Since municipal waste management in Lithuania is organized according to regional principle, municipalities delegate some their functions to Regional waste management centres. E.g. regional waste management centres operate 11 landfills of Lithuania. The main purpose of RWMCs is to implement effectively waste management tasks and to create waste management system.
Major waste management companies		
UAB ”EMP recycling”; UAB “Žalvaris”; UAB “Ekogroup”; UAB “Super Montes”; UAB “Ekstara”; UAB “Skongalis”; UAB “Kuusakoski”; UAB “Monmarkas”; UAB “Ecoservice”; Etc.		The so-called complementary systems in the field of waste collection acted in the territory of 32 municipalities in 2011.
UAB “Fortum Heat Lietuva”	www.fortum.lt Address: J.Jasinskio g. 16B, Vilnius	The main shareholder – Finish corporation Fortum. Waste treatment facilities in Lithuania: waste incineration in Klaipėda, and probably in Kaunas.
Major technology suppliers		

Business development organisations and network with a focus on waste management (e.g waste mgm associations, local and regional business development agencies, branch organisations, non-governmental organisations etc)		
Association of Lithuanian Municipal and Other Waste Managers (LKATA) (Lietuvos komunalininkų ir atliekų tvarkytojų asociacija)	www.lkata.lt Address: Kaštonų g. 4, LT-01107 Vilnius Tel. + 370 5 2619827 lkata@takas.lt President: Algimantas Bakas.	Established in 1996. Currently it has 46 member enterprises, having about 3000 employees and turnover of 300 mln. Litas. Member enterprises are involved in a wide range of activities, dealing with waste collection and management, street and other public territory maintenance, planting green territories, etc. The main tasks are to: 1. Represent and support interests of members; submit proposals for legal acts; 2. Gather and spread information on legal requirements, municipal waste management, best practice, conferences, exhibitions and other events, potential cooperation possibilities, etc. 3. Consult on management of municipal economy, on organizing and delivery of services, on pricing, waste management etc. 4. Organize trainings, seminars etc. on municipal economy management issues.
Association of Regional Waste Management Centres (RATCA) (Lietuvos regioninių atliekų tvarkymo centrų asociacija)	www.ratca.lt Address: J. Kudirkos g. 18, LT-72216 Tauragė Tel. + 370 687 26258 juozas.jankevicius@gmail.com President: Juozas Jankevičius.	Established in 2005. The members are 10 regional waste management centres. The main tasks are to: 1. Develop the regional waste management systems; 2. Initialize development of legal background for functioning of regional waste management systems; 3. Represent member rights and interests against authorities, international and legal institutions; 4. Cooperate and exchange information with related institutions in Lithuania and abroad.
Lithuanian biogass association (Lietuvos biodujų asociacija)	www.lbda.lt Address: Pramonės pr. 21, LT-51328 Kaunas Tel. +370 37 452162 info@lbda.lt, biodujos@gmail.com President: Virginijus Štiormer.	Established in 2008. Since 2009 it is a member of European biogass association. Currently it has 5 members. The main tasks: to coordinate activities of association members and to represent their interests.
Association of biodegradable waste managers (Lietuvos biodegraduojančių atliekų tvarkytojų asociacija)	www.lbata.lt Address: Ateities g. 21, LT-06326 Vilnius Tel. +370 618 11905 Head of association: Virginijus Nariūnas	Established in 2011.
Association of recycling enterprises (APIA) (Antrinio perdirbimo įmonių asociacija)	www.api.lt Address: Gedimino pr. 28/2, Vilnius Tel. +370 687 14368 info@api.lt	There are 14 members. Association is a member of Lithuanian Waste Management Board at the Ministry of Environment. The main tasks are to : 1. Form image of recycling enterprises; 2. Consult members of association on

		managerial, legal, technological, commercial issues; 3. Cooperate and exchange the information; 4. Represent interests of members against the authorities; 5. Present proposals and comments with regard to new and existing legal acts.
Association of collection and recycling of secondary raw materials and waste (AZASPA) (Antrinių žaliavų ir atliekų surinkėjų, perdirbėjų asociacija)	http://perdirbimas.com Address: Palemono g. 1, LT-52159 Kaunas Tel. +370 37 490262 office@maspa.lt, info@maspa.lt President: Marius Kalėda.	Established in 2001. It unites enterprises that collect and recycle secondary raw materials (paper, plastic, glass) and hazardous waste (from automobiles, pharmaceuticals, EEE, metals) Currently there are 6 members. The main tasks are to: 1. Encourage and support member activities; 2. Coordinate member activities of collection and recycling of metals, secondary raw materials and wastes; 3. Consult members on management, economical, legal, technological and commercial issues; 4. Cooperate and exchange experience with analogical organisations (e.g. participate in ENTSORGA in Germany, visit waste collection and recycling enterprises in Germany, Austria, Italy, Estonia, etc.); 5. It is a member of ISWA since 2003; cooperate with Association of recycling enterprises (APIA) and Centre of Innovations at KTU; 6. Organise market analysis, analyse impact of labour, capital, stocks etc. on functioning of members; 7. Represent rights and interests of members against authorities, international organisations, legal institutions; 8. Prepare proposals and comments for legal acts and documents related to member activities. It is a member of Lithuanian Waste Management Board at the Ministry of Environment; participates in working groups at the Ministry of Economy and Ministry of Finances; 9. Organise lectures, seminars, other events.
Association of producers and importers (GIA) (Gamintojų ir importuotojų asociacija)	www.gia.lt Address: A. Juozapavičiaus g. 3-109, LT-09310 Vilnius Tel. +370 5 2730084 info@gia.lt Director: Alfredas Skinulis	Association was established in 2006 and unites 301 member. Its members are producers and importers of batteries and accumulators, packaging, EEE, ELV. Association undertakes producer responsibility tasks of its members.
Association of packaging managers (Pakta) (Pakuočių tvarkytojų asociacija)	www.pakta.lt Address: J. Galvydžio g. 3 – 305 (209), LT-08236 Vilnius Tel. +370 5 2745468, +370 670 17952 info@pakta.lt	Association represents enterprises involved in packaging and in packaging management.

	Head of association: Juozas Kirdeikis	
Association of packaging waste and electronic waste management (PEATA) (Pakuočių ir elektronikos atliekų tvarkytojų asociacija)	www.peata.lt Address: J. Galvydžio g. 3 - 302, LT-08236 Vilnius Tel. +370 5 2745831 office@peata.lt Executive director: Rimantas Akstinas. President: Vladas Kuizinas.	PEATA unites enterprises, which are involved in packaging waste management, and/ or issue packaging waste recovery notes. Established in 2004. There are 5 members.
Association of packaging waste recyclers (Pakuotės atliekų perdirbėjų asociacija)	Address: Konstitucijos pr. 7, Vilnius Executive director: Evaldas Sauliūnas	Association of Packaging Waste Recyclers unites 7 the biggest enterprises dealing with recycling of plastic, glass, cardboard and paper packaging waste.
Association of producers and importers of electric and electronic equipment and of batteries and accumulators (EEPA) (Elektros ir elektroninės įrangos bei baterijų ir akumuliatorių gamintojų ir importuotojų asociacija)	www.epa.lt Address: Laisvės pr. 123, LT-06118 Vilnius Tel. +370 5 2729985 bendras@epa.lt Head of association: Giedrius Mikulskas	Established in 2006. There are 67 members. The main task is to implement provisions with regard to waste management settled in EU and national legal acts for the producers and importers of electric and electronic equipment. Management of WEEE is organised since 2006, management of batteries and accumulators – since 2009. Association: - Organizers management system for WEEE, and batteries and accumulators; - Represents interests of their members, participates in law-making; - Provides waste management reports; - Provides consultations for members of the Association; - Informs society.
Association of demounters (DA) (Lietuvos demontuotjų asociacija)	www.autorecycling.lt Address: Partizanų g. 87A, LT-50312 Kaunas Tel. +370 607 67666, +370 37 314380 info@autorecycling.lt Director: Vidas Pocius	Established in 2005. There are 28 members. DA is an organisation, which administers the network of end-of-life vehicles (ELV) and unites enterprises involved in collection and recycling of ELV. The main tasks are to: 1. Represent demounters, coordinate their activities in implementing legal requirements; 2. Consult on assimilation of international and national funds; 3. Encourage implementation of standards in enterprises; 4. Organise discussions between demounters and environmental specialists; 5. Expand cooperation among importers, demounters, and waste managers; 6. Organise qualification trainings; 7. Increase sales and export of demounted spare parts.
National confederation of waste managers (Nacionalinė atliekų tvarkytojų konfederacija)	Address: Partizanų g. 87A, LT-50312 Kaunas Tel. +370 37 314380 Head of organisation: Vidas Pocius	Established in 2007, it unites 4 branch associations: DA, AZASPA, APIA, PEATA.

Financial institutions (international or national) to WM investments in the Baltic Sea Region		
Environmental Protection Management Agency at the Ministry of Environment of the Republic of Lithuania (APVA)	www.apva.lt Address: Labdarių g. 3, LT-01120 Vilnius Te. +370 5 272 57 58 apva@apva.lt	It provides EU structural assistance to Lithuania.
Lithuanian Environmental Investment Fund (LAAIF)	www.laaif.lt Address: Vytauto g. 12, LT-08118 Vilnius Tel.: +370 5 2169599 laaif@laaif.lt	It provides financial support to private and public sector for implementation of projects intended to reduce environmental pollution.