

Internet Voting at the Elections of Local Government Councils on October 2005

Report¹

The purpose of the report is to give an overview of the preparations of Estonia's e-voting project and find answers to possible social-scientific questions connected with Estonia's e-voting project.

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1. Background Information

1.1 Use of Terms

Throughout the Report, the term ‘e-voting’ is used to denote voting on the Internet; the term is used in the same meaning also by the Estonian public.

Besides voting on the Internet, the concept of electronic voting or e-voting also embraces other electronic voting methods, including methods of casting, forwarding and counting the votes. Thus the concept of e-voting is wider than voting on the Internet, and Estonia’s e-voting includes casting the vote as well as forwarding and counting the votes.

The purpose of implementation of voting on the Internet in Estonia is not to replace the existing ways of voting in the nearest future.

1.2. Eligible residents

People who have gotten used to fundamental reforms in recent years are comparatively open to innovative solutions. Estonia, whose number of population is relatively small, sees itself as a successful e-state: Internet access is easy and genuinely available to the majority of the population, also the number and availability of e-services is increasing year by year.

In terms of e-voting the most important factor is the mandatory ID card that has the functions of remote authentication of persons and digital signature. The small number of population enabled to implement the ID card project very quickly: since 2002 it is compulsory to hold an ID card². By February 2006 over 900.000 cards are issued, thus, 65% of Estonian residents hold the ID-card (source: AS Sertifitseerimiskeskus, <http://www.sk.ee/cgi-bin/cards.py>).

Table 1 Number of Population in the Local Government Council Election Years
Source: Statistical Office of Estonia (<http://pub.stat.ee>)

YEAR OF ELECTIONS	1993	1996	1999	2002	2005
Number of population	1 511 303	1 425 192	1 379 237	1 361 242	1 347 510

The number of eligible voters at the local government council elections has been increasing year by year. Besides the citizens of Estonia and other EU member states, aliens residing in Estonia who are not citizens of the EU but have lived in one and the same town or municipality of Estonia at least five consecutive years are also eligible to vote at the local government council elections.

² Identity Documents Act § 39 (<http://www.legaltext.ee/text/en/X30039K10.htm>)

Table 2 Number of Population with the Right to Vote in the Local Government Council Election Years

Source: web page of National Electoral Committee (<http://www.vvk.ee>)

ELECTIONS	LGC 1993	LGC 1996	LGC 1999	LGC 2002	LGC 2005
Number of eligible voters	880 296	879 034	1 062 028	1 021 439	1 059 292

Large part of the people of Estonia live in urban areas, this facilitates Internet access and also creates possibilities for using ID card for e-voting. Projects like “Village road” for spreading Internet using skills and access to the Internet also reach also rural regions. More than 1,000 free Internet access points have been opened all over Estonia, possibility to use the Internet is also offered at public libraries. Since 1 January 2006 all legal acts are available only through the Internet, in the electronic *Riigi Teataja*, which in its turn requires facilitating Internet access.

Table 3 Urbanisation indicators in 2005

Source: Statistical Office of Estonia (<http://pub.stat.ee>)

	Number	%
Population in towns	898 136	66,7
Population of rural municipalities	449 374	33,3

Table 4 Number of Population in Tallinn and Tartu in 2005

Source: Statistical Office of Estonia (<http://pub.stat.ee>)

	Number	%
Tallinn	396 010	29,4
Tartu	101 483	7,5
Total population of Estonia	1 347 510	100,0

1.3. Economic Welfare in Election Years

As economic welfare is one of the factors that influence voter turnout in voting and trust in the state, it has been described below through average gross salary, gross domestic product and state budget volume in election years. The possible influence of economic welfare on voter turnout and attitude towards e-voting is not dealt with in this report.

Table 5 Average Gross Salary in the Election Years

Source: Statistical Office of Estonia (<http://pub.stat.ee>)

YEAR OF ELECTIONS	1993	1996	1999	2002	2005
Average gross salary	1069 EEK 69 •	2986 EEK 191 •	4418 EEK 283 •	6110 EEK 392 •	7835 EEK 502 •

The growth rate of average gross salary in 2005 in comparison to the previous year was 11.8%.

Table 6 Volume of State Budget in Election Years

Source: Statistical Office of Estonia (<http://pub.stat.ee>)

YEAR OF ELECTIONS	1993	1996	1999	2002	2005
State budget million EEK	4 151	13 368	17 571	33 639	53 072
•	266	857	1 126	2 156	3 402

Table 7 GDP in Election Years

Source: Statistical Office of Estonia (<http://pub.stat.ee>)

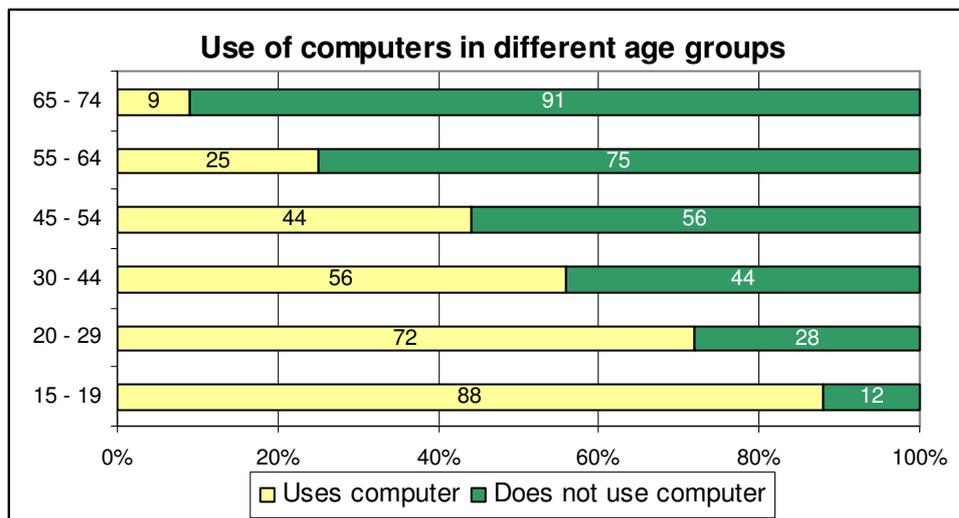
YEAR OF ELECTIONS	1993	1996	1999	2002	2005
GDP million EEK	22 820	55 895	81 775	116 915	141 493
•	1 462	3 583	5 241	7 494	9 070

1.4. Internet Access

In Estonia the use of digital channels is steadily widening. Over 50 % of residents of Estonia use Internet, 40% of households have a computer at home and 81% of home computers are connected to the Internet³. Nowadays all schools and public libraries have Internet connection. Many national projects like “Vaata Maailma, “Tiigrihüpe” and “Külatee” have been successfully carried out to ensure for all Estonian citizens benefits related to the use of computers and the internet and to increase the supply and availability of fast internet connections.

Table 8 Use of Computers in Different Age Groups in 2004

Source: *Eesti elavik 21. sajandi algul (Life-World of Estonia at the Beginning of the 21 Century)*, Tartu 2004



The results of the study of 2004 that were the source material for *Eesti elavik* and according to which **48%** of the population of Estonia used the computer (**57% of them** every day), can be compared with the data of TNS Emor study on 2004 and 2005.⁴

³ Survey „E-Seire”, TNS Emor Sept-Nov 2005

⁴ The book “Eesti elavik 21. sajandi algul” (*Life-World of Estonia in the Beginning of the 21 Century*; editors Veronika Kalmus, Marju Lauristin and Pille Pruulmann-Vengerfeldt, TÜ kirjastus 2004) is a survey of the results of broad research “Mina. Maailm. Meedia.” (*I. World. Media*).

Table 9 Use of Computers in Different Age Groups in 2004 and 2005

Source: TNS Emor 2005

AGE IN YEARS	MARCH–MAY 2004, % OF THE STUDIED GROUP	MARCH–MAY 2005, % OF THE STUDIED GROUP
6 - 9	47	57
10 - 14	86	91
15 - 24	88	91
25 - 34	71	71
35 - 49	49	50
50 - 74	17	19

1.5. E-Services

Electronic X-road environment (<http://x-tee.riik.ee>) embraces the e-services offered by the state. 355 institutions and 50 national data bases are already connected through it. 106,346 citizens, 30,000 more than the year before, used the X-road environment in 2005.

E-services in use are follows:

* X-road – data exchange layer and citizen portal through which enquiries can be made from following registers:

- Estonian Health Insurance Fund
- Estonian Motor Vehicle Registration Centre
- Register of Construction Works
- Databases of Citizenship and Migration Board
- Land cadastre
- Register of mandatory funded pension
- Register of professional certificates
- Land Information system
- Register of Economic Activities
- State Pension Insurance Register
- Population Register
- Databases of National Examination and Qualification Centre
- SAIS - Admissions Information System to higher education institutions
- Register of weapons
- Database of individuals and cases pending in execution procedure
- Commercial Register
- The Register of Students of Higher and Vocational Education Institutions

- * E-services of Estonian banks
- * Electronic catalogue of Estonian libraries
- * Electronic state gazette “Riigi Teataja”
- * Electronic management systems of draft legislation
- * E-Kool – system enabling to monitor over Internet grades given at school.
- * Citizen’s portal www.eesti.ee
- * TOM-portal
- * Database of Court Decisions
- * E-billing portal

* eTaxBoard for forwarding tax declarations online

* Electronic services of the Estonian Agricultural Registers and Information Board

For using e-services whether the identification systems of private banks or ID card can be used. Besides electronic identity and digital signature the ID card is also used as library card, travel card on public transport, Health Insurance Fund membership card etc.

The most widespread and used e-service is the Internet bank: 72% of adult Internet users use online banking services.⁵ Electronic submission of income declarations has become very popular. According to Tax and Customs Board, 76% of declarations were submitted electronically in 2005. This tendency has been increasing year by year.

It is planned to develop new e-services, including an electronic childcare service environment, paper-free car register and e-health project etc. Transition to digital correspondence between state agencies and between citizens and state agencies is intended. More information about e-services can be found on website www.riso.ee/en.

1.6. ID-Card⁶

Estonian e-voting system is based on ID card. As far as it is known, Estonia is the only state in the world where an ID card enabling remote identification of persons and digital signing is compulsory and issued to more than half of the population. As of February 2006, more than 900,000 had been issued, thus about 65% of the population holds an ID card.

According to the Identity Documents Act, citizens of Estonia and aliens staying permanently in Estonia must hold an ID card. A certificate which enables digital identification and a certificate which enables digital signing shall be entered on each identity card.

Extract from the Identity Documents Act:

§19.

Basis for issue of identity cards⁽¹⁾ An identity card is an internal document held by an Estonian citizen or an alien staying permanently in Estonia. Identity cards shall be issued to the following:

1) Estonian citizens;

2) aliens staying (residing) permanently in Estonia who have valid residence permits.

¹⁾ An Estonian citizen may cross the Estonian state border which also is a border between Member States of the European Union with a valid identity card.

2) Other documents established by this Act shall be issued on the basis of data entered on the identity card of the person concerned. This subsection does not apply to persons who, pursuant to this Act, need not hold an identity card.

[RT I 2004, 28, 189 – entered into force 1. 05. 2004]

§19¹. Digital data to be entered on identity card

⁵ TNS Emor e-monitoring 2nd period 2005

⁶ source www.id.ee, www.pass.ee

(1) A certificate which enables digital identification and a certificate which enables digital signing shall be entered on an identity card. The list of other digital data entered on an identity card shall be approved by the Government of the Republic, having regard to the provisions of subsection 9 (3) of this Act.

(2) If a certificate is entered in a document within the meaning of the Digital Signatures Act (RT I 2000, 26, 150; 92, 597), a description of the limitations on the scope of use shall not be entered in the certificate.

(3) Certification service providers specified in subsection 18 (1) of the Digital Signatures Act shall issue certificates specified in subsection (1) of this section.

[RT I 2001, 56, 338 – entered into force 7. 07. 2001]

The project of an ID card enabling remote identification and digital signing was initiated in 1997. The obligation to hold an ID card was established by the Identity Documents Act which was adopted in 1999 and entered into force on 1 January 2000, and according to which the holding of ID card is obligatory since 1 January 2002. In 2000 the provision on the possibilities of digital using of ID card was added to the Act. In addition to that, the Digital Signature Act was adopted in March 2000. .

Subsection 3 (1) of Digital Signature Act stipulates: “A digital signature has the same legal consequences as a hand-written signature if these consequences are not restricted by law and if the compliance of the signature with the requirements of subsection 2 (3) of this Act is proved.” and subsection 4 (3): “State and local government agencies, legal persons in public law, and persons in private law performing public law functions are required to provide access through the public data communication network to information concerning the possibilities and procedure for using digital signatures in communication with such agencies and persons.”

Subsection 5 (6) of Administrative Procedure Act stipulates: “In administrative procedure, electronic operations shall be equal to written operations. Digital signatures shall be used in administrative procedure pursuant to the procedure provided for in the Digital Signatures Act and other legislation.”

Similarly to administrative procedure, in court proceedings it is also possible to present all procedural documents digitally signed.

Upon the issue of ID card a person is given two PIN codes. PIN 1 is meant for digital identification of a person and PIN 2 for digital signing. Besides that, an e-mail address (in the format firstname.lastname@eesti.ee) is given with the ID card. The PIN codes and PUK code necessary for the electronic use of the ID card are known only to the owner of the card, the codes are issued in a safety envelope together with the ID card. Digital signature is verified and authenticated to another party by Sertifitseerimiskeskus AS who provides certification service and also administers the list of suspended and revoked certificates.

The problem that had to be solved before the implementation of e-voting was the updating of ID card certificates and restoring PIN codes. The period of validity of ID card is ten years, but the period of validity of ID card's security certificates is three years. Thus part of the certificates had expired immediately before the elections in 2005. On the other hand, most of the ID card holders do not use the card electronically and they have no need for PIN codes, so they have been lost or destroyed in the course of time. E-services which require ID card with codes have been created but in most cases it is possible to use these services also with the help of identification systems offered by banks that do not require the procurement and adjustment of a card reader.

1.7. Electronic Data Transmission and Processing at Earlier Elections

Already for years the registration of electors has been electronic in Estonia, and on the basis of it the lists of voters are printed out. This has been one of the preconditions for the implementation of electronic voting.

The public's peaceful reaction to the e-voting project may be explained with the fact that according to wider definitions e-voting has taken place in Estonia for years (according to the definition in the recommendation of Council of Europe⁷, e-voting is using electronic means in one or several stages of election procedures).

In the 1990s the main means of data transmission were telephone, fax and electronic mail, but in 1999 the National Electoral Committee started using Internet-based electoral information system (EIS).

The system is used by all electoral committees of different levels (electoral committees of divisions, rural municipalities, cities and counties). HTML screen formats are used for collecting and updating the data in the infosystem user interface. Electoral committees who have username and password have access to user interface. Each committee can transmit and change only their own data and the data of their subcommittees. National Electoral Committee coordinates the use of the system.

Central database and web servers that serve all data entry points are the focal part of electoral information system. Only Internet connection and web browser are needed in the user's workplace computer. In the centre, all users are served and the received data is collected into the database. The database can be used for generating in real time suitable outlets to the National Electoral Committee web page which is the main channel for publication of data.

Data base of the electoral information system contains data of electoral districts, electoral committees, polling divisions, candidates, political parties and election coalitions (determined when the elections are prepared), and voting and election results (received when the elections are carried out). On the average three months before the election day the establishing of data base for these elections begins and the active use period of EIS ends about a week after the elections.

In connection with the implementation of e-voting in 2005 EIS was the channel through which the information exchange guaranteeing that each voter could vote only once took place. Also the results of e-voting from vote counters, i.e. from the National Electoral Committee reached the electoral committees of rural municipalities and cities in electronic form through EIS.

EIS is constantly developing, proceeding from experience and growing needs. In 2007 it is planned to establish a direct connection between EIS and population register in order to control the right to vote, information on the residence etc. of the candidates and members of committees entered into EIS database.

Although a large amount of data is collected electronically via EIS, alternative ways of data transmission can also be used by those electoral committees who have no access to the Internet and computer in the polling place or its immediate vicinity.

⁷ Recommendation Rec(2004)11 "Legal, operational and technical standards for e-voting"

It must be noted that as all polling divisions are not yet equipped with computers and Internet connection, the lists of voters are still printed out on paper, and when the printed lists and electronic data are compared, it is checked that only one vote is counted for each voter.

1.8. Electoral System

In Estonia local government councils are elected for four years on the basis of proportional electoral system.⁸ Each voter has one vote.

Not later than on the 90th day before the election day the local government council forms electoral districts, as a rule there is one electoral district on the territory of one rural municipality or city. In Tallinn the electoral districts are formed on the basis of city districts.⁹

2005. At the time of the local government council elections in 2005 there were 227 cities and rural municipalities, but 240 electoral districts in Estonia.

A simple quota shall be calculated for each electoral district, which shall be obtained by dividing the number of valid votes cast in the electoral district by the number of mandates. A candidate in favour of whom the number of votes cast exceeds or equals the simple quota shall be elected. Mandates which are not distributed in electoral districts on the basis of a simple quota shall be distributed as compensation mandates between the political parties and election coalitions whose candidates receive at least 5 per cent of the votes nationally. To be elected, an independent candidate must collect the number of votes that equals or exceeds the simple quota.

For the distribution of mandates the candidates shall be re-ranked according to the number of votes received by each candidate. If at least two candidates receive an equal number of votes, the candidate who is further towards the bottom of the list shall be ranked ahead. The votes cast for candidates standing in the list of candidates of the same political party or an election coalition shall be totalled. Mandates are divided according to the d'Hondt distribution method (with the distribution series of 1, 2^{0.9}, 3^{0.9}, 4, etc). If the comparative figures of at least two political parties or election coalitions are equal, the political party or election coalition whose candidates are further towards the bottom of the general list of candidates in the electoral district shall be given the mandate.

⁸ Due to relative smallness of electoral districts and the use of modified d'Hondt method that prefers larger vote collectors, the level of unproportionality has increased in converting the votes to mandates.

⁹ Local Government Council Election Act (RT I 2002, 36, 220) § 8

1.9. Voter Turnout

Table 10 Voter Turnout at Local Government Council Elections

Source: National Electoral Committee web page

ELECTIONS	LGC 1993	LGC 1996	LGC 1999	LGC 2002	LGC 2005
Number of voters	464030	462439	530723	536044	502504
Voter Turnout (%)	52,71	52,61	49,97	52,48	47,44

Voter turnout in municipal elections is generally smaller than in parliamentary elections. At the Riigikogu elections turnout has been somewhat bigger (58% in 2003) but the participation rates did not exceed 70 per cent even at the referendum of 1992 when the Constitution was adopted (it was 67% then) nor at the first round of voting at presidential elections (68%).

1.10. E-Voting Debate at the Riigikogu

E-voting was legalised in all election acts in 2002, when there were the following political parties in the parliament:

- ⌘ Estonian Centre Party with 28 mandates
- ⌘ Estonian Coalition Party with 7 mandates
- ⌘ Estonian People's Union with 7 mandates
- ⌘ Isamaaliit with 18 mandates
- ⌘ Reform Party with 18 mandates
- ⌘ United People's Party of Estonia with 6 mandates
- ⌘ People's Party Mõõdukad with 17 mandates

Due to proportional election system all political parties with wider support are represented in the Riigikogu. Estonian Centre Party, Estonian Coalition Party, Estonian People's Union, Reform Party and United People's Party of Estonia supported e-voting, Isamaaliit and Mõõdukad were against.

The chronology of the act on e-voting was the following:

1. Initiation of the draft of Local Government Councils Election Act 30 April 2001
2. First reading of the bill at the Riigikogu 13 June 2001
(http://web.riigikogu.ee/ems/stenograms/2001/06/t01061318-28.html#P2693_612185)
3. Second reading of the bill at the Riigikogu 23 January 2002
(http://web.riigikogu.ee/ems/stenograms/2002/01/t02012302-07.html#P258_62979)
4. Resumption of the second reading of the bill at the Riigikogu 27 February 2002
(http://web.riigikogu.ee/ems/stenograms/2002/02/t02022706-12.html#P497_105059)
5. Resumption of the second reading of the bill and adoption of the Act at the Riigikogu 27 March 2002 Result of voting (55 in favour, 31 against, 0 abstentions)
(http://web.riigikogu.ee/ems/stenograms/2002/03/t02032709-07.html#P385_68538)

(The Act entered into force on 6 May 2002)

In 2003 the following political parties were elected to the Riigikogu (number of mandates after the elections):

- ‡ Estonian Centre Party with 28 mandates (www.keskerakond.ee)
- ‡ Estonian People's Union with 13 mandates (www.erl.ee)
- ‡ *Isamaaliit* with 7 mandates (www.isamaaliit.ee)
- ‡ Reform Party with 19 mandates (www.reform.ee)
- ‡ Res Publica with 28 mandates (www.respublica.ee)
- ‡ Social-Democratic Party 6 mandates (www.sotsdem.ee)

In 2005, at the debates on making amendments to e-voting provisions, the division of mandates was the following:

- ‡ Estonian Centre Party with 20 mandates
- ‡ Estonian People's Union with 16 mandates
- ‡ *Isamaaliit* with 7 mandates
- ‡ Reform Party with 22 mandates
- ‡ Res Publica with 26 mandates
- ‡ Social-Democratic Party with 10 mandates

The results of voting at the final voting on 26 June 2005 (52 in favour, 0 against, 0 abstentions):

- ‡ Estonian Centre Party did not vote (against)
- ‡ Estonian People's Union did not vote (against)
- ‡ *Isamaaliit* in favour
- ‡ Reform Party in favour
- ‡ Res Publica in favour
- ‡ Social-Democratic Party in favour

The following are references to verbatim records of the debates on the issue:

1. First reading of the bill at the Riigikogu 12 April 2005
(http://web.riigikogu.ee/ems/stenograms/2005/04/t05041211-09.html#P576_110846)
2. Second reading of the bill at the Riigikogu 3 May 2005
(http://web.riigikogu.ee/ems/stenograms/2005/05/t05050313-01.html#P26_1021)
3. Resumption of the second reading of the bill at the Riigikogu 11 May 2005
(http://web.riigikogu.ee/ems/stenograms/2005/05/t05051114-06.html#P326_55674)
4. Third reading and adoption at the Riigikogu 12 May 2005
(http://web.riigikogu.ee/ems/stenograms/2005/05/t05051214-04.html#P108_18987)
5. 25 May 2005 resolution of the President of the Republic on the refusal to proclaim the Act RTL 2005, 58, 829
6. Renewed deliberation of the Act, refused to be proclaimed by the President, at the Riigikogu on 1 June 2005 (http://web.riigikogu.ee/ems/stenograms/2005/06/t05060116-05.html#P280_52355)
7. Second reading of the draft Act, refused to be proclaimed by the President, at the Riigikogu on 09 June 2005 (http://web.riigikogu.ee/ems/stenograms/2005/06/t05060917-08.html#P359_85217)

8. Third reading of the second proceeding of the draft Act refused to be proclaimed by the President and adoption of the amended Act at the Riigikogu on 15 June 2005 (<http://www.president.ee/et/ametitegevus/otsused.php?gid=64640>)
9. Resolution of the President of the Republic of 22 June 2005 on the refusal to proclaim the Act RTL 2005, 74, 1059 (<http://www.president.ee/et/ametitegevus/otsused.php?gid=64640>)
10. Renewed deliberation of the Act, refused to be proclaimed by the President, and adoption, unamended, at the Riigikogu on 28 June 2005 (http://web.riigikogu.ee/ems/stenograms/2005/06/t05062801-03.html#P39_2700)
- 11 Proposal of 12 July 2005 of the President of the Republic to the Supreme Court to declare the Act unconstitutional.
12. Decision of the Supreme Court of 1 September 2005 to deny the request of the President, Decision No. 3-4-1-13-05 (<http://www.nc.ee/klr/lahendid/tekst/RK/3-4-1-13-05.html>)
13. Resolution No. 888 of 5 September 2005 of the President of the Republic on proclamation of the Act (<http://www.president.ee/et/ametitegevus/otsused.php?gid=64640>)
14. Entry into force of the Act on 18 September 2005, RT I 2005, 47, 387.

2. E-Voting Project: Legislation, Budget, Management

2.1. Legal Debate over the Conformity of E-Voting with Election Principles

2.1.1. E-Voting Provisions Adopted in 2002

On 27 March 2002 the Riigikogu adopted the Local Government Councils Election Act which gave the right to vote electronically on the web page of the National Electoral Committee on the days of advance polling. Subsection 74 (5) of the Act stipulated that electronic voting would not be applied before 2005. Such norm of enactment lost its regulatory action on 1 January 2005. Thus the Act granted the voters the right of e-voting beginning from the local government council elections of 2005.

The provisions on e-voting adopted in 2002 are the following:

§ 44. Time of voting

(1) Voting on election day shall open at 9 a.m. and close at 8 p.m.

(2) Advance polls shall begin on the sixth day before election day and close on the fourth day before election day. Voting on advance polling days shall open at 12 p.m. and close at 8 p.m. Votes can be submitted using electronic means on a twenty-four hour basis.

(3) Home voting shall be held on election day in the cases prescribed in this Act.

(4) Voting in custodial institutions shall be held on advance polling days in the cases prescribed in this Act.

§ 47. Specifications for advance polls held outside polling division of residence

(1) On advance polling days (subsection 44 (2)), voters may vote outside the polling division of their residence in a polling division designated by the rural municipality or city government or electronically on the webpage of the National Electoral Committee.

(2) A division committee designated by the rural municipality or city government shall organise voting outside the polling division of residence. The rural municipality or city government may designate a division committee which, in addition to advance polls, organises voting only at the location of a voter (§ 49) or only in custodial institutions (§ 51).

§ 50. Electronic voting

(1) On advance polling days, voters holding a certificate for giving a digital signature may vote electronically on the webpage of the National Electoral Committee. A voter shall vote himself or herself.

(2) A voter shall identify himself or herself by giving a digital signature.

(3) After identification of the voter, the general list of candidates in the electoral district of his or her residence shall be displayed on the webpage.

(4) The voter shall indicate on the webpage the candidate in the electoral district of his or her residence for whom he or she wishes to vote and shall confirm the vote.

(5) A notice that the vote has been accepted shall be displayed to the voter on the webpage.

§ 53. Calculation of votes cast during advance polls outside polling division of residence

(1) A division committee shall pack the envelopes with the ballot papers of electors who voted outside the polling division of their residence by the counties, and by the cities of Tallinn and Tartu, and shall forward such envelopes to the county electoral committee of their location.

(2) A county electoral committee shall forward the envelopes with ballot papers specified in subsection (1) of this section to the corresponding county electoral committees through the National Electoral Committee not later than on the second day before election day.

(3) After the close of electronic voting, the National Electoral Committee shall prepare a list of persons who voted electronically by polling divisions and shall forward the list to the county electoral committees not later than on the second day before the day of the referendum.

(4) A county electoral committee shall forward the envelopes with ballot papers received pursuant to the procedure provided for in subsections (2) and (3) of this section from other county electoral committees and the lists of voters who voted electronically to the appropriate division committees not later than on the day before election day.

(5) After receipt of the envelopes with ballot papers and the list of voters who voted electronically pursuant to the procedure prescribed in subsection (4) of this section, the division committee shall check that each voter is entered in the polling list of the polling division and that he or she has not voted more than once. At least three members of the division committee shall be present during the verification.

(6) If a voter has not been entered in the polling list of a polling division or has voted several times, the division committee shall not take into account any of the ballot papers of the voter received pursuant to the procedure prescribed in subsection (4) of this section. If a voter has voted several times, including electronically, the division committee shall promptly send a corresponding notice to the National Electoral Committee. On the basis of the notice, the National Electoral Committee shall not take into account a vote cast electronically by the

voter. If the voter has not voted in the polling division of his or her residence, a member of the division committee shall make a notation in the polling list concerning voting at the advance polls.

(7) After performing the acts prescribed in subsections (5) and (6) of this Article, the division committee shall open the outer envelopes, deposit the inner envelopes with ballot papers in the ballot box used at the advance polls and seal the opening of the ballot box again.

§ 55. Verification of voting results in rural municipality or city electoral committees

(1) On the basis of the records received from the division committees and the voting results of voters who voted electronically, the rural municipality or city electoral committee shall verify the number of voters entered in the polling lists, the number of voters who were given a ballot paper, the number of voters who participated in voting, the number of invalid ballot papers and the number of votes cast for candidates, political parties and election coalitions in each electoral district. The result obtained shall be checked by recounting the ballot papers.

(2) If the numbers obtained by recounting the ballot papers are different from the numbers in the records of a division committee, the rural municipality or city electoral committee shall set out the differences and the circumstances which caused such differences in the appendix to the record. The records of the division committee shall not be amended. The rural municipality or city electoral committee shall adopt a decision concerning the final voting results.

(3) A rural municipality or city electoral committee shall prepare a standard format record concerning verification of the voting results in the rural municipality or city which shall be signed by the chairman of the committee. The date and time of preparation shall be indicated in the record.

(4) The results of electronic voting shall not be disclosed before the close of voting on election day.

(5) Voting results shall be verified in rural municipality or city electoral committee in public.

§ 74. Entry into force of Act

This Act enters into force on the tenth day after publication in the Riigi Teataja.

(2) Section 71 and clause 72 2) enter into force on 17 October 2005.

(3) Clause 72 1) enters into force on 21 October 2002.

(4) The provisions of subsections 5 (1) and (5), subsections 14 (1) and (2), clause 17 (4) 3), § 25, subsection 31¹ (1) and clause 31¹ (3) 4) concerning citizens of the European Union enter into force upon Estonia's accession to the European Union.

(5) Electronic voting is not applied before 2005.

2.1.2. Amendments of 2005

Description of the e-voting procedure in the Act adopted in 2002, among other things, left it open whether it is allowed to change the e-vote or not, also there was no description of how the e-votes are to be calculated. Upon completion of the technical solution the National Electoral Committee presented the detailed description of e-voting procedure to the Riigikogu Constitutional Committee and the Constitutional Committee initiated a relevant amendment to the Act.

On 12 May 2005 the Riigikogu adopted the Local Government Councils Election Act Amendment Act which specified the provisions on e-voting. On the local government councils elections of 2005, e-voting was applied on the basis of the following provisions that entered into force on 18 September 2005:

§50. Electronic voting

(1) A voter may vote electronically on the webpage of the National Electoral Committee on days prescribed in clause 44(2)3). A voter shall vote himself or herself.

(2) A voter shall identify himself or herself on the basis of a certificate on identity documents permitting digital authentication.

(3) After identification of the voter, the general list of candidates in the electoral district of his or her residence shall be displayed on the webpage.

(4) The voter shall mark the name of the candidate in favour of whom he or she wishes to vote in the electoral district of his or her residence, and shall confirm the vote by giving a digital signature with the aid of a certificate permitting digital signing on the identity document.

(5) A notice that the vote has been accepted shall be displayed to the voter on the webpage.

(6) The voter may change his or her electronically given vote:
1) by voting again electronically at the time prescribed in clause 44(2)3) of this Act;
2) by voting with a ballot paper from the sixth day to the fourth day before election day pursuant to the procedure provided for in Articles 46-49 and Article 51 of this Act.

§53¹. Counting of electronically given votes

(1) In case of several electronically given vote (subsection 50(6)), the last vote shall be taken into account.

(2) After the close of electronic voting, the National Electoral Committee shall prepare a list of persons who voted electronically by polling divisions and shall forward the list to the county electoral committees not later than on the second day before the day of the referendum. A county electoral committee shall forward the list to division committees not later than on the day preceding the election day.

(3) If a voter has voted electronically, a member of the division committee shall make a notation in the polling list concerning voting electronically.

(4) If a voter has voted electronically as well as with a ballot paper, the ballot paper of the voter shall be taken into account. The division committee shall send an appropriate communication to the National Electoral Committee, whereby the National Electoral Committee shall annul the electronically given vote of the voter.

(5) If a voter has voted several times outside the polling division of his or her residence, and electronically, all envelopes with ballot papers of the voter as well as the electronically given vote shall be rejected. The division committee shall send an appropriate communication to the National Electoral Committee, whereby the National Electoral Committee shall annul the electronically given vote of the voter.

§54². Counting of electronically given votes

(1) National Electoral Committee shall verify the results of electronic voting on election day not before 7 p. m.

(2) At least one-half of the members of the National Electoral Committee, including the Chairman or Deputy Chairman of the Committee shall be present at the counting of votes.

(3) Voting results shall be verified in the National Electoral Committee in public, taking into account the restrictions provided for in subsection 54¹ (6) of this Act.

(4) The results of voting shall not be disclosed before 8 p.m.

(5) The National Electoral Committee shall immediately forward the results to the rural municipality or city electoral committee.

[RT I 2005. 47. 387 – entered into force 18.09.2005]

Art. 50 of the Local Government Councils Election Act was amended with subsection 6 which explicitly gave the voter the right to change his or her e-vote in three ways: voting again electronically during the advance polling, voting with ballot paper during the advance polling and voting with ballot paper on the election day. In the initial variant of the bill it was allowed to change the e-vote also on the election day up to 4 p.m. (the reason for such time limitation was to give the electoral committees time to exchange information and cancel repeated votes). The right to change one's e-vote creates a so-called virtual voting booth: e-voter who has e-voted under undesirable influence, can choose a moment when he or she is free to vote without outside influence. In order to guarantee freedom of voting, it is advisable to have the right to change one's vote on election day.

With the same amendment, the Penal Code was also changed to exclude changing electronically given votes from punishable offences.

§ 165. Election fraud

Voting more than once, except in the cases a voter changes his/her electronically given vote, or participating in an election or referendum without the right to vote or in the name of another person shall be punished by a fine of up to 300 fine units or by detention.

2.1.3. Constitutional Review of the Amendments of 2005

President of the Republic refused to proclaim the Local Government Councils Election Act on 25 May 2005, referring in the reasons for his decision to contradiction with the principle of uniformity of local government councils elections stipulated in subsection 156 (1) of the Constitution. According to the judgement of the President of the Republic, the violation of the principle of uniformity lied in the fact that not all voters were guaranteed equal opportunities for voting: the voter who can vote electronically has the right to change his or her electronically given vote by voting again electronically or with ballot paper, whereas the voters using other means of voting do not have such possibility to vote again.

After analysing the reasons given by the President of the Republic the Riigikogu decided to make amendments to the Act. The Riigikogu found that the possibility to change one's e-vote on election day can indeed be regarded as an advantage, it is possible that guaranteeing freedom of vote does not outweigh infringement of uniformity. All who vote during advance polls outside the polling division of their residence should formally be in uniform circumstances. If it were possible to change e-vote on election day, it could influence to change the vote on the basis of information received during the time between the end of advance poll (Wednesday evening) and election day. In practice the information having strong influence on election results has been disclosed just before election day.

2005. On 15 June 2005 the Riigikogu adopted the abovementioned amendment. A week later the President of the Republic again refused to proclaim the Act.

The Riigikogu again adopted the Act the President of the Republic refused to proclaim unamended on 28 June 2005. President of the Republic refused to proclaim the Act on 12 July and turned to the Supreme Court to declare the Act unconstitutional.

During the constitutional review proceedings all the arguments voiced during the legal debate over e-voting were presented again and deliberated. Therefore the Supreme Court resolution on e-voting as a whole is a good summary. In Appendix 2 of the Report the positions of the parties and the reasoning of the Court are set forth.

The Constitutional Review Chamber of the Supreme Court refused to satisfy the application of the President of the Republic. Pursuant to the Constitution, the President of the Republic was obliged to proclaim the Local Government Councils Election Act and the Act could enter into force.

2.2 Project Management

2.2.1. General Management

The electronic voting project was started in 2003. The term for the implementation of e-voting stipulated in the election acts was 2005.

Preconditions for the implementation of e-voting were:

1. the existence of legal basis;
2. widespread use of ID card that guaranteed all necessary means for e-voting – electronic identification of persons and digital signature;
3. the existence of electronic polling lists.

With the National Electoral Committee Resolution No. 75 of 25 July 2003, the e-voting project executive group was formed and the project leader elected, also the roles were distributed between the National Electoral Committee, executive group and project leader.

In accordance with the project organisation, the National Electoral Committee passed the more relevant decisions, the task of the executive group was making proposals and recommendations to the Committee and control the achieving of set objectives. Project leader was in charge of implementation of the project, summoned project groups formed of experts upon necessity, directed their work and checked the results.

As the first stage, the e-voting concept was completed. After that the safety analysis of the e-voting concept was carried out by working group formed of specialists. Proceeding from the recommendations of the safety analysis, changes were made to the concept and presented as a new document titled General Description of E-Voting.

In the beginning of 2004, the technical project of e-voting software was compiled. Together with the safety analysis, it was an essential preliminary document for proclaiming the public procurement for e-voting software. At the same time preparatory work for the acquisition of hardware-based safety module was going on. Module is an international standard product and it is necessary for carrying out the key management procedures of e-voting.

In March, three tenders were submitted to the public procurement of e-voting software. The Government of the Republic declared the offer of AS Cybernetica winner.

In autumn 2004 the software was ready and preparations were made for the first public pilot project, which was offering the possibility of e-voting in the polling of the residents of Tallinn. The polling took place on 24–30 January 2005; 703 voters participated and 697 votes were counted. The system worked without failures.

The final objective of the e-voting project was implementation of e-voting at the local government elections in autumn 2005. Preparatory work was completed – the e-voting system existed and had been tested, only the debated of constitutional issues had to be solved, which took place in September 2005.

2.2.2. Informing the Public

The National Electoral Committee organised a publicity campaign to give information about the elections, including e-voting. One of the aims of the campaign was to inform the public through different media channels that the elections are coming. TV, radio, printed materials (posters, flyers) and web portals were used.

The second aim of the campaign was to draw attention to e-voting as a new way of voting. Advertising channels where it was possible to discuss a subject in greater detail or arrive at instructions in an easier way were used for promoting e-voting. Therefore the advertisement was published in main web portals and besides that flyers with longer instructions on how to e-vote were printed.

Informing about the updating of ID card certificates and the possibility of restoring PIN codes was carried out in cooperation with Citizenship and Migration Board and AS Sertifitseerimiskeskus.

On 16 September the conference E-Voting – Possibilities and Challenges was held in cooperation with the E-State Academy and the National Electoral Committee. The purpose of the conference was to introduce in detail the e-voting system, its legitimacy and reliability. During the conference it was possible to try e-voting in practice in a class opened for that purpose.

As the debates that took place at the Riigikogu highlighted several risks that could accompany the new way of voting, it was planned to hold a panel discussion on the principles of Good E-Voting Practice (see Appendix 1) at the conference.

Before elections from September 26 until October 2 all persons eligible to vote were given the possibility to test e-voting (see chapter 3.3.2).

2.2.3. Training of Representatives of Political Parties as Observers

In August 2005 all larger political parties were called to take part in training course on observing e-voting. As e-voting was new way of voting that could not be observed according to the same principles as traditional voting, special approach to the observing of e-voting was necessary.

Training was started with introducing the e-voting system documentation and after that proceeded with a survey of concrete actions that were necessary for putting the e-voting system in working order (see the time schedule in section 3.3.31).

Besides representatives of political parties, other persons interested in e-voting system and auditors took part in the training.

It should be noted that in the beginning the interest of observers of electronic voting was relatively great but at the last activities only a few representatives of political parties were present.

2.2.4. Observation

51 interested persons from 16 different states wished to come to observe the implementation of unique in the world project of e-voting in local government elections in autumn 2005. The observers were officials from different states dealing with elections, members of third sector organisations and specialists of their field of science.

Official foreign observers were offered a two-day programme with introductory and explanatory reports and the possibility to observe elections in reality both in Tallinn and in Ida-Virumaa.

2.3 Budget

E-voting project was financed from the state project. In 2004 the National Electoral Committee was allocated 172 550 € and in 2005 223 700 € for the organisation of e-voting.

All means allocated from the state budget have not been spent. From August 2003 to the end of 2005, the e-voting project has cost a little more than 320 000 €. The largest expense categories have been:

- creating new software and adapting the existing one 166 175 €;
- acquisition of hardware 19 800 €;
- organisation of pilot project in Tallinn 20 450 €;
- information campaigns for Tallinn pilot project and local elections 26 850 €;
- salaries 31 960 €;
- documentation of procedures, compiling the handbook 17 900 €;
- system audit 12 150 €;
- organisation of conference 10 870 €.

The above figures on the expenses of e-voting are approximate as it is not possible to differentiate which are e-voting expenses and which are the expenses for ordinary voting.

3. Technical Solution

3.1. Envelope Method

8 different possibilities of voting have been in use at the local government councils elections. For years voting outside the polling division of residence has been practiced; it means that during the voting, the voter puts his or her vote into double envelope and the envelope is delivered to the voter's polling division of residence.

The general pattern of e-voting has been derived from the above mentioned voting outside the polling division of residence in Estonia. In these two voting methods, both the ways of checking that the vote has been cast only once and guaranteeing the anonymity of vote are similar.

In order to understand the e-voting system for guaranteeing the secrecy and singleness of vote, the envelope voting method used in Estonia should be described shortly. The latter gives the voter possibility to vote outside the polling division of the voter's residence in any rural municipality or city. A voter presents a document to be entered in the list of voters, and then receives the ballot and two envelopes. The inner envelope has no information about the identity of the voter and the ballot paper is put in it. The inner envelope is put into an outer envelope and the voter's details are written on it so that after the end of advance poll the envelope could be delivered to the voter's polling division of residence. There it is verified whether the voter has the right to vote, then the inner envelope is taken out and put unopened into the ballot box. The system guarantees that the voter's choice shall remain secret and recording the postal voting in the list of voters in the polling division of residence prevents voting more than once.

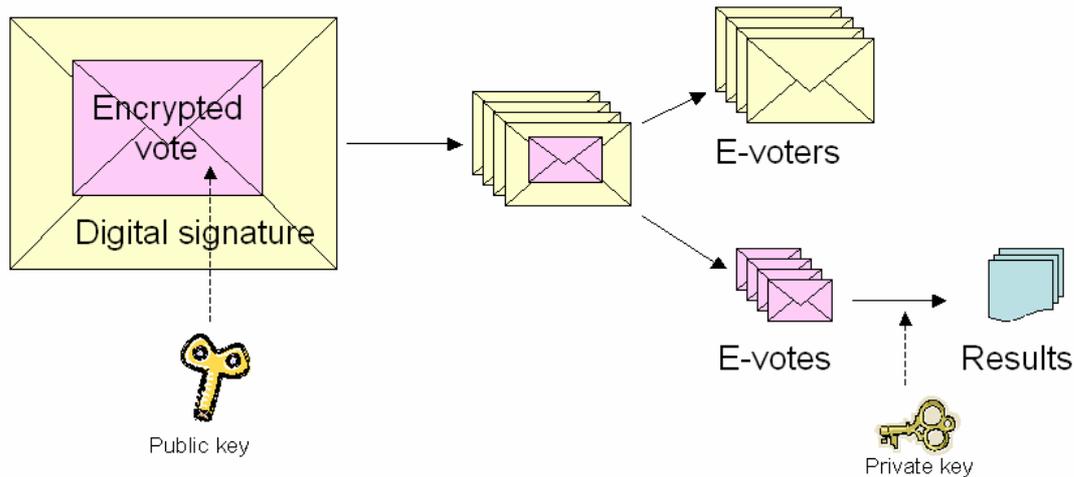


Figure 2 Envelope method at e-voting
 Source: *General Description of E-Voting, NEC 2004*

The application downloaded in the voter's computer during e-voting encrypts the vote before it is sent to the voting server through web connection. The encrypted vote can be regarded as the inner, anonymous envelope. After that the voter gives a digital signature to confirm his or her choice. By digital signing, the voter's personal data or outer envelope are added to the encrypted vote.

E-voting, like voting outside the polling division of residence, is possible only during advance polls. This is necessary in order to guarantee that in the end only one vote is counted for each voter. During the e-voting process, the voter's right to vote is checked but if the voter uses the possibility to cancel his or her vote by going to vote at the polling division during the advance poll, then it has to be guaranteed that finally only one vote is counted for each voter. For that, all polling stations are informed of the e-voters on their list of voters after the end of advance poll and before the election day on Sunday. If it is found at the polling division that the voter has voted both electronically and with paper ballot, the information is sent to the National Electoral Committee who cancels that voters e-vote. Before the verification of voting results in the evening of the election day, the encrypted votes and the digital signatures with personal data or inner and outer envelopes are separated. Then the e-votes are opened and counted. The system opens the votes only if they are not connected to personal data.

3.2. System Architecture

If you want to describe only the part of e-voting of the whole process of organising the elections, it would be relatively small. The system uses existing information systems – Population Register as polling list, National Electoral Committee information system for the collection and publication of information on candidates and voting results and the infrastructure of AS Sertifitseerimiskeskus for checking ID card certificates. From the outside, the e-voting system gets polling lists (from the Population Register) and lists of candidates (from the elections information system), it itself issues lists of e-voters and e-voting results.

Voting has two parties – the giver of the vote and the receiver of the vote. In the case of e-voting, they are the voter's computer into which the voter's application is downloaded and the server pool administered by the national electoral committee.

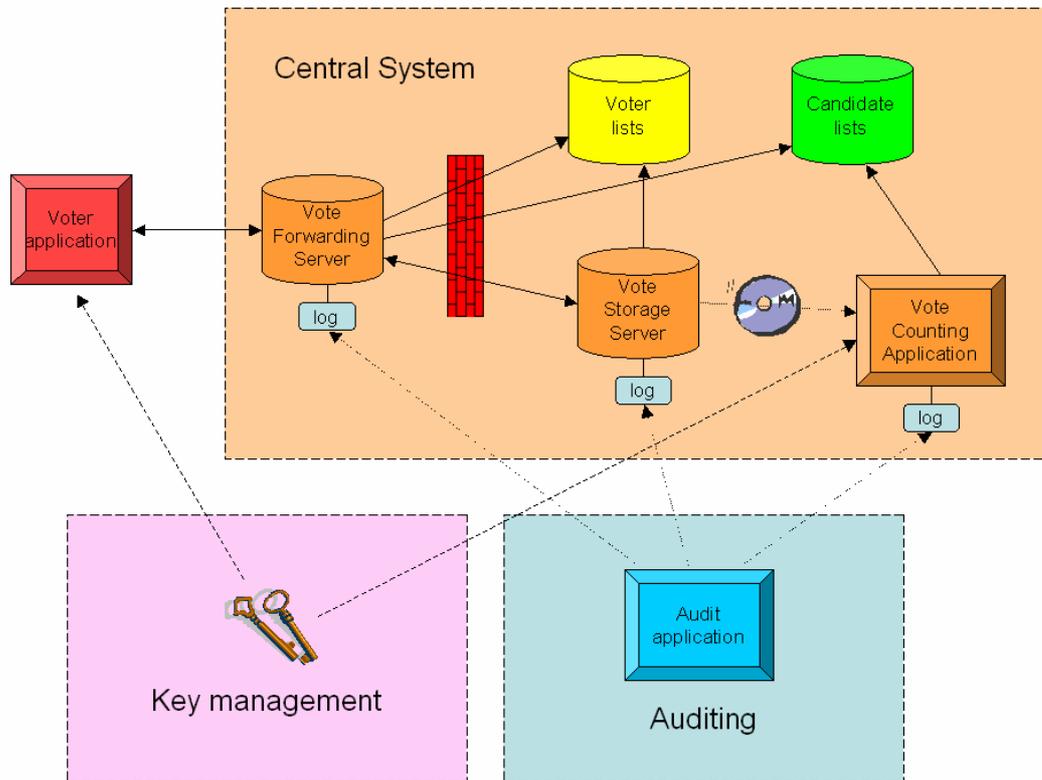


Figure 3 General architecture of e-voting system

Source: *General Description of E-Voting, NEC 2004*

Components of the Central System are depicted in the orange field of the figure:

1. Vote Forwarding Server (VFS) – authenticates the voter with the help of ID card, verifies his or her right to vote, displays the voter the candidates of his or her electoral district and accepts the voter's encrypted and digitally signed vote. It forwards this vote immediately to Vote Storage Server and forwards the voter the confirmation of the receiving of vote. Finishes work after the end of e-voting.
2. Vote Storage Server (VSS) – receives e-votes from VFS and stores them. When the e-voting has ended, removes repeated votes, cancels the votes of persons with no right to vote and receives and performs cancellations of e-votes. Finally it separates encrypted votes from digital signatures with personal data and prepares them for Vote Counting Application.
3. Vote Counting Application (VCA) – movable regime component where the encrypted votes from which digital signature has been removed are transferred on CD. VCA uses private key of the system, sums up the votes and issues e-voting results.

VFS is the only component of the Central System that is directly accessible through the Internet. All other components are protected by firewall and the access to them is possible only via VFS.

Asymmetric cryptography is used to guarantee the secrecy of votes. A pair of keys is generated for the system in a special safety module so that its private component never leaves it. Public component of the pair of keys is integrated into the voter application and it is used for encrypting the votes. Private component of the pair of keys is used in the Vote Counting Application for opening the votes on election day evening. The National Electoral Committee can open the votes, i.e. use the private component, only collegially. After the end of the period of dealing with the complaints the private key is destroyed.

During auditing of the system possible complaints connected with e-voting are solved, using the information from the Central System log. In its different stages the e-voting system

produces different logs on received, cancelled, counted, invalid and valid votes. Audit Application enables to establish what happened to an e-vote given by a concrete person without revealing the voter's choice.

General description of the e-voting system is available at the National Electoral Committee web page at the address: <http://www.vvk.ee/elektr/docs/Yldkirjeldus-eng.pdf>.

3.3. Implementation of E-Voting System

3.3.1. Pilot Project in January 2005¹⁰

In cooperation with the town of Tallinn the completed e-voting system was used in January 2005 at the polling of the inhabitants of Tallinn about the location of the Freedom Monument to be erected in Tallinn. The system was implemented as a whole, including the possibility to change one's vote, giving priority to ballot paper and public opening of votes with the e-voting system keys divided between the members of the committee.

It was possible to vote at public polling divisions with ballot paper or electronically via the web page www.valimised.ee. Within the framework of the pilot project, 703 inhabitants of Tallinn, i.e. 13.7% of all those who participated in the poll, used the possibility of e-voting. There were no technical failures.

The inhabitants of Tallinn were posed the following question: "Where in your opinion should the Freedom Monument be located?" and the answers were "In the region of the Freedom Square" and "In some other place".

The wording of the question caused public criticism and the problem itself probably was not important enough to motivate more inhabitants of the town to vote. This also explains the low turnout (1.5% of the inhabitants of Tallinn).

The result of e-voting did not differ significantly from the result of votes on ballot paper.

3.3.2. Public Testing of E-Voting Immediately Before the Local Government Council Elections

Between 26 September and 2 October 2005 all persons eligible to vote were given the possibility to test e-voting in order to encourage people to solve the problems that might emerge (acquisition of necessary software, updating expired ID card certificates, renewal of PIN codes etc.) before the days of real e-voting.

The system used for public testing was as similar as possible to the system used on the days of actual e-voting: a person had to identify himself or herself with ID card, the list of candidates was displayed and the choice had to be confirmed with digital signature. The candidates had been invented for public testing, the names of political parties and election coalitions that actually participated in the elections were not used.

3.3.3. Local Government Council Elections in October 2005

¹⁰ Information about the pilot project can be found at the following web addresses: <http://port.andmevara.ee/vabadussammas/statistika.html>, <http://www.tallinn.ee/est/g2248s20160>.

3.3.3.1. Calendar of Events Connected with E-Voting

Aug 18 – training of auditors and observers started
Sept 8 – generating of web server and pairs of keys for coded signature (*)
Sept 9 to 12 – loading of list of candidates and participants for test voting and the list of actual polling divisions, adjustment of servers for test voting
Sept 13 – generating of the pair of keys of the e-voting system, distribution of keys between the members of NEC (*)
Sept 16 – participants of e-voting conference could try e-voting
Sept 22 – loading of lists of e-voters for public test voting, tuning of system for e-voting
Sept 26 – start of public test voting
Oct 2 – end of test voting
Oct 3 – counting of test votes
Oct 5 – audited installing of operation systems (*)
Oct 6 – loading of lists of voters, tuning of servers and voter application (*)
Oct 7 – transport of servers to server rooms (*)
Oct 10 at 9 am – loading of updates to lists of voters, beginning of e-voting (*)
Oct 10 and 11 at 5 pm – making changes to the lists of voters (*)
Oct 12 at 8 pm – end of e-voting, transport of servers (*)
Oct 13 – printout of the list of e-voters (*)
Oct 16 at 5.30 pm – compilation of annulment list, annulment of e-votes (*)
Oct 16 at 7 pm – counting of e-votes and signing the results (*)

(*) activity where auditing/observation was mandatory

E-voting at local government councils elections started on 10 October at 9 am and ended on 12 October at 8 pm on the web page www.valimised.ee.

3.3.3.2. Evaluation from the Technical Perspective

From the point of view of the central system of voting, e-voting took place without greater disruptions. In the morning of the first day of voting the publication of the references to the right web page in info servers was delayed for some minutes which gave an erroneous impression that the beginning of voting was delayed. On the third voting day voting was disturbed for half an hour because of the malfunction of the validity confirmation service of AS Sertifitseerimiskeskus.

System monitoring was launched for the period of e-voting in order to discover possible security problems. There were no attacks that would have endangered the operation of the system.

Server room with very strict security and guarding requirements concerning the access to e-voting hardware was used for secure accommodating of the central system servers.

Overwhelming majority of e-voters (99.1%) used the Windows platform, Linux was used by 0.72% and Macintosh 0.18 % of e-voters (Source: Tarvi Martens. E-Voting Report).

4. Analysis of E-Voting Results

As this was the first experience of e-voting and there were relatively few e-voters, all conclusions drawn on the basis of this experience should be treated with certain reservations. General conclusion is that the implementation of e-voting at the local government councils elections of 2005 was successful. The auditors confirmed that the e-voting system worked correctly, also there were no failures or problems that could have shattered people's trust in the honesty of e-voting and the reliability of the system. No complaints connected with e-voting were submitted to the National Electoral Committee or the Supreme Court.

The analysis of e-voting results is based on existing facts (source: National Electoral Committee) and the following polls conducted before and after the local government councils elections of 2005:

- research centre Faktum "E-voting and the reduction of alienation"; the polling ordered by the Department of Economic and Social Information of the Chancellery of the Riigikogu (DESICR) took place on 5–22 December 2003, the sample was formed on the basis of actual voting behaviour, i.e. persons who had taken part in all elections and in some elections and persons who had never taken part in elections were included in the sample. Reasons for the respondents' voting behaviour and the possibilities and readiness for e-voting were studied;
- research centre Faktum "Attitude of the population towards e-voting". The polling ordered by DESICR was conducted on 4–14 February 2004;
- research centre Faktum "Attitude of the population towards e-voting". The polling ordered by DESICR was conducted from 26 January to 23 February 2005. Omnibus polling where 1700 persons of voting age proportionally from all over Estonia were polled;
- "E-voting poll" of research centre ES Turu-uuringute AS. Ordered by DESICR. Polling was conducted from 27 May to 3 June 2005. Omnibus poll where 966 persons of voting age from all over Estonia were polled¹¹;
- Faktum's polling within the framework of the project "Democracy and National Interests. Polling was ordered by Estonian Open Society Institute. Project was supported by Open Estonia Foundation. It was an omnibus polling which was conducted from 19 October to 2 November 2005. Sample size was 936;
- Report to the Council of Europe "E-Voting in Estonia at the Local Government Councils Elections of 2005". Authors Fabian Breuer ja Alexander H. Trechsel, European University Institute.¹² The report is based on a sociological polling conducted after e-voting. The sample consisted of 939 persons with the right to vote, it was put together according to actual voting behaviour, 315 e-voters, 319 voters at the polling division and 305 persons who did not take part in voting were included on the sample. The main purpose of the polling was to find out the reasons for participating or not participating in e-voting, and also the effect of e-voting on political turnout and election results. The following reference in the report: *Source: CoE +eGA*.

Certainly the conclusions drawn are not exclusive or extensive, but the collected facts and the results of polls with preliminary interpretation form a basis for future scientific research.

4.1. Results of E-Voting

¹¹ Polling results are available on DESICR home page:

<http://www.riigikogu.ee/?id=36584>

¹² Report for the Council of Europe. E-voting in the 2005 local elections in Estonia. Authors Fabian Breuer and Alexander H. Trechsel, European University Institute. Project leaders Prof. Dr. Alexander H. Trechsel, European University Institute, Florence, Italy & Director of the e-Democracy Centre (e-DC), University of Geneva, Switzerland; Ivar Tallo, Director of the e-Governance Academy, Tallinn, Estonia. Florence, March 6 2006

About 2% of all votes through the Internet. Keeping in mind that it was the first time it was possible to e-vote, that ID card readers most probably are not very widespread, that in the beginning of 2005 a large portion of ID card certificates expired and needed updating and that there are not many of those who use e-services with the help of ID card, it is a good result.

Table 11 Main Statistics of E-Voting
Source: National Electoral Committee

<i>Number of persons with the right to vote</i>	<i>1059292</i>
Votes:	502504
valid (with e-votes)	496336
invalid	6168
Voter turnout	47%
E-votes given	9681
incl. repeated e-votes	364
Number of e-voters	9317
E-votes counted	9287
E-votes cancelled	30
Percentage of e-votes among all votes	1.85%
Advance voter turnout (% of all voters)	24%
Percentage of e-votes among votes of advance polls	8%
Number of e-voters who used ID card electronically for the first time	5774
Percentage of e-voters who used ID card electronically for the first time	61%

In order to take part in e-voting, it was necessary to have access to a computer with Internet connection, ID card with valid certificates and PIN codes and a card reader. There is information about the possibilities to use the Internet and the spread of ID cards but no reliable data on the distribution of card readers in Estonia.

At the local government councils elections of 2005 about 2% of the voters, i.e. 9317 persons with the right to vote used the possibility of Internet voting, giving a total number of 9681 e-votes. 9287 e-votes were taken into account in the verification of election results: during the changing of e-votes, 364 e-votes were given and the e-voters also voted with 30 ballot papers. When the repeated votes were counted, the vote given last was taken into account. When the vote was also cast on ballot paper, this was taken into account in verifying the election results and the e-vote was cancelled.

To guarantee the freedom of voting, it was allowed to change one's e-vote with an e-vote or ballot paper. Changing of e-votes was allowed only on sixth to fourth day before the election day so that no advantages would be given to e-voters in comparison to other advance poll voters outside the polling division of their residence. The possibility to change one's e-vote on election day would have created a situation where e-voters in comparison to other voters would have had a substantial and insufficiently justified advantage in expressing their electoral decision: they could have changed their vote on the basis of information received between Thursday and Saturday.

4.2. Digital Gap Issue

The main problem is whether Estonia’s experience supports the presumption that the possibility of e-voting would increase the so-called digital gap, i.e. the social inequality proceeding from access to the Internet and the possibility to use the services offered on the Internet.

Attitude towards e-voting has been mostly favourable since the beginning of the e-voting project.¹³ Positive attitude did not change also after the implementation of actual e-voting.

In November 2005 (after the implementation of e-voting at the local government councils elections) research centre Faktum conducted a polling of the population which included questions about last local government elections. Faktum has investigated the general attitude of the public towards e-voting also in February 2004 and February 2005. The number of persons with the right to vote who are ready to vote through the Internet has steadily increased; at the same time the number of those who in any case would like to vote at the polling division is diminishing.

Table 12 Attitude Towards E-Voting in 2004-2005

Source: Faktum polling

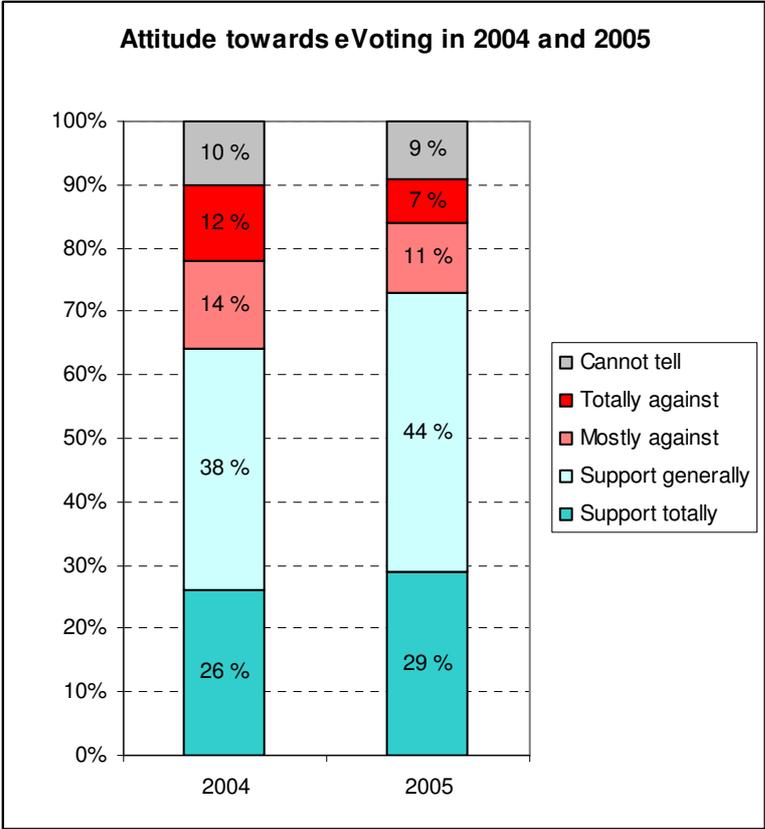
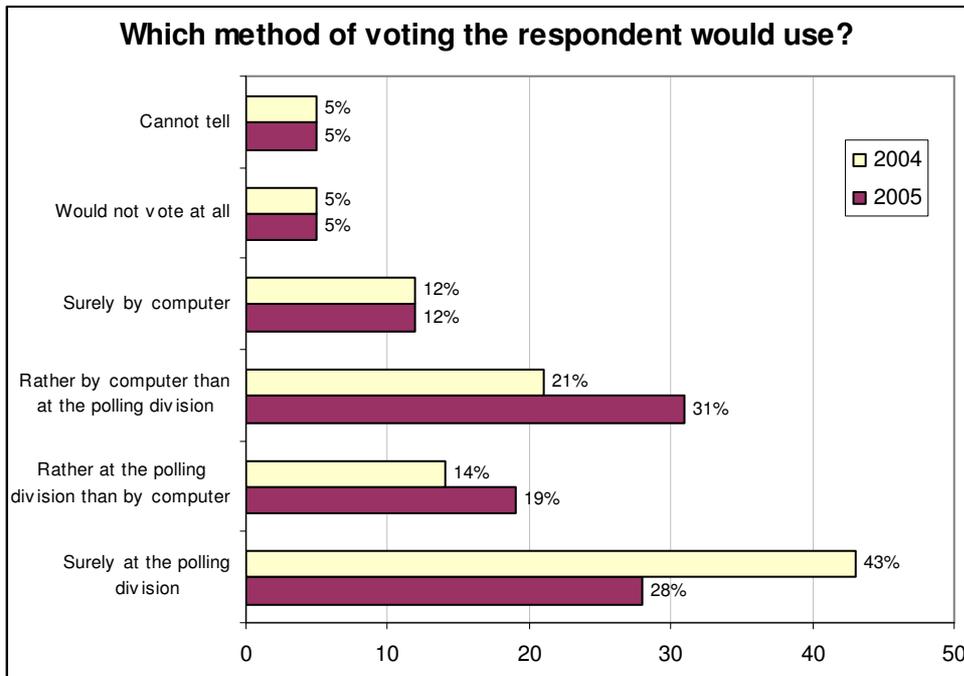


Table 13 Preferences in the Way of Voting in 2004–2005

Source: Faktum polling

¹³ Estonian public defines e-voting as voting through the Internet, the media has operated with this meaning and public polls, too, have proceeded from this definition. Among other things it was claimed in the debates at the Riigikogu that as in the polls there was no question about voting via the Internet, but about e-voting, it should be presumed that the respondents expressed their support to machine voting and other forms of electronic voting and not to voting through the Internet. Most likely this is not the case here.



Implementation of e-voting increases social inequality in the case the representation of the people who do not have the possibility to e-vote in representative bodies decreases because of that. The equality of the possibility of being represented would clearly decrease if in connection with e-voting the density of polling divisions and the number of voting days were considerably reduced. The density of polling divisions remained the same at the local government councils elections of 2005, the number of days for voting was also not reduced. The number of days when it is possible to vote has actually been increased at two last elections because since the elections of the European Parliament in 2004 it possible to vote at the polling division since the thirteenth day before the election day.

People with higher level of education have more favourable attitude towards e-voting than people with lower level of education; there were more people with higher education also among actual e-voters. On the basis of existing studies it may be said that the difference in attitude and actual participation is relatively small, around 10% (see tables 14 and 15).

Table 14 Relationship between the Level of Education and Attitude Towards E-Voting

Source: Faktum polling in February 2005

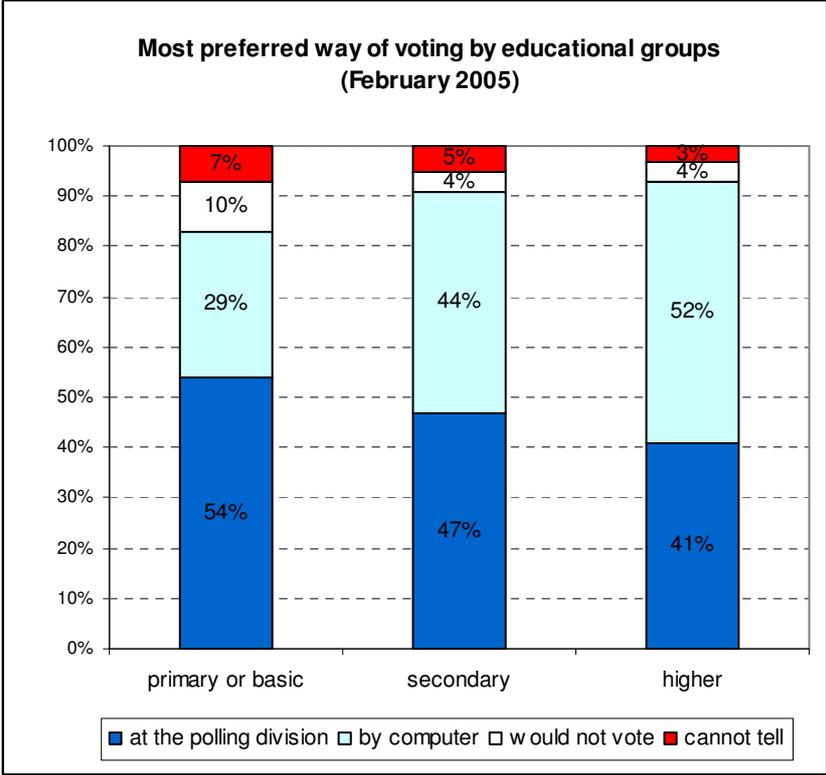
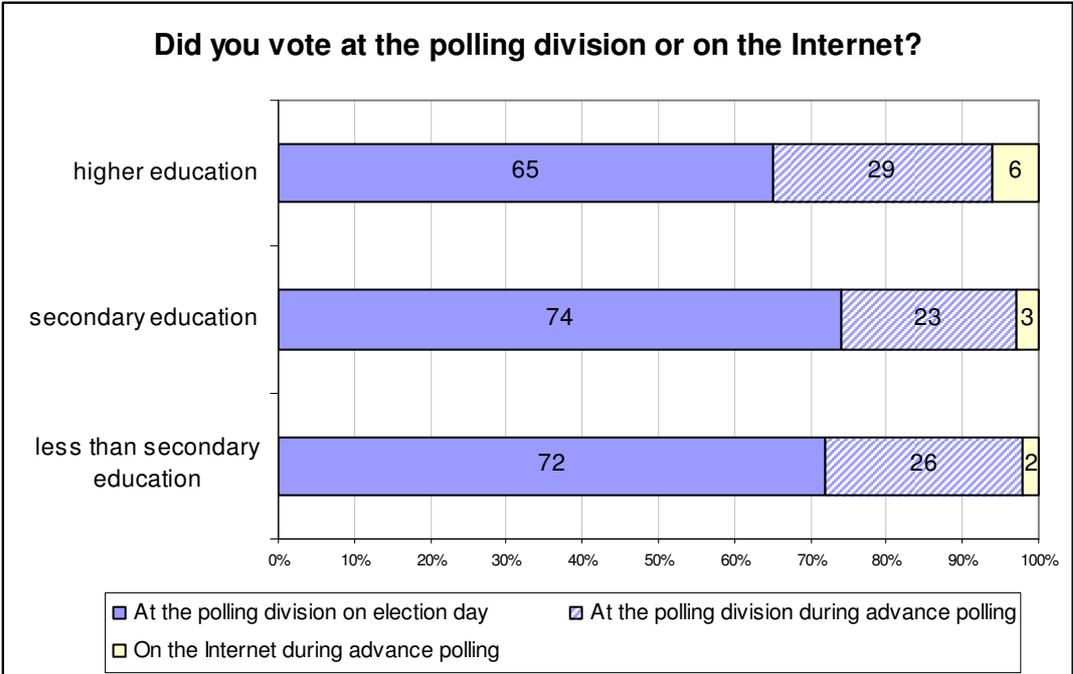


Table 15 Relationship between the Level of Education and Actual E-Voting

Source: Faktum polling in October and November 2005



The comparison of the attitude and actual voting behaviour of different age groups shows that among younger people there are more those who support the possibility of e-voting and here the differences between different age groups are great. There are more than two times more supporters of e-voting among the 15–34 year olds than among over 50 year olds (see Table 16). The polling on actual voting behaviour does not show such large differences but the result of polling must be regarded cautiously because of the small sample group (see Table

17). Unfortunately there is no data on the percentage of all voters in the same age groups who used the possibility of e-voting, the percentage of those who used other possibilities of advance polls and the percentage of those who voted at polling division on election day.

There are data on how the e-votes were distributed between different age groups. 62% of all e-voters were in the age group 30–59 years; 18–29 years old voters formed 27.5% of e-voters and over 60 year olds around 10%. It must be noted that in the age group 30–59 there are considerably more 30rs old e-voters than 50–59 years old e-voters (see Table 18).

Table 16 Relationship between Age and Attitude Towards E-Voting

Source: Faktum polling in February 2005

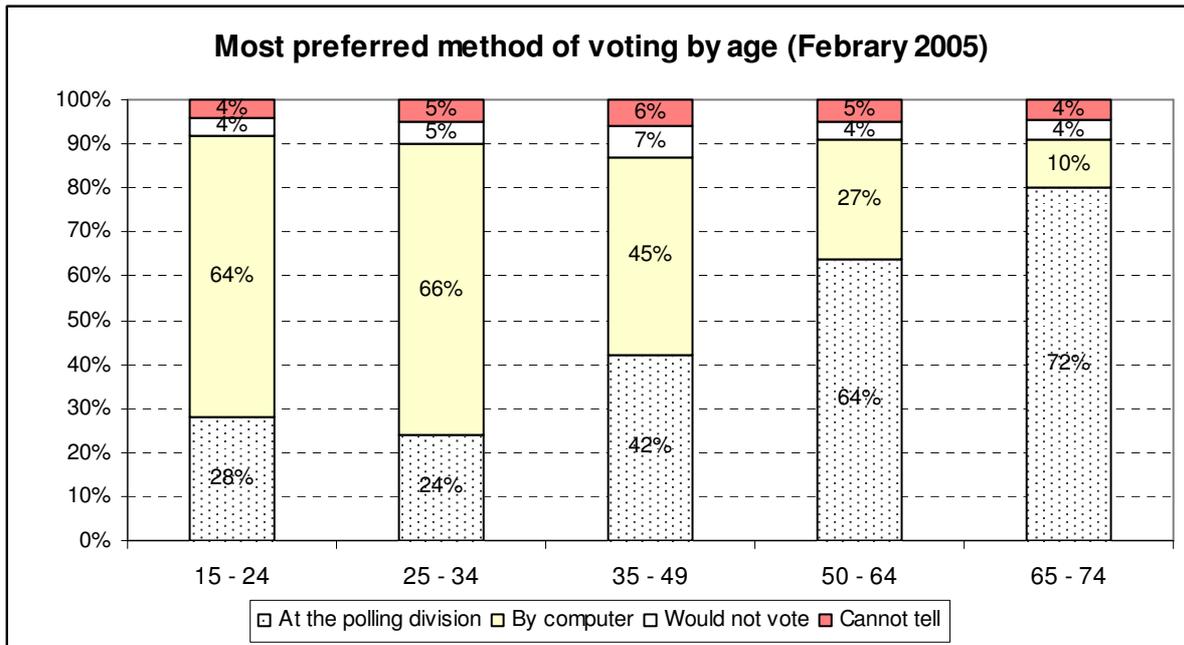


Table 17 Relationship between Age and Actual E-Voting

Source: Faktum polling in October and November 2005

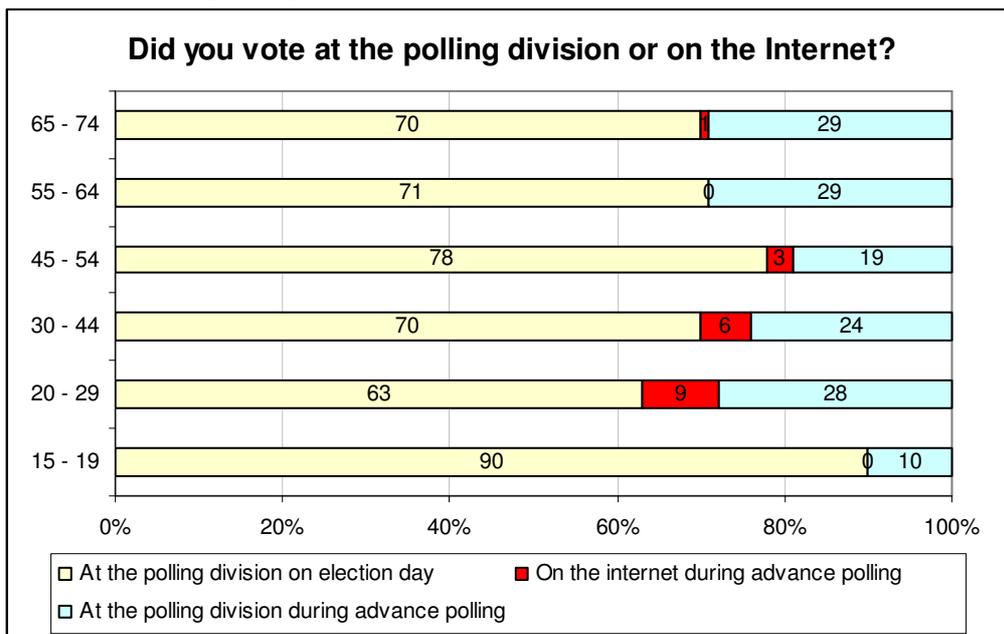


Table 18 E-Voters by Narrower Age Groups

Source: National Electoral Committee

	women	%	men	%
up to 29	1062	25,0	1512	30,0
30 - 34	542	12,8	908	18,0
35 - 39	506	11,9	688	13,6
40 - 44	497	11,7	553	11,0
45 - 49	451	10,6	433	8,6
50 - 54	362	8,5	345	6,8
55 - 59	278	6,5	228	4,5
over 60	547	12,9	375	7,4
TOTAL	4245	100,0	5042	100,0

Data about the sex of e-voters shows that in general there are more e-voters among men (see Table 19), but comparison of narrower age groups shows that when the age increases the difference between sexes diminishes and among more than 40 years old e-voters there are more women than men (see Table 18).

Table 19 E-Voters by Sex

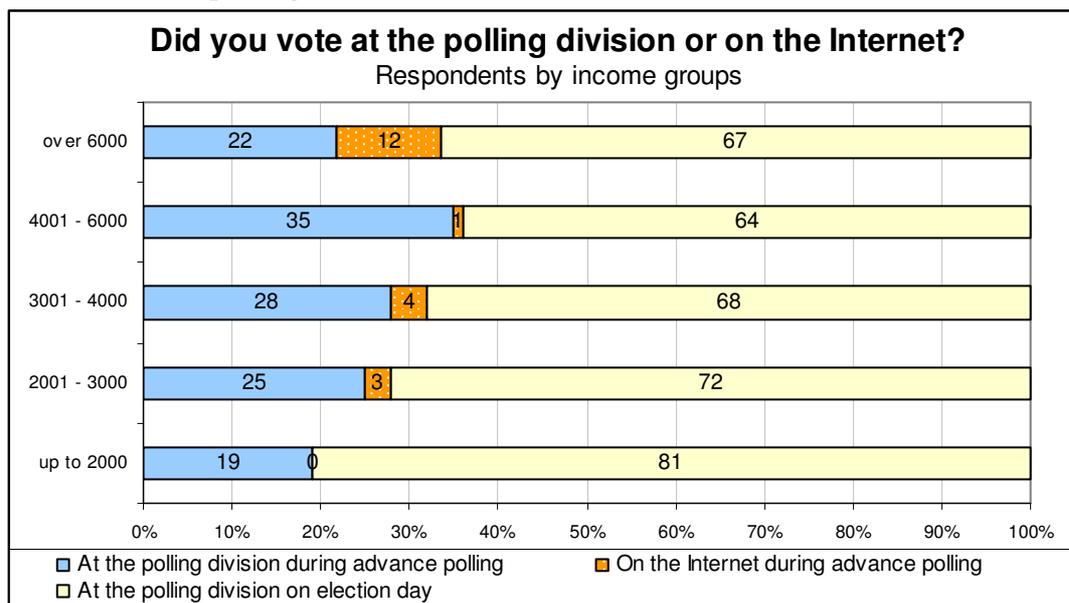
Source: National Electoral Committee

gender	votes	%
Women	4245	45,7
Men	5042	54,3
TOTAL	9287	100

Faktum's polling also included questions necessary for linking the use of the possibility of e-voting and the income of the respondent. The result received (although again on the basis of relatively small sample) confirms the hypothesis that wealthier people use the possibility of e-voting and generally the possibility of advance poll more. The percentage of people with the smallest income is greatest among the voters at the polling division on election day (see Table 20).

Table 20 Relationship between the Level of Income and Actual E-Voting (income in crowns)

Source: Faktum polling in October and November 2005



As a rule, linking the possible e-voting turnout with place of residence proceeds from the hypothesis that the e-voting possibility is most used in large cities and less in rural regions. The survey made on behalf of Council of Europe showed that percentages of e-voters in rural areas and in cities are similar and place of residence is not decisive factor (see Table 21).

Table 21 Frequency of Political Participation and Mode of Vote in 2005

Source: CoE +eGA

Type of settlement	Type of political participation			
	vo vote	vote at polling place	e-vote	total
Urban	67,9%	67,6%	70,2%	68,6%
Rural	32,1%	32,4%	29,8%	31,4%
Total	100,0%	100,0%	100,0%	100,0%
N ^o of respondents	(305)	(318)	(315)	(938)

When we look at the absolute number of e-voters by towns and rural municipalities, we can see that the largest number of e-votes was given in Tallinn, Tartu and Pärnu. Viimsi rural municipality ranked fourth by the absolute number of e-votes (see Table 23). When we compare the percentage of e-votes in all votes cast in a municipality or town, it can be seen that at the top there is not Tallinn or Tartu but the tiny municipality of Ruhnu with 11.1%. Neighbouring municipalities of the capital follow: Harku municipality with 3.97% and Saku municipality with 3.72%. Of towns, Kärđla has the highest, 10th place with 3%. Tallinn ranks 15th and Tartu 29th, respectively with 2.75% and 2.42% of all votes. If we compare the percentage of towns and municipalities, the differences are not really great (see Table 25). Among 240 districts, there were only 18 with no e-voters.

Table 22. The Percentage of E-Voters among the Eligible Voters by Counties and in Tallinn and in Tartu

Source: National Electoral Committee

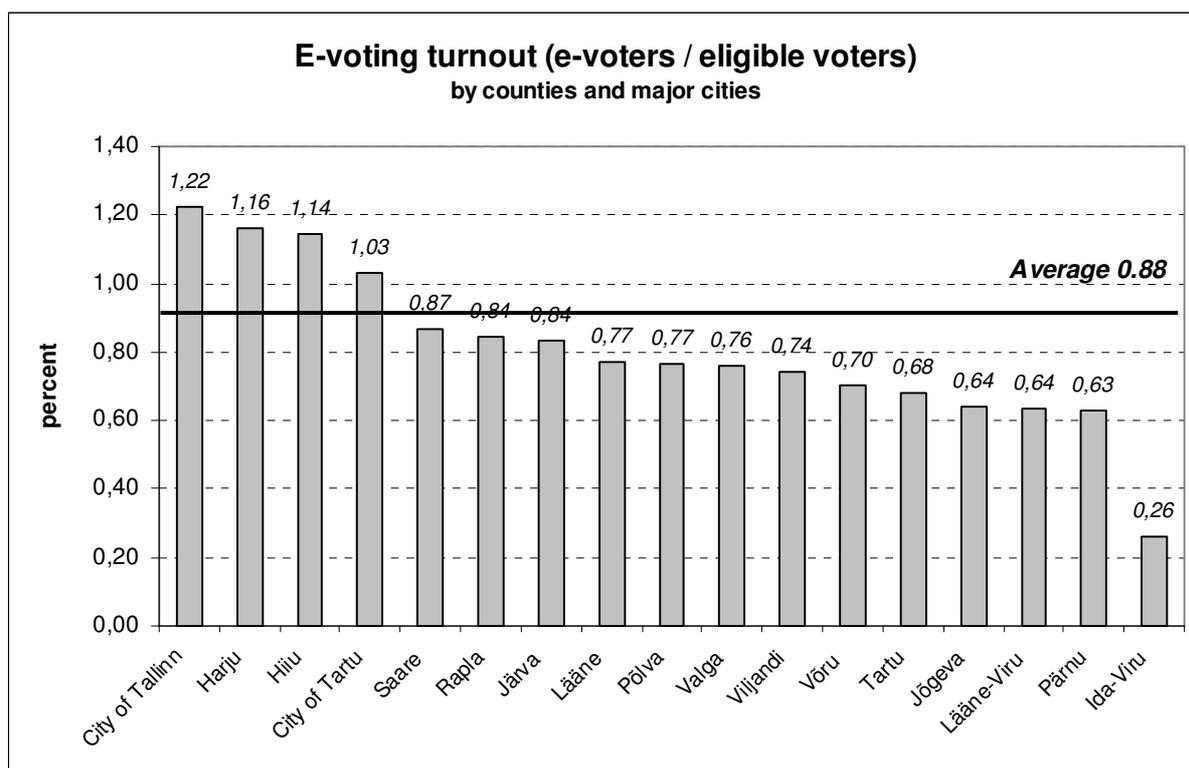


Table 23. The Percentage of E-Voters among the Persons Who Participated in Voting by Counties and in Tallinn and in Tartu

Source: National Electoral Committee

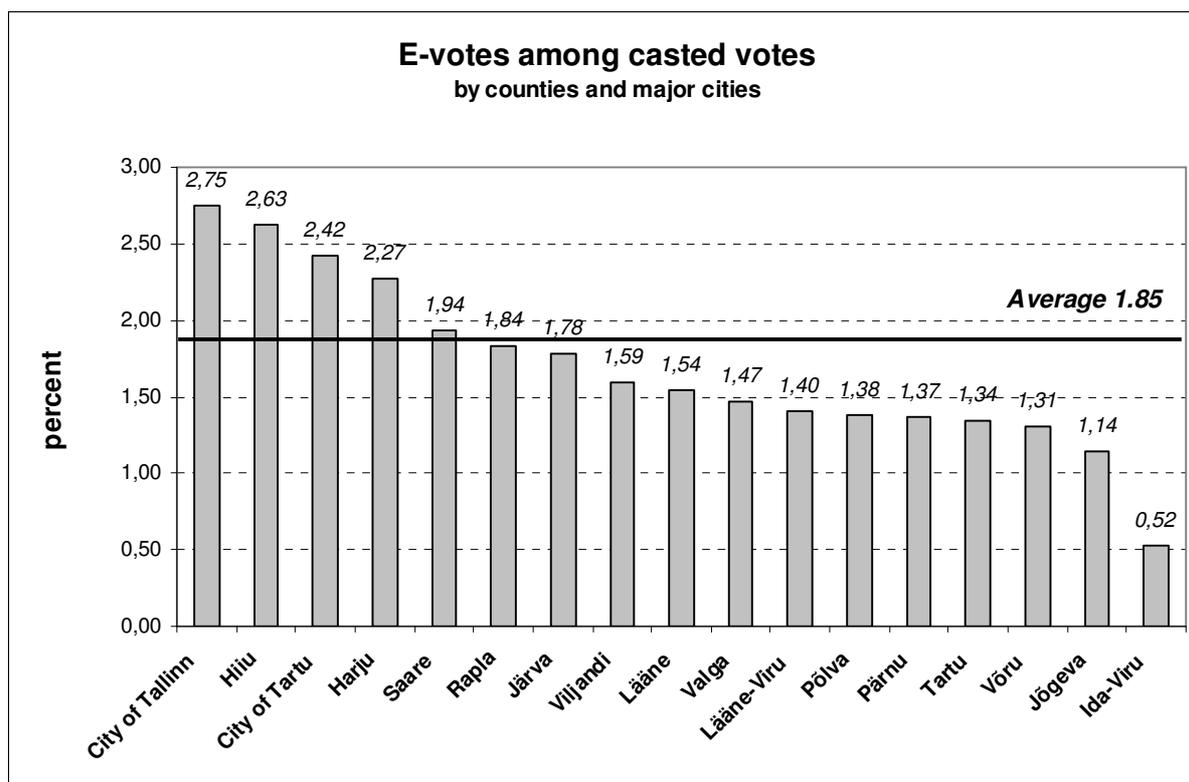


Table 24 Number of E-Votes in Towns and Rural Municipalities (? 40 e-votes)

Source: National Electoral Committee

1. City of Tallinn:	3833	16. Türi municipality:	74
2. City of Tartu:	786	17. Town of Saue:	70
3. Town of Pärnu:	250	18. Rae municipality:	68
4. Viimsi municipality:	179	19. Town of Valga:	67
5. Town of Kuressaare:	135	20. Town of Paide:	64
6. Town of Viljandi:	129	21. Kuusalu municipality:	62
7. Harku municipality:	124	22. Town of Kohtla-Järve:	59
8. Saku municipality:	107	23. Town of Põlva:	57
9. Town of Narva:	103	24. Jõelähtme municipality:	52
10. Saue municipality:	97	25. Märjamaa municipality:	47
11. Town of Rakvere:	95	26. Anija municipality:	45
12. Town of Võru:	93	27. Suure-Jaani municipality:	42
13. Town of Keila:	88	28. Otepää municipality:	42
14. Town of Haapsalu:	79	29. Town of Põltsamaa:	42
15. Rapla municipality:	78		

Table 25 Number of E-Votes in Polling Divisions (≥ 40 e-votes)

Source: National Electoral Committee

1. Viimsi mun., Dvn. No. 2:	100	3. Harku mun., Dvn. No. 1:	82
2. City of Tallinn, Dvn. No. 9:	98	4. Viimsi mun., Dvn. No. 1:	78

5. Town of Saue, Dvn. No. 1:	70	25. City of Tallinn, Dvn. No. 108:	48
6. City of Tallinn, Dvn. No. 24:	69	26. Town of Keila, Dvn. No. 2:	48
7. City of Tallinn, Dvn. No. 31:	68	27. City of Tartu, Dvn. No. 18:	47
8. Saue mun, Dvn. No. 2:	65	28. City of Tallinn, Dvn. No. 18:	47
9. City of Tallinn, Dvn. No. 102:	56	29. City of Tartu, Dvn. No. 3:	46
10. City of Tallinn, Dvn. No. 34:	55	30. City of Tallinn, Dvn. No. 23:	46
11. City of Tallinn, Dvn. No. 20:	55	31. City of Tallinn, Dvn. No. 100:	46
12. City of Tallinn, Dvn. No. 15:	55	32. City of Tallinn, Dvn. No. 27:	45
13. City of Tallinn, Dvn. No. 127:	55	33. City of Tallinn, Dvn. No. 114:	45
14. City of Tallinn, Dvn. No. 104:	52	34. City of Tallinn, Dvn. No. 111:	45
15. City of Tartu, Dvn. No. 8:	51	35. City of Tallinn, Dvn. No. 83:	44
16. City of Tartu, Dvn. No. 20:	51	36. City of Tallinn, Dvn. No. 32:	44
17. City of Tallinn, Dvn. No. 103:	51	37. City of Tallinn, Dvn. No. 116:	43
18. City of Tartu, Dvn. No. 19:	50	38. City of Tallinn, Dvn. No. 107:	43
19. City of Tallinn, Dvn. No. 101:	50	39. City of Tallinn, Dvn. No. 86:	42
20. Saku mun, Dvn. No. 2:	50	40. City of Tallinn, Dvn. No. 84:	42
21. City of Tartu, Dvn. No. 13:	49	41. Town of Põltsamaa, Dvn. No. 1:	42
22. City of Tallinn, Dvn. No. 38:	49	42. Karksi mun., Dvn. No. 1:	40
23. City of Tartu, Dvn. No. 17:	48	43. Town of Keila, Dvn. No. 1:	40
24. City of Tartu, Dvn. No. 15:	48		

Table 26 The Percentage of E-Votes of Total Votes Cast in Rural Municipalities and Towns
Source: National Electoral Committee

1. Ruhnu municipality	11.11	29. City of Tartu	2.42
2. Harku municipality	3.97	30. Leisi municipality	2.38
3. Saku municipality	3.72	31. Kuusalu municipality	2.38
4. Vastse-Kuuste municipality	3.64	32. Saarepeedi municipality	2.33
5. Käina municipality	3.53	33. Tootsi municipality	2.33
6. Suure-Jaani municipality	3.38	34. Raikküla municipality	2.27
7. Viimsi municipality	3.30	35. Rapla municipality	2.26
8. Saue municipality	3.17	36. Alatskivi municipality	2.26
9. Meeksi municipality	3.11	37. Paikuse municipality	2.25
10. Town of Kärkla	3.00	38. Tõlliste municipality	2.21
11. Town of Saue	2.87	39. Keila municipality	2.21
12. Nõo municipality	2.85	40. Taebala municipality	2.20
13. Emmaste municipality	2.85	41. Rae municipality	2.20
14. Maidla municipality	2.80	42. Oru municipality	2.17
15. City of Tallinn	2.75	43. Ülenurme municipality	2.16
16. Town of Kuressaare	2.72	44. Kärkla municipality	2.15
17. Lümända municipality	2.68	45. Kolga-Jaani municipality	2.14
18. Jõelähtme municipality	2.67	46. Hummuli municipality	2.10
19. Puka municipality	2.62	47. Anija municipality	2.09
20. Kiili municipality	2.58	48. Padise municipality	2.03
21. Juuru municipality	2.54	49. Iisaku municipality	1.98
22. Kõlleste municipality	2.54	50. Mõniste municipality	1.96
23. Kaisma municipality	2.54	51. Otepää municipality	1.93
24. Town of Põlva	2.53	52. Town of Põltsamaa	1.93
25. Kernu municipality	2.45	53. Pühalepa municipality	1.92
26. Karksi municipality	2.44	54. Kohila municipality	1.91
27. Town of Keila	2.44	55. Town of Viljandi	1.90
28. Paide municipality	2.43	56. Toila municipality	1.89
		57. Võru municipality	1.87

58. Rakvere municipality	1.86	Average in Estonia: 1.85 %
59. Türi municipality	1.85	
60. Palamuse municipality	1.85	

When researching the issue of digital gap, it should be also studied where exactly the e-votes were given: at workplace, at home, in public voting place or abroad. On the basis of the results of research ordered by the Council of Europe it is known that most votes were given at home and workplace was the second voting place by popularity (table 27).

Table 27 E-voting places:

Source: CoE+eGA

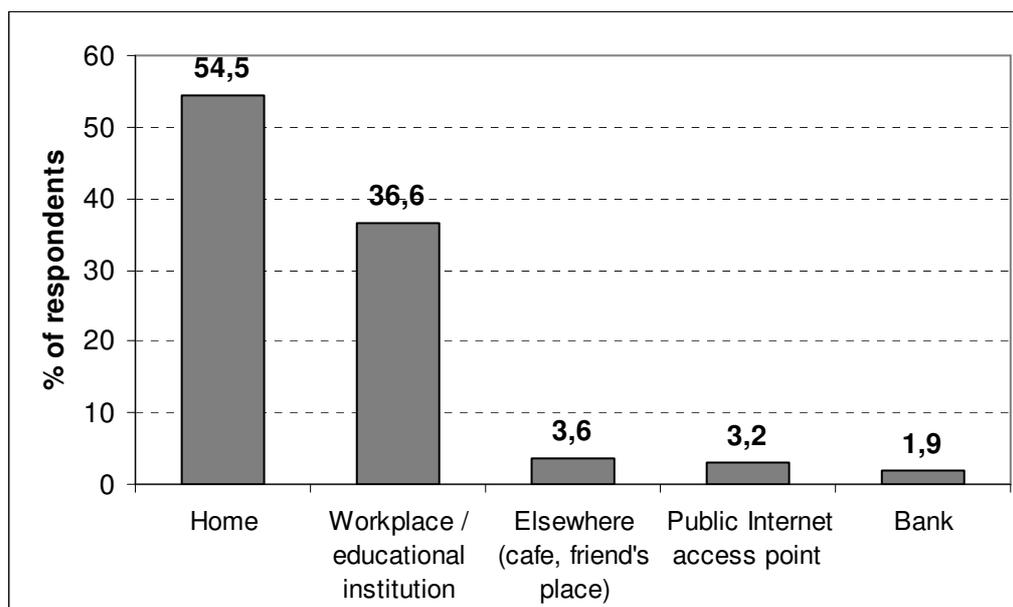


Table 28 shows from which IP-addresses the largest number of e-votes came. These were Ühispank offices, Citizenship and Migration Board and Tallinn City Government, and also the offices of Elion, EMT and Hansapank. The voters at workplace and the users of public voting places are not brought out separately. A number of state agencies and large enterprise Eesti Energia follow, i.e. the places where the workers have the possibility to use computers with Internet access and ID card reader.

Table 28 Places Where More than 20 E-Votes Were Cast:

Source: National Electoral Committee

No. of votes	Voting place	No. of votes	Voting place
210	Ühispank offices	44	Ministry of Economic Affairs and Communications
165	Citizenship and Migration Board	43	Eesti Energia
80	Tallinn City Government	32	Tartu City Government
70	Riigikogu	28	Clients of AS Kernel (radio links) www.kodu.ee
61	different state agencies	27	Ministry of Finance

58	Ministry of Justice	26	Transservice-N http://www.narvatransiit.ee/
58	Tax and Customs Board	26	Social Insurance Board
58	Elion	25	Ministry of Foreign Affairs
55	Police Board	24	AS If Kinnisvarahaldus
54	EMT	23	State Audit Office
50	Hansapank	22	University of Tartu
49	State Chancellery	21	Clients of Elisa

When we look at voter turnout by days (see Table 29), we can see that number of voters was the greatest on the first day of voting. The periods of the most active voting were at 9 a.m. and at 7 p.m. (see Table 30). During the whole e-voting period, the number of e-voters was the largest at the beginning of the voting period and even larger during the last hour of e-voting (see Table 31).

Table 29 E-Voting Activity By Days
Source: National Electoral Committee

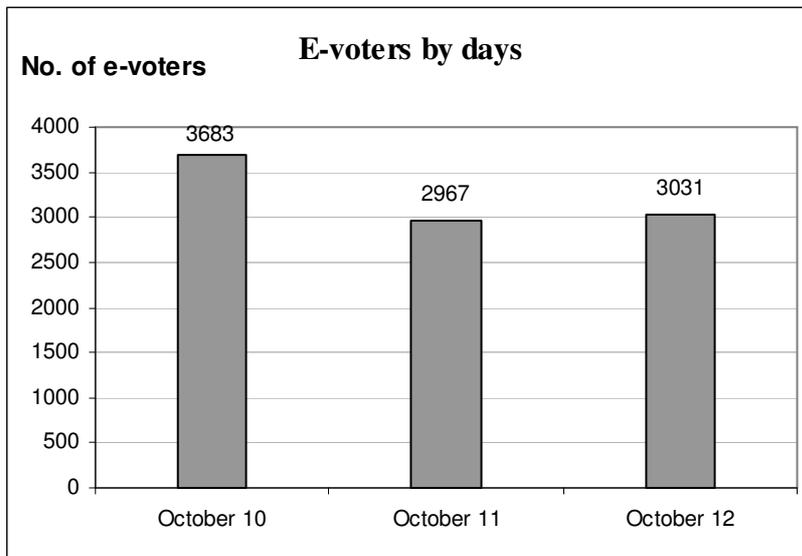


Table 30 E-Voting Activity By Hours

Source: National Electoral Committee

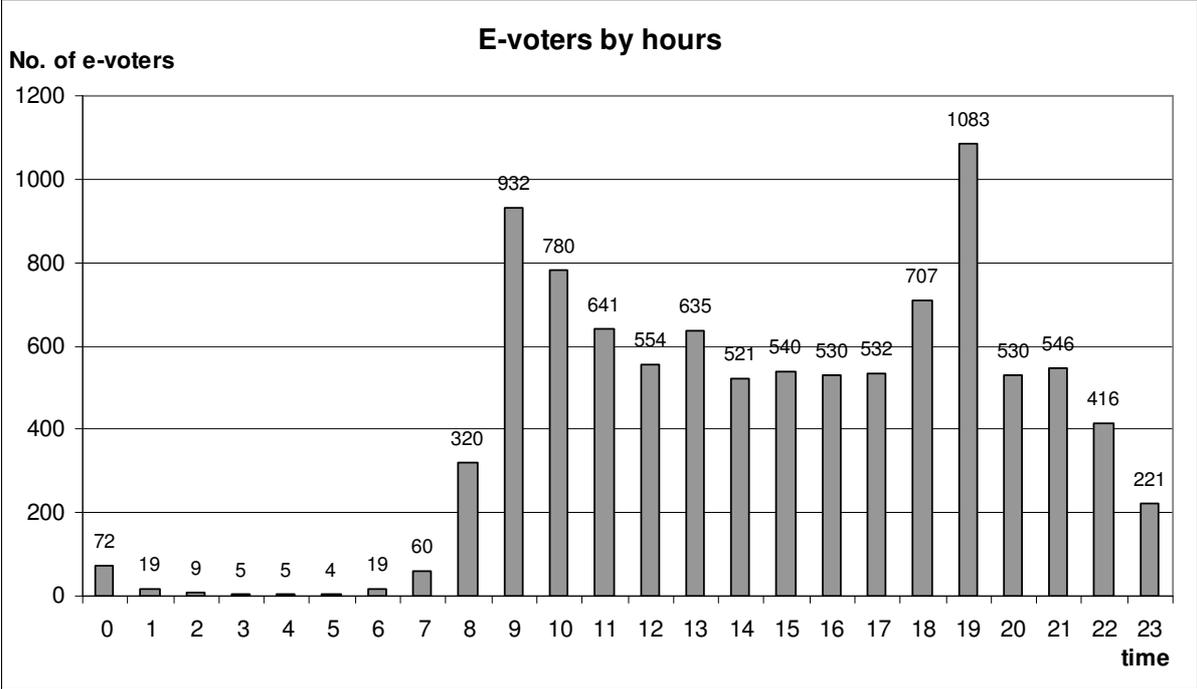
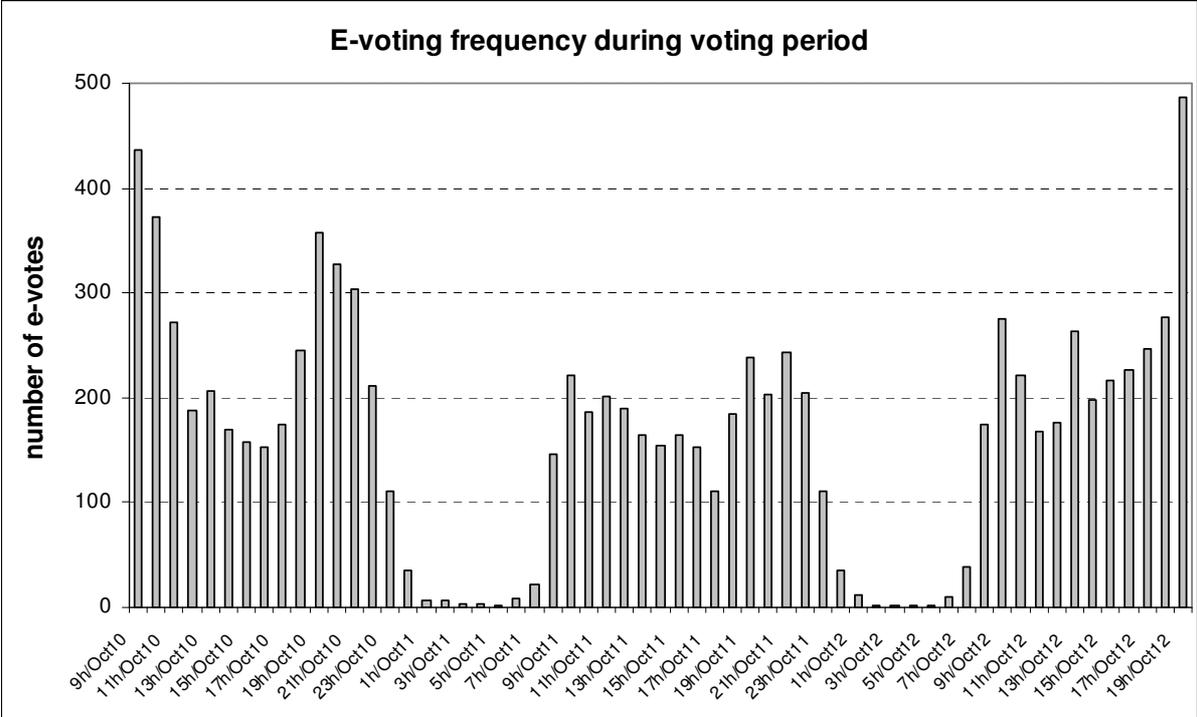


Table 31 E-Voting Frequency During Voting Period

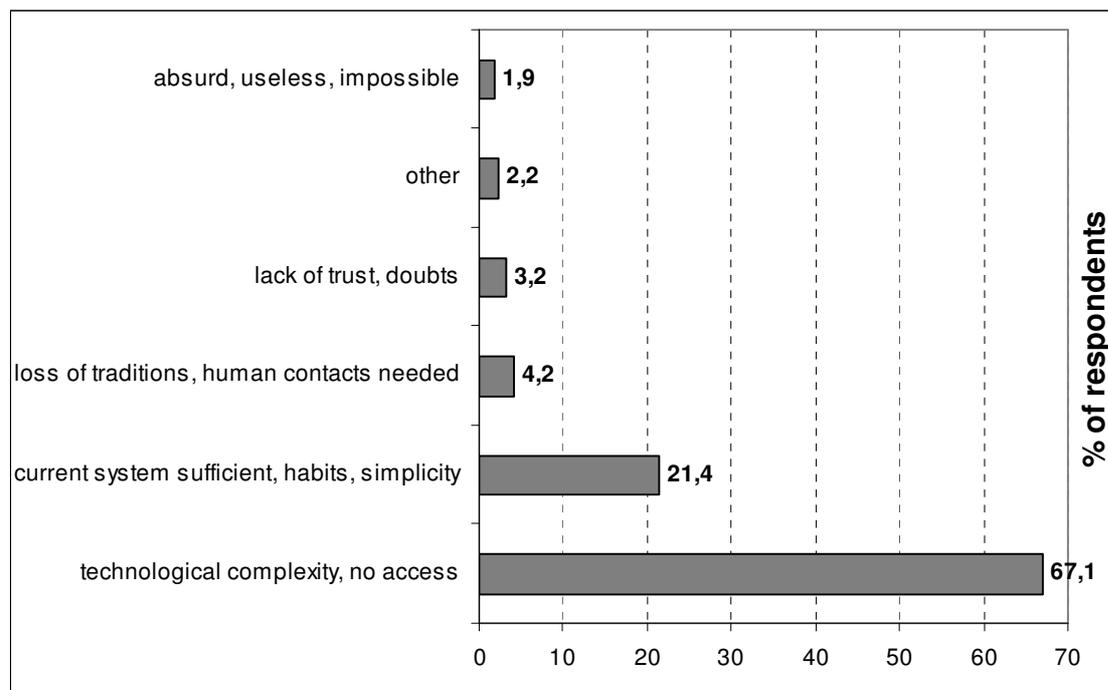
Source: National Electoral Committee



voting – Russian speaking voters did not participate at the level as the other voters. However, the general attitude towards e-voting was positive. Voters who did not use e-voting were mostly afraid of technical complexity or they did not have access to Internet. The amount of people who did not trust the whole system or considered it useless was not significant (Table 32).

Table 32 Subjective reasons for not using e-voting

Source: CoE+eGA



4.3. Influence of E-Voting on Election Results

4.3.1. Change of Voter Turnout

Estonian e-voting experience in 2005 reassures the hypothesis that e-voting does not raise the voting activity of people who never take part in elections, but it encourages the participation of voters who vote sometimes. Thus, e-voting slows down the trend of falling participation.

Table 33. Frequency of usual political participation and mode of vote in 2005

Source: CoE+eGA

Vote in 2005	Frequency of usual political participation				
	in all elections	in some elections	from time to time	never	total
At the polling place	77,6%	18,0%	3,5%	0,9%	100%
By Internet	70,2%	24,4%	4,8%	0,6%	100%
Total					100%
No. of respondents	(467)	(234)	(26)	(5)	(632)

In specialist literature, increasing of voter turnout is regarded as the main purpose of the implementation of e-voting. In Estonia increasing voter turnout has not been so clearly set as

objective. It is clear that at the local government councils elections the voter turnout increased at least by the votes given abroad: voting by mail from abroad is not possible at the local government councils elections. The introduction of e-voting serves the goal to bring people to vote by enlarging the accessibility.

4.3.2. Comparison of E-Voting Results of Political Parties with the General Voting Results

The largest number of votes were given to the Reform Party who was the initiator of the e-voting project and promoted e-voting during the whole e-voting project. Among other things the Reform Party organised ID card user training and handed out ID card readers during their election campaign. The Centre Party who on the background of their general success could have received many e-votes ranked 5th among the political parties by the number of e-votes. The reason for such result may among other things be the opposition towards e-voting among their supporters.

Table 34 Division of E-Votes by Political Parties in Comparison with the Total Results

Source: National Electoral Committee

Party	e-votes	%	total number of votes	%	percentage of e- votes in all votes ¹⁴
Estonian Reform Party	3039	32,7	83 953	16,9	3,61
Isamaaliit	1629	17,5	42 566	8,6	3,82
Res Publica	965	10,4	42 004	8,5	2,29
Social Democratic Party	916	9,9	31 921	6,4	2,86
Estonian Centre Party	806	8,7	126 449	25,5	0,63
Estonian People's Union	640	6,9	61 871	12,5	1,03
Estonian Christian People's Party	24	0,3	1799	0,4	1,33
United People's Party of Estonia	12	0,1	3407	0,7	0,02
Estonian Independence Party	8	0,1	687	0,1	1,16
Estonian Left Party	6	0,1	317	0,1	1,89
Russian Party in Estonia	0	0,0	406	0,1	0,00
Total number of e-votes	9287	100,0	496 336	100,0	

The research ordered by the Council of Europe studied the impact of political variables on choosing e-voting over the voting in polling place. On the political left-right scale voters in right side tend to be more likely to vote by Internet. The real decision whether to vote electronically or by paper ballot is influenced by other factors and considering all other factors in general the political variables lose their importance and apparently e-voting is politically neutral.

According to research important factors in choosing e-voting over voting in polling place are voters' age, language, computing knowledge and trust in e-voting procedures. The non-decisive factors are gender, living place, education, income, trust in parliament and government, trust in politicians, frequency of Internet use and its accessibility and trust in transactions over the Internet.

¹⁴ Percentage of e-votes given to a political party among all votes given to a political party

4.4. Influence of E-Voting on the Legitimacy of Election Results

In the media the fact that elderly people e-voted by themselves has been put under dispute. However there is no evidence to prove this statement. It should be mentioned that according to law it is allowed to assist voters if he or she is unable to complete the ballot himself or herself.

In single cases voters who have e-voted during advance voting period were allowed to vote additionally in election day. Originally the election law legislated that e-voter may change his or her e-vote also in election day but this principle was changed closely before elections. However, polling station committees reported the cases named above and the National Electoral Committee cancelled the e-votes and consequently the principle that every voter has one vote was followed.

No failures were found in the technical system of e-voting. No cases of buying e-votes have become public and no legal proceedings were initiated. The legitimacy of election results has not been contested by referring to e-voting.

Good Practice of E-Voting

Acknowledging Estonia's progress in the use of information technology in different spheres of life and people's readiness to use new means of communication;

keeping in mind the importance of the legalisation of e-voting by increasing the citizens' freedom of choice in choosing the way of voting;

declaring that e-voting does not mean giving up traditional ways of voting;

aware of the responsibility of all of us for the lawful and successful running of e-voting;

we adopt both in word and deed the following Principles of Honest E-Voting:

1. the procedure of e-voting, and also the fact that guaranteeing privacy during the act of voting is a requirement proceeding from the Constitution, is explained to electors neutrally and impartially; people are informed of the dangers that accompany the transfer of ID card and its codes to other persons;

2. no collective e-voting events (opening of e-voting offices or service desks etc.) are organised on e-voting days, and such events are considered violations of the freedom of voting;

3. people are not urged to vote on e-voting days by offering a computer for that purpose or influencing the electors in any other way with the aim of collecting their votes;

4. electronic advertising containing the hyperlink <https://www.valimised.ee> to the e-voting web page is avoided in order to prevent the danger of entering a false web page that might have been set up for collecting people's personal data;

5. no election campaigning is carried out at public Internet access points with e-voting possibility;

6. when and if possible, take actively part in observing the procedure of e-voting, recording the results of observation honestly and impartially and informing the National Electoral Committee and general public of them;

7. during the election campaign and after the elections, if the lawful procedures of e-voting are observed, e-voting and thus the legality of the whole election is not questioned for political reasons.

Good E-Voting Practice has been prepared on the initiative of e-Government Academy in cooperation with the representatives of political parties and the public.

Decision of the Supreme Court of Estonia of Electronic Voting

(see <http://www.nc.ee/klr/lahendid/tekst/RK/3-4-1-13-05.html>)

In the Decision of the Supreme Court, the positions of the parties of the dispute are reviewed as follows.

The President of the Republic is of the opinion that the amendment to the Local Government Council Election Act, establishing the right of a voter to change his or her vote given by electronic means for unlimited number of times during the time allocated for advance polls, is in conflict with the principle of uniformity of local government council elections, established in § 156(1) of the Constitution, which requires that each person with the right to vote has one vote and that all persons have been given the possibility to vote in similar manner. The principle of uniformity means that a voter can vote but once, that his or her vote is taken into account but once when counting votes, and that the vote does not become distorted in the course of voting. Through the possibility to change the vote given for unlimited number of times the contested Act accords advantages to voters voting by electronic means in comparison to the voters using other voting channels, as the latter lack the possibility to vote again or vote differently.

The justification that the possibility to change the vote given by electronic means for unlimited number of times helps to prevent purchasing of votes when voting via the uncontrolled medium of Internet and guarantees the freedom of voting, is not appropriate. The possibility to change, during advance polls, for unlimited number of times the vote given by electronic means, established for the protection of the freedom to vote and secrecy of voting, must not infringe upon other electoral principles protected by the Constitution.

The Constitutional Committee of the Riigikogu pointed out that the possibility to change electronic votes serves the aim of guaranteeing the freedom to vote and of guaranteeing the uniformity of voting through preventing the purchasing of votes.

The principle of uniformity means that all voters have equal possibilities to affect the voting results, i.e. an equal number of votes will be taken into account per voter. The principles of uniformity and generality in their conjunction require that the participation in voting, guaranteed to voters, be as convenient as possible. New voting channels serve the aim of increasing the participation in voting and thus protecting the representative nature of representative bodies.

The principle of uniformity does not mean that all votes should vote using exactly the same channel. All those who use different channels of voting are, in fact, in a somewhat different situation, and so far this has not been deemed to be in conflict with the principles of democratic elections. From the point of view of democracy it is important that only one vote per voter be taken into account. In regard to voting by electronic means the taking into account of one vote per voter shall be guaranteed by the same methods, which are used when counting the votes given outside the polling divisions of one's residence.

Proceeding from the principle of uniformity the state shall take measures to prevent the purchasing of votes, otherwise it would be possible to obtain more than one vote either in consideration for benefits or under the influence of a threat. Purchasing of an electronic vote becomes less reasonable only when an electronic vote can be changed by another electronic vote or by a ballot paper.

The Chancellor of Justice is of the opinion that the Act contested by the President of the Republic is constitutional.

Proceeding from the principle of uniform elections the state shall enact regulations enabling all voters to vote in equal manner. By the contested Act the state has guaranteed all voters a legal possibility to vote in similar manner, including the right to vote by electronic means and to change the vote given by electronic means. According to the valid law it is possible to change a vote given by a ballot paper outside the polling division of one's residence during advance polls. The principle of uniformity can not be interpreted as a requirement that all voters must in fact vote in a similar manner. Uniformity means, first and foremost, the requirement that all voters have equal possibilities to influence the voting result.

If uniformity were interpreted as the prohibition to change one's vote during voting, the restriction of the principle of uniformity would be justified with the principles of freedom to vote and secret voting. The possibility to change the vote given by electronic means renders the influencing of the will of a voter by illegal means useless and pointless, and is thus an additional guarantee, supplementing the measures of penal law, for guaranteeing the principle of free voting when voting by electronic means. To those persons who did not vote secretly the possibility to change one's vote gives an essential remedy for restoring the secrecy of voting.

Bearing in mind the values underlying different electoral principles and the weight thereof, the apparent infringement of the principle of uniformity is justified by the need to protect the principles of freedom to vote and secrecy of voting.

The Minister of Justice also did not concur with the position of the President of the Republic and was of the opinion that the contested Act was not unconstitutional.

The principle of uniformity means that all voters have an equal number of votes and that the votes of voters of different electoral districts have more or less the same weight. The principle of uniformity does not require absolute equalisation of voting conditions and procedures. Estonian electoral law recognises different methods of voting, which are all deemed to be in conformity with the principle of uniformity. Uniformity is meant to protect a voter against unequal treatment upon considering the influence of his or her vote on voting results. The possibility to change one's vote does not increase the influence of the vote in comparison to the vote of a person voting through any other channel. At local government council elections there is the possibility to change one's vote both upon voting by electronic means as well as upon voting by a ballot paper at a polling division.

Even if we considered the possibility to change votes as a restriction to the principle of uniformity, the restriction still serves a reasonable aim and is a proportional one. The aim of the contested Act is to sufficiently guarantee the secrecy of voting, and through this, the freedom to vote. When there is a possibility to change one's vote, the influencing of voters in an uncontrolled voting medium becomes pointless. In the present case the highest possible degree of equal treatment of voters using different voting channels is guaranteed, a degree that can be considered compatible with the requirements to voting via uncontrolled medium, proceeding from the principle of freedom of voting.

The National Electoral Committee points out that the preclusion of several votes by one voter, i.e. the uniformity in the context of voting by electronic means, is guaranteed by a system similar to the system of two envelopes, employed upon voting outside the polling division of one's residence at advance polls. Upon voting by electronic means a voter makes his or her choice, which shall be encoded. At the end of the voting procedure the voter shall approve the choice by his or her digital signature, which means that personal data is added to the encoded vote. The personal data and the encoded vote shall be stored together until the counting of

votes on the election day, with the aim of ascertaining that the person has given only one vote. The personal data of a voter and the e-vote given by the voter shall be separated before the counting of votes, after the fact that the voter has given only one vote has been checked. As it is not possible to transfer the votes together with personal data into the computer counting the votes, the secrecy of voting is also guaranteed.

The system of electronic voting is completed, it has undergone repeated laboratory trials and was publicly tested during a poll of inhabitants of Tallinn in January 2005.

The Supreme Court justified the confirming of e-voting to the Constitution of Estonia with the following:

The principle of uniformity of local government council elections is established in the second sentence of § 156(1) of the Constitution, pursuant to which the elections of a local government council shall be general, uniform and direct. The principle of uniform elections, being one of the pillars of democratic statehood, means that all voters must have equal possibilities to influence the voting results. In the context of active right to vote the principle of uniformity primarily means that all persons with the right to vote must have equal number of votes and that all votes must have equal weight upon deciding the division of seats in a representative body.

Pursuant to Recommendation Rec(2004)11 of the Council of Europe of 30 September 2004 to member states on legal, operational and technical standards of e-voting (hereinafter 'Standards of e-voting') the principle of uniform suffrage in the context of e-voting means four requirements. Firstly, it should be guaranteed that a voter shall be prevented from inserting more than one ballot into the electronic ballot box, and that a voter shall be authorised to vote only if it has been established that his/her ballot has not yet been inserted into the ballot box (§ 5). Secondly, the e-voting system shall prevent any voter from casting a final vote by more than one voting channel (§ 6). Thirdly, every vote deposited in an electronic ballot box shall be counted, and each vote cast in the election or referendum shall be counted only once (§ 7). Fourthly, where electronic and non-electronic voting channels are used at the same time, there shall be a secure and reliable method to aggregate all votes and to calculate the correct result (§ 8). All the requirements are aimed at guaranteeing that only one vote per voter is taken into account upon electronic voting. Although the Recommendation of the Council of Europe is not a legally binding document, it summarises the understanding of the democratic states of Europe of the conformity of electronic voting with the election principles inherent to democratic states, and it is thus an appropriate tool for interpreting the Constitution.

Pursuant to § 1(2) of the Local Government Council Election Act each voter shall have one vote. Pursuant to § 17 of the Contested Act the LGCEA shall be supplemented with § 53¹, subsection (1) of which establishes that when a voter has given several votes electronically, the last vote shall be taken into account. Pursuant to subsection (4) of the same section, if a voter has voted both electronically and by a ballot paper, the ballot paper shall be taken into account (the principle of supremacy of ordinary voting).

Within the system of electronic voting the taking into account of only one vote per voter is guaranteed by a system similar to the so called system of two envelopes, used upon voting outside the polling division of one's residence during advance polls. Upon voting by

electronic means a voter makes his or her choice, which shall be encoded (placed in a so-called inner envelope). Thereafter the voter shall approve the choice by his or her digital signature, which means that personal data is added to the encoded vote (so-called outer envelope). The personal data and the encoded vote shall be stored together until the counting of votes on the election day, with the aim of ascertaining that the person has given only one vote. The personal data of a voter and the vote given by the voter shall be separated after the fact that the voter has given only one vote has been checked and repeated votes have been eliminated. It is possible to open the so-called inner envelope only after the personal data added to encoded vote have been separated with the help of a key given only to the members of the National Electoral Committee, after the polling divisions have been closed. Thus, the system of electronic voting guarantees that only one vote per voter shall be taken into account, ensuring, at the same time, that the voting remains secret.

Upon weighing the effect of the possibility to change an electronic vote on the weight of the vote given by a voter, the Chamber points out that in the case of repeated voting the votes given earlier shall be annulled. Despite the repeated electronic voting a voter has no possibility to affect the voting results to a greater degree than those voters who use other voting methods. A vote given by electronic means shall be counted as one vote and from the point of view of voting results this vote is in no manner more influential than the votes given by voters using other voting channels.

Pursuant to the petition of the President the violation of uniformity of voting also consists in the fact that through the possibility to change the vote given for unlimited number of times advantages are accorded to voters voting by electronic means in comparison to the voters using other voting channels, as the latter lack the possibility to vote again or vote differently. This interpretation renders the principle of uniform elections a special case of general right to equality, established in § 12 of the Constitution.

Through legislation concerning suffrage the legislator has guaranteed all voters the legal possibility to vote in a similar manner. In the legal sense the system of electronic voting is equally accessible to all voters at local government council elections. Pursuant to § 5(1) and § 6(1) of Identity Documents Act, the identity card (ID card) necessary for electronic voting is mandatory both for an Estonian citizen staying permanently in Estonia and an alien staying permanently in Estonia on the basis of a valid residence permit. Thus, the state has created no legal obstacles to anyone to electronic voting, including to changing ones vote during the time prescribed for advance polls.

The Minister of Justice and the Chancellor of Justice refer to the possibility that the fact that due to factual inequality the possibility to change one's vote through electronic voting is not equally accessible to all voters can be regarded as an infringement of the general right to equality and the principle of uniformity. The Chamber also examines this allegation and points out that the existence of such infringement of the general right to equality and the principle of uniformity does not amount to an unconstitutional violation of the referred electoral principles. In order to answer the question of whether the possibility to change the vote given by electronic means amounts to an unconstitutional infringement of the right to equality and the principle of uniform voting, it shall be necessary to weigh whether the intensity of the infringement, consisting in the different treatment of the voters using electronic voting channels upon electing the local government councils, is proportionally related to the weight of the aims pursued.

The principle of equal treatment in the context of electing representative bodies does not mean that absolutely equal possibilities for performing the voting act in equal manner should be guaranteed to all persons with the right to vote. In fact, those who use the different voting methods provided by law (advance polls, voting outside the polling division of residence, voting in custodial institutions, home voting, voting in a foreign state, etc) are in different situations. For example, the voters who have to use the possibility of advance polls, are in a situation different from that of the voters who can exercise their right to vote on the election day. The guarantee of absolute actual equality of persons upon exercising the right to vote is infeasible in principle and not required by the Constitution.

The decision to allow electronic voting at the elections of local government councils was taken by the Riigikogu upon passing the Local Government Council Election Act on 27 March 2002, with the aim of increasing the participation in elections, that is the democratic participation of people in making decisions pertaining to communal life. Bearing in mind the principle that elections shall be general, the aim is a legitimate one. Pursuant to the principle that elections shall be general all persons with the right to vote must be guaranteed a possibility to participate in voting. The measures the state takes for guaranteeing the possibility to vote to as many voters as possible are justified and advisable.

Another aim of allowing electronic voting is the modernising of voting practices, that is the introduction of new technological solutions. The ever growing number of Internet users among Estonia's inhabitants and the spread of services offered through electronic means (see TNS EMOR monitoring survey of 2005 - <http://www.riso.ee/et/?q=node/136>), as well as the introduction of mandatory ID card, have created favourable conditions for the introduction of electronic voting. Also, the preamble of "Standards of e-voting", enumerating the aims of allowing e-voting, refers, inter alia, to facilitating the casting of the vote by the voter, increasing voter turnout by providing additional voting channels, bringing voting in line with new technologies and reducing, over time, the overall cost of conducting an election. Pursuant to this document the members states (of the Council of Europe) need to take account of the new information and communication technologies, which are increasingly being used in day-to-day life, also in their democratic practice. The Constitution does not prohibit the modernisation of electoral practices, and thus it is a legitimate justification of the infringement of the right to equality and principle of uniformity.

The introduction of electronic voting without allowing to change the vote given by electronic means may endanger the principles of free voting and secret voting. The principle of free elections is established in the first sentence of § 156(1) of the Constitution, pursuant to which a local government council is elected in free elections. The secrecy of voting as a sub-principle of freedom of elections is a prerequisite of free elections. Pursuant to the principle of free elections both the participation in elections as well as the choice to be made are voluntary. In addition to the obligation that the state refrain from interfering with the freedom of choice of persons, the principle gives also rise to the obligation of the state to guarantee the protection of voters against the persons who try to influence the voter's choices. Pursuant to this principle the state must create necessary conditions for conducting free voting and protect voters from such influences that prevent the voter to give or not to give his or her vote in the manner he or she wishes.

The most effective way to guarantee the freedom of the voters from any external influences is to allow voting only in polling divisions and in voting booths, where a voter enters alone. It is clear that in the case of electronic voting in an uncontrolled medium, that is via Internet

outside a polling division, it is more difficult for the state to guarantee that voting is free of external influence and secret.

In accordance with § 162 of Penal Code (violation of freedom of election or voting), preventing a person to freely exercise his or her right to elect or be elected at an election or to vote at a referendum, if such prevention involves violence, deceit or threat or takes advantage of a service, economic or other dependent relationship of the person with the offender is punishable by a pecuniary punishment or up to one year of imprisonment.

The voter's possibility to change the vote given by electronic means, during the advance polls, constitutes an essential supplementary guarantee to the observance of the principle of free elections and secret voting upon voting by electronic means. A voter who has been illegally influenced or watched in the course of electronic voting can restore his or her freedom of election and the secrecy of voting by voting again either electronically or by a ballot paper, after having been freed from the influences. In addition to the possibility of subsequently rectifying the vote given under influence, the possibility of voting again serves an important preventive function. When the law guarantees a voter, voting electronically, the possibility to change the vote given by electronic means, the motivation to influence him or her illegally decreases. There are no other equally effective measures, besides the possibility to change the vote given by electronic means, to guarantee the freedom of election and secrecy of voting upon electronic voting in an uncontrolled medium. The penal law sanctions do have their preventive meaning but subsequent punishment, unlike the possibility of changing one's electronic vote, does not help to eliminate a violation of the freedom of election and secrecy of voting.

The infringement of the right to equality and of uniformity, which the possibility of electronic voters to change their votes for unlimited number of times can be regarded as amounting to, is not sufficiently intensive to outweigh the aim of increasing the participation in elections and introducing new technological solutions. The Chamber is of the opinion that the possibility to change one's electronic vote is necessary for guaranteeing the freedom of elections and secrecy of voting upon electronic voting.

The Constitutional Review Chamber of the Supreme Court remarks that upon passing the contested regulation the legislator, having weighed different principles and the values underlying these, has appropriately balanced all electoral principles arising from the Constitution. Thus the e-voting provisions were considered constitutional and the President of the Republic proclaimed the Local Government Councils Election Act.