



Internet Voting in Estonia

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Elections in Estonia

- > General (Parliament), every 4 years;
- > Local government councils, every 4 years;
- > European Parliament, every 5 years;
- > Referendums, 1991, 1992, 2003

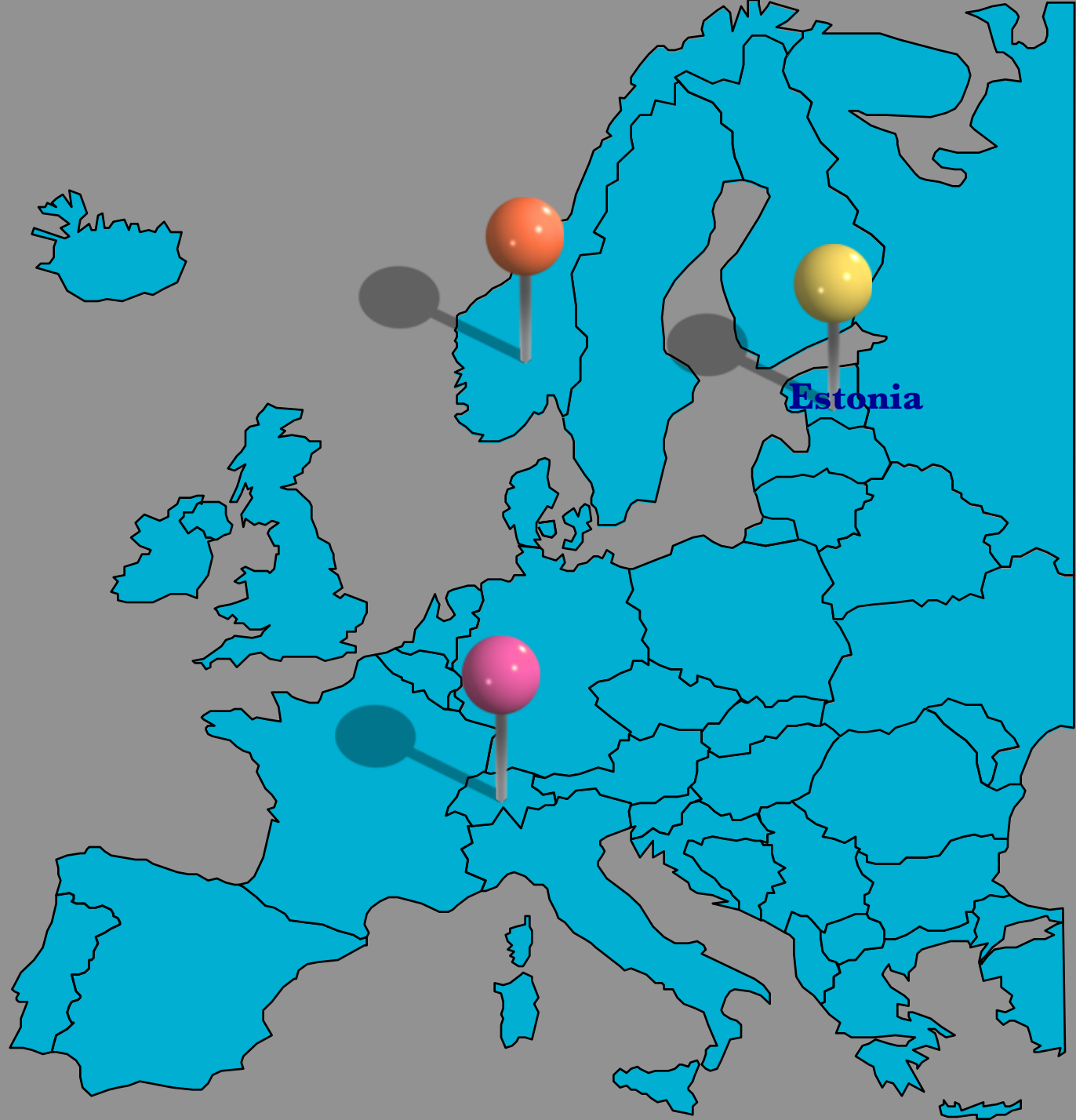
Voting in Estonia

Thu 10.	Fri 11.	Sat 12.	Sun 13.	Mon 14.	Tue 15.	Wed 16.	Thu 17.	Fri 18.	Sat 19.	Sun 20.10.2013
 Advance voting in county centres				 Advance voting in all polling stations						 Election Day Voting in all polling stations
 Internet Voting										

Election Administration in Estonia

ELECTORAL ADMINISTRATION IN ESTONIA





Estonia

Internet Voting?

- > In October 2005 Estonia had first-ever pan-national Internet Voting **with binding results**



- > Ever since, I-voting has been used in **five** elections in total (twice in local, twice in parliamentary and once in EP elections)

Estonian Internet Voting

Open
Receptive
Society

eGOV

Secure
Remote
eAuthenti-
cation

eID

Effective
Measures
to
Guarantee
Compliance
With
Electoral
Principles

eChange

TRUST

Reasoning behind Internet Voting

- > **To provide an additional and convenient channel for voting, thereby improving voting activity**
 - » to keep voters
 - » to bring younger people vote
- > **Creating the essential convenience in an information society and take advantage of the existing infrastructure – just another eID service**

Brief Pre-History

- > 2002
 - » Legal basis set in the law
- > 2003
 - » Project started: project manager and steering committee
 - » Initial concept developed
- > 2004
 - » Security Analysis on concept
 - » Refined concept
 - » Use-case model developed
 - » Public procurement: winner - Cybernetica
 - » Development of the 1st version
- > 2005
 - » Pilot project in Tallinn in January
 - » Elections in October – first legally binding I-voting!

ID-card Project

- › Started in 1997
- › First card issued: Jan 28, 2002
- › October 2006: **1 000 000th** ID-card was issued
 - › "rollout completed"

The card



Contains:

- Personal data file
- Certificate for authentication (along with e-mail forename.surname@eesti.ee)
- Certificate for digital signature

Compulsory document for all residents!

Mobile-ID

- > SIM-card with added eID functionality
 - » Authentication
 - » Digital signature
- > Certificates issued by the state
 - » Phone = card reader
 - » SIM = ID-card



Usage of the ID-card (m-ID)

- > Major ID-document
- > Replacement of
 - » member cards
 - » library cards
 - » health insurance card
 - » driver documents
 - » etc...
- > **Authentication token for all major e-services**
- > **Digital signature tool**

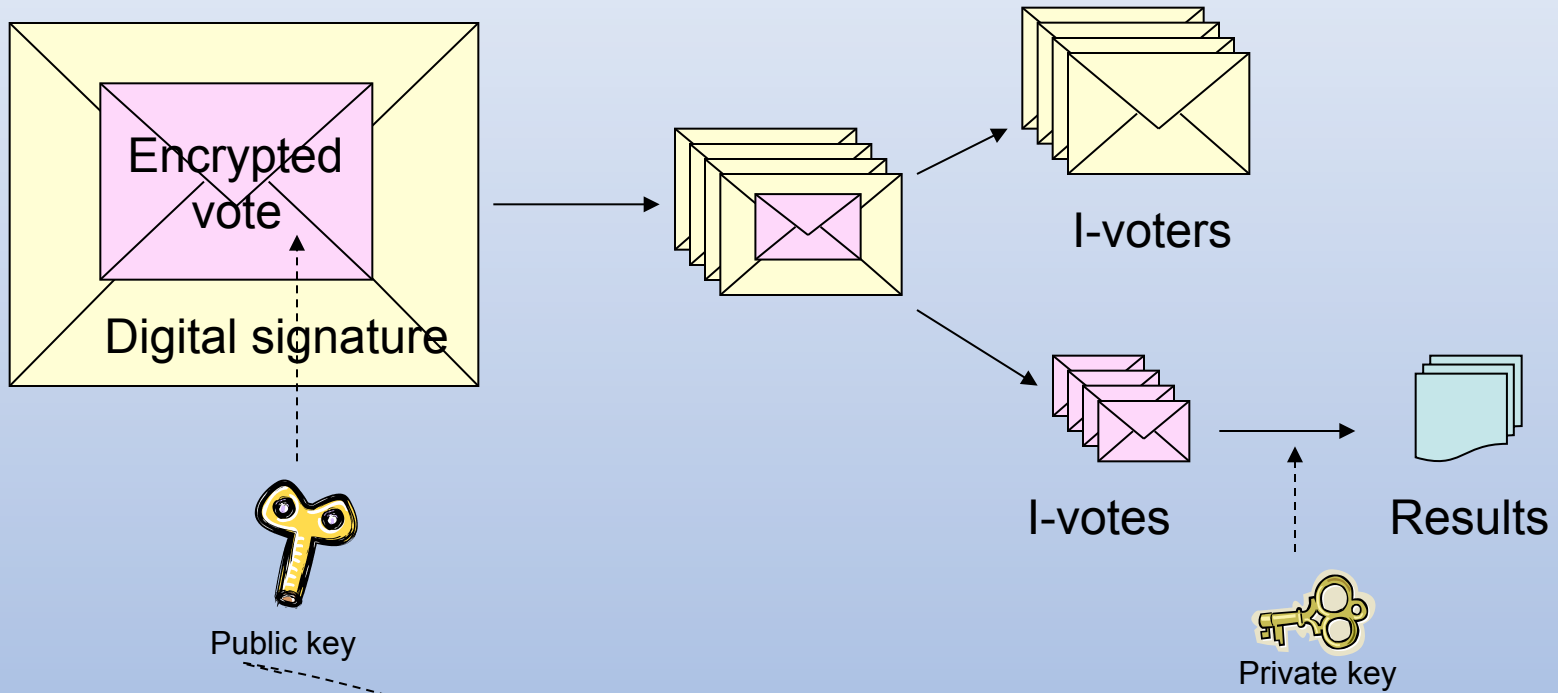
I-voting Main Principles

- > All major principles of paper-voting are followed
- > Voting from any computer connected to the Internet
- > Alternative to the paper-ballot
- > Digital voter register based on population register
- > Voter's identification with eID
- > Virtual double envelope scheme
- > Public-private key cryptography
- > “Virtual voting booth” (changing the I-vote and supremacy of the paper vote)

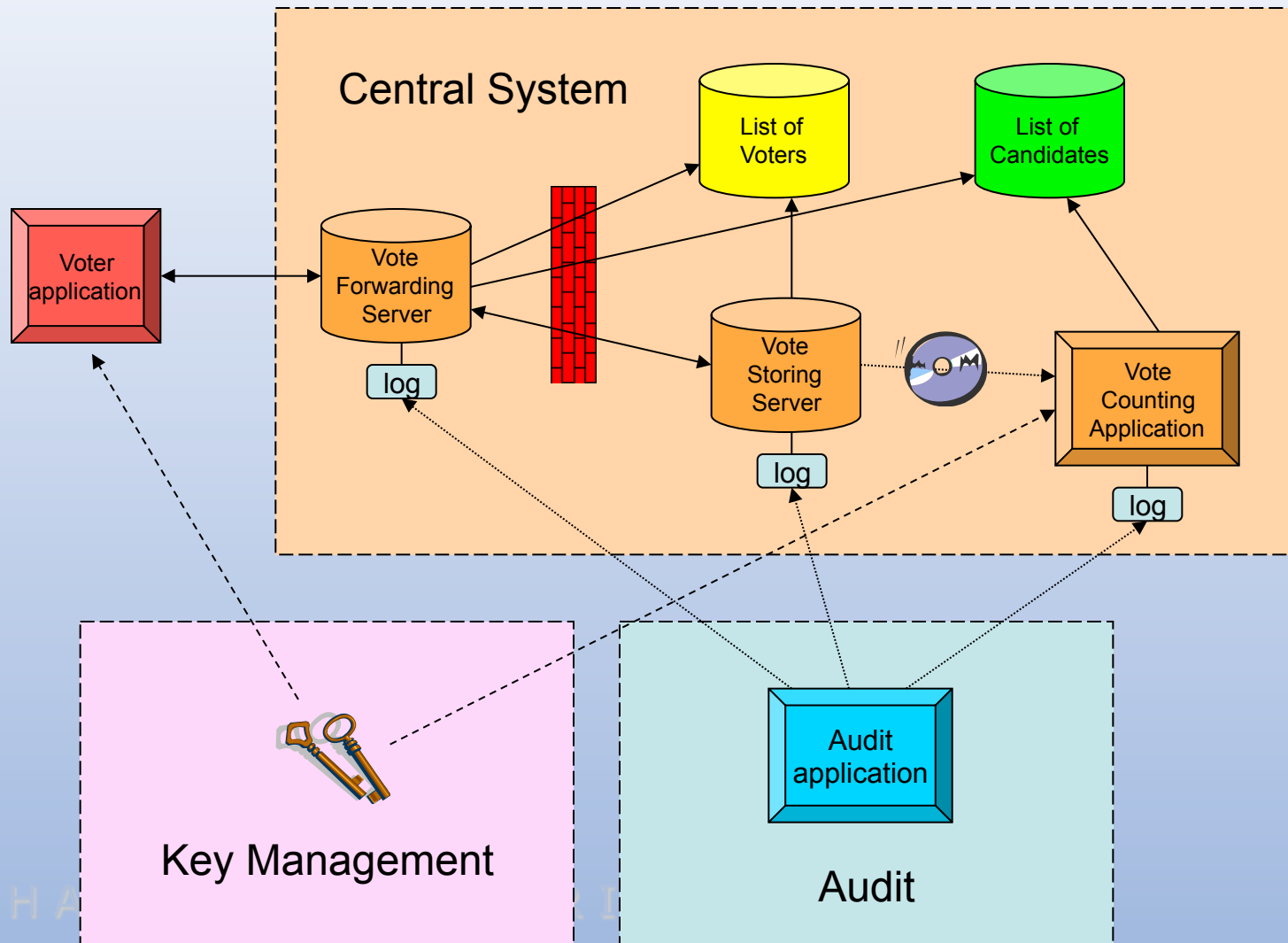
Voter registration

- > Missing
- > All citizen (residents) should register their place of living in central population register
- > Only voters with registered addresses are eligible
- > Population register is used

Envelope scheme



Architecture





Principle of Transparency

- > All system components shall be transparent for auditing purposes
- > No “black boxes” are allowed
 - » No use of 3rd party-controlled mechanisms or services

User view

Website for voting

www.valimised.ee

E-hääletamine on käimas!

Hääletamine algas 24. veebruaril kell 9.00 ja lõpeb 2. märtsil kell 20.00.

E-hääletamiseks tuleb alla laadida valijarakendus ning see installida arvuti peale.

- [Laadi alla valijarakendus Windowsi jaoks](#)

Tehniline abi e-hääletamisega seotud teemadel telefonil **1777** või e-posti aadressil abi@valimised.ee. Teave valimistega seotud küsimustes: info@wk.ee või www.wk.ee.

Otsid lisateavet valimiste kohta?

Run the Application

> Select your eID



In case of ID-card...

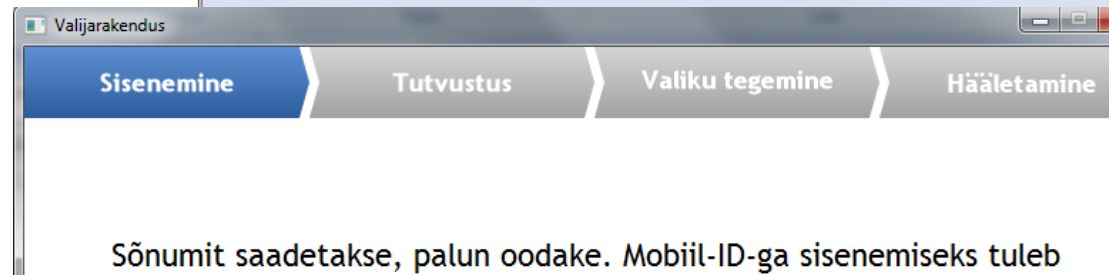
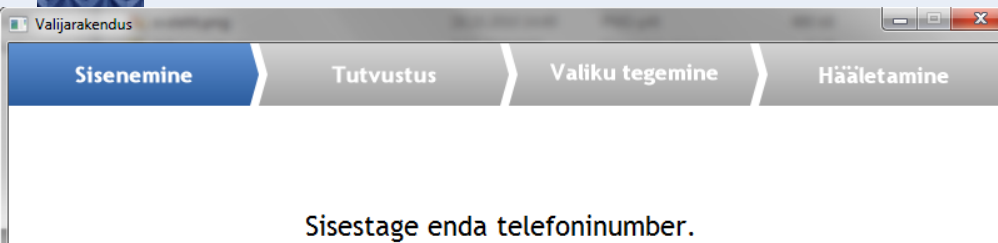
- Put your card into card reader
- Insert PIN 1



The screenshot shows a web application window titled "Valijarakendus" with a navigation bar containing "Sisenemine" and "Hääletamine". A modal dialog box titled "ID - kaart" is open, displaying a lock icon and the text "Sisesta PIN-kood isikutuvastuseks (PIN 1)". Below the text is a text input field containing "****". At the bottom of the dialog are "OK" and "Katkesta" buttons. Below the dialog, the main content area contains the text "Hääletamiseks peate ennast tuvastama ID-kaardi või Mobiil-ID abil:" and two buttons: "KAART" and "MOBIIL-".

In case of Mobile-ID...

- Enter phone number
- Verify verification code
- Insert PIN 1



Telefoninumber

Sõnumit saadetakse, palun oodake. Mobiil-ID-ga sisenemiseks tuleb Teil oma telefoni sisestada Mobiil-ID PIN1 kood pärast seda, kui olete saanud SMS-i sama kontrollkoodiga, mida näete siin:

7030



You are identified



The screenshot shows a web browser window titled "Valjarakendus". The navigation bar at the top has four steps: "Sisenemine" (highlighted in green), "Tutvustus" (highlighted in blue), "Valiku tegemine", and "Hääletamine". The main content area displays the following text:

TERE TULEMAST!

Nimi: **PEETER HÄÄLETAJA**
Isikukood: **37012021234**

Olete hääletamas 2011. aasta Riigikogu valimistel. Tegemist on ametlike valimistega, kus elektroonilist häält arvestatakse samamoodi kui pabersedeliga antud häält. Järgnevalt teete valiku ühe oma elukohajärgse valimisringkonna kandidaadi poolt.

At the bottom, there are two blue buttons: "Katkesta" on the left and "Otsustama" on the right.

Ballot completion

Choose a candidate

The screenshot shows a web application window titled "Valijarakendus" with four navigation tabs: "Sisenemine", "Tutvustus", "Valiku tegemine", and "Hääletamine". The "Valiku tegemine" tab is active. On the left, a scrollable list of candidates is shown, with "821: HELMI LOOPMANN" selected. The right side of the screen displays the selected candidate's name and the election district information.

Valijarakendus

Sisenemine Tutvustus **Valiku tegemine** Hääletamine

659: PAUL HIMMA
660: TÕNIS RÜÜTEL
661: AARE KITSING
662: IRINA STELMACH
663: ÜLO RUSSAK
664: TOIVO EENSALU
665: TIINA MÄGI
666: EBBA RÄÄTS
667: VANDA SOKOLOVA
668: LOIT RÕUK
669: PIRET SAAT

Eesti Pensionäride Erakond
821: HELMI LOOPMANN

Erakond Isamaaliit
924: TOIVO JÜRGENSON
925: TIINA VALLIKIVI
926: VENNO LAUL
927: OLEV REMSU
928: AILI KOGERMAN
929: ANNA-GRETA GUTMAN
930: VIIDO POLIKARPUS
931: EPP REBANE
932: ÜLO RUUBEL
933: RIINA ENKE
934: MARE RÄIS

Klõpsake soovitud kandidaadi nimele.

Kelle valite Riigikogusse?

Teie valimisringkond:
Tallinna Kesklinna, Lasnamäe ja Pirita linnaosa - Valimisringkond nr 2

Minu valik on:

kandidaat nr. 821
HELMI LOOPMANN
Eesti Pensionäride Erakond

Katkesta Valin

Confirmation (ID-card)

- Confirm your choice with PIN2

The screenshot shows a web application window titled "Valijarakendus" with a navigation bar containing three steps: "Vastus", "Valiku tegemine", and "Hääletamine". A modal dialog box titled "ID - kaart" is open, prompting the user to enter a PIN2 code for digital signing. The dialog contains a text input field with "*****" and two buttons: "OK" and "Katkesta".

Sisesta PIN-kood digiallkirjastamiseks (PIN 2)

OK Katkesta

huppu "Hääletan".
Hääle kinnitamisel küsitakse teie ID-kaardi PIN2 koodi digitaalseks allkirjastamiseks.

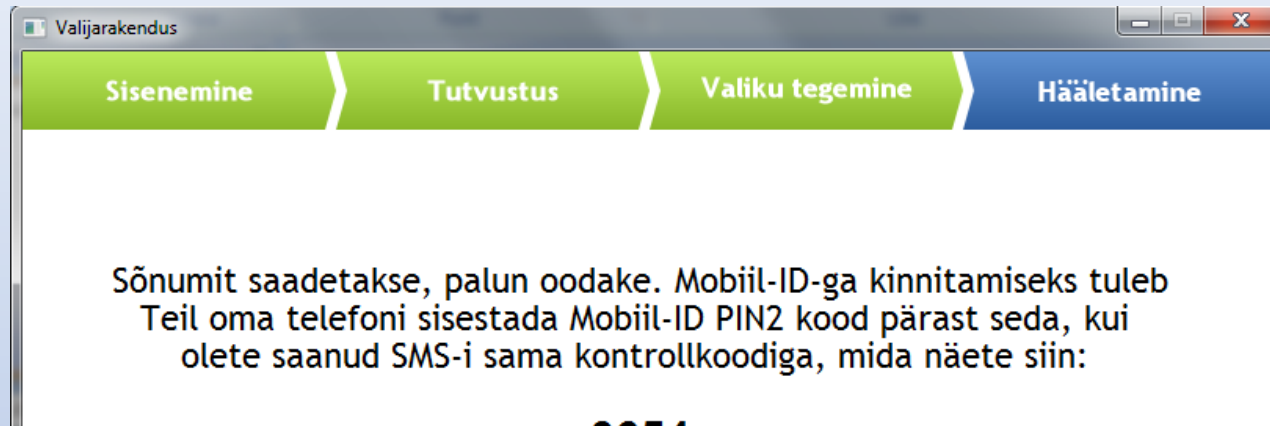
Kelle valite Riigikogusse?

Kandidaat nr. 821
HELMİ LOOPMANN
Eesti Pensionäride Erakond

Tagasi Hääletan

Confirmation (mobile-ID)

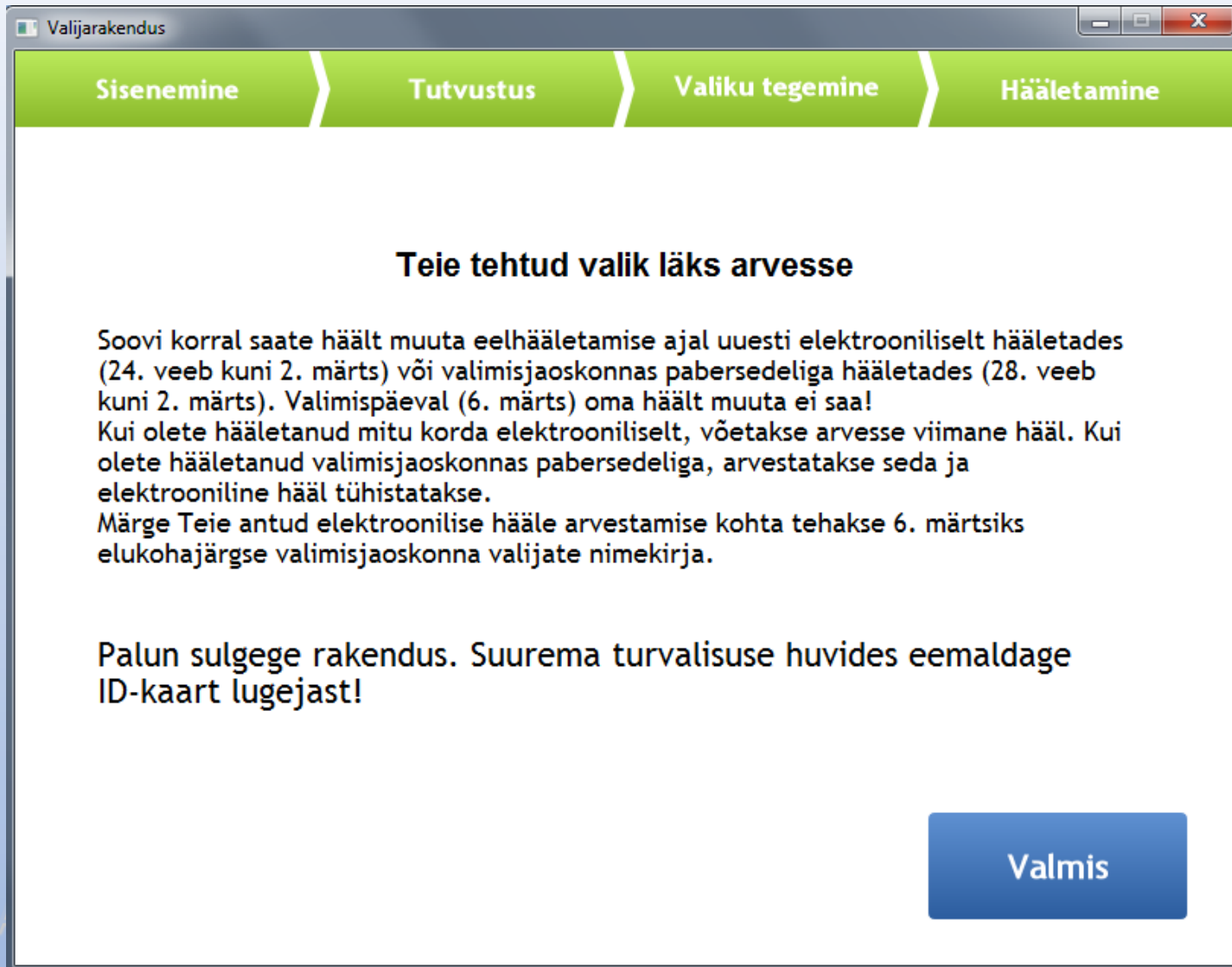
- Confirm your choice by signing digitally
- Verify verification code
- Insert PIN 2



3654



Vote received



The screenshot shows a web application window titled "Valijarakendus". The navigation bar at the top has four steps: "Sisenemine", "Tutvustus", "Valiku tegemine", and "Hääletamine". The main content area displays a confirmation message in Estonian, indicating that the user's vote has been received and will be counted. It provides instructions on how to change a vote before the election day (March 6th) and mentions that the final vote cast is the one from the electronic system. A blue "Valmis" button is located at the bottom right of the window.

Valijarakendus

Sisenemine Tutvustus Valiku tegemine Hääletamine

Teie tehtud valik läks arvesse

Soovi korral saate häält muuta eelhääletamise ajal uuesti elektrooniliselt hääletades (24. veeb kuni 2. märts) või valimisjaoskonnas pabersedeliga hääletades (28. veeb kuni 2. märts). Valimispäeval (6. märts) oma häält muuta ei saa!

Kui olete hääletanud mitu korda elektrooniliselt, võetakse arvesse viimane hääl. Kui olete hääletanud valimisjaoskonnas pabersedeliga, arvestatakse seda ja elektrooniline hääl tühistatakse.

Märge Teie antud elektroonilise hääle arvestamise kohta tehakse 6. märtsiks elukohajärgse valimisjaoskonna valijate nimekirja.

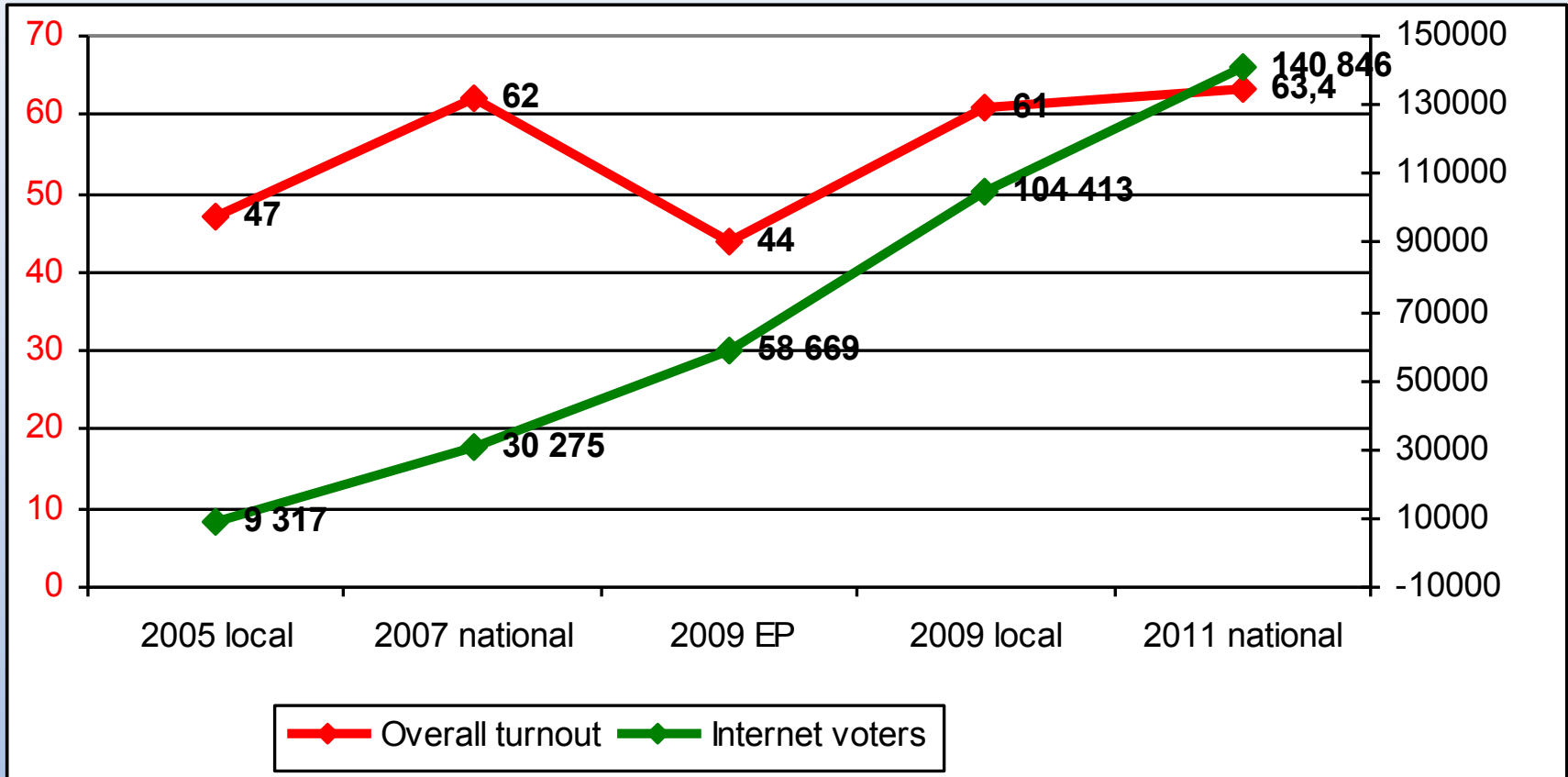
Palun sulgege rakendus. Suurema turvalisuse huvides eemaldage ID-kaart lugejast!

Valmis



Statistics & Sociological content

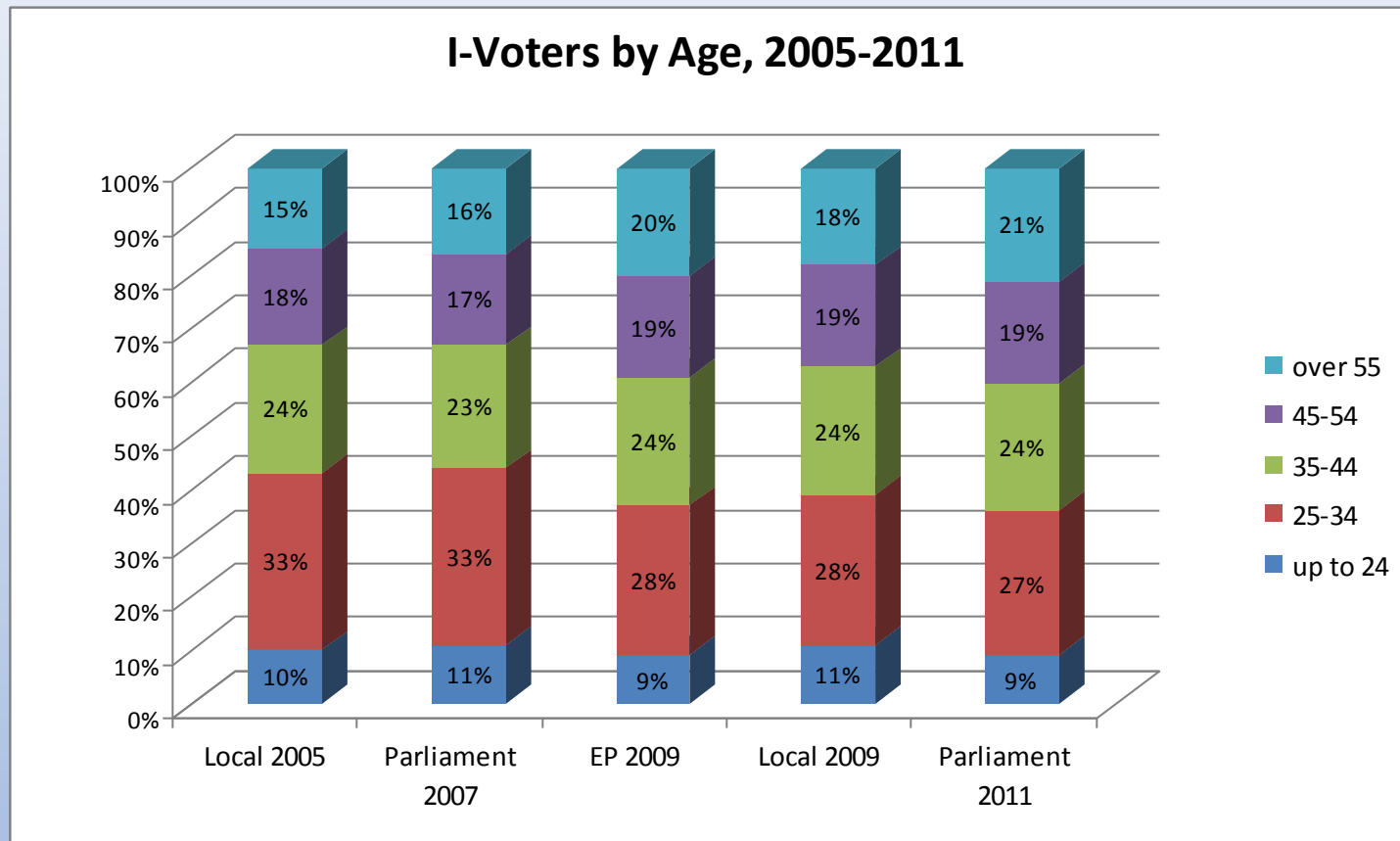
The spread of Internet Voting



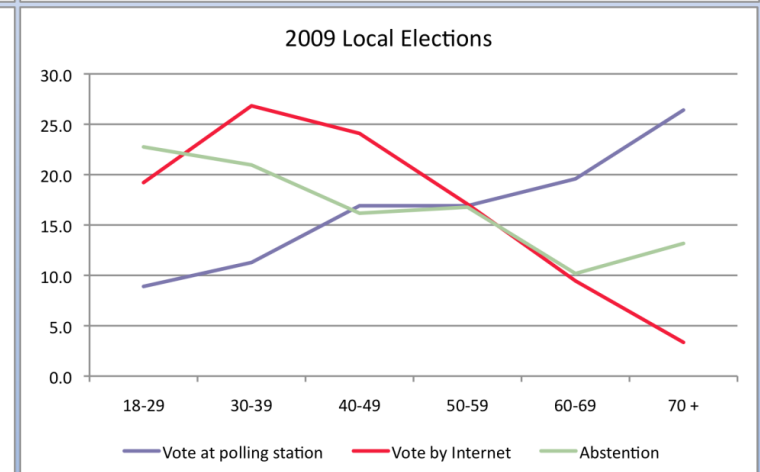
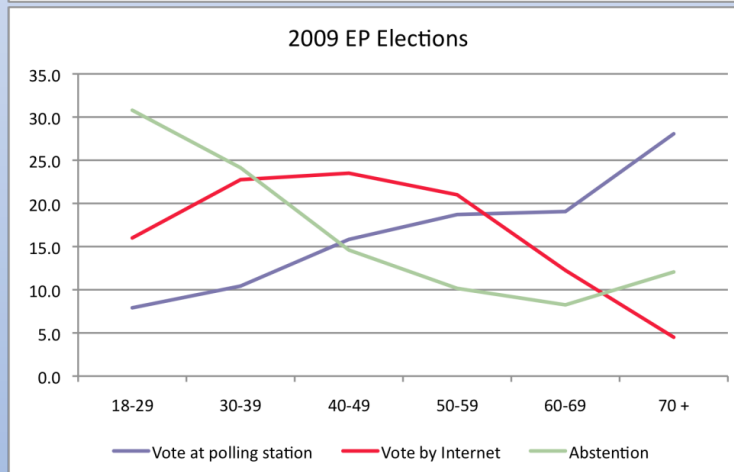
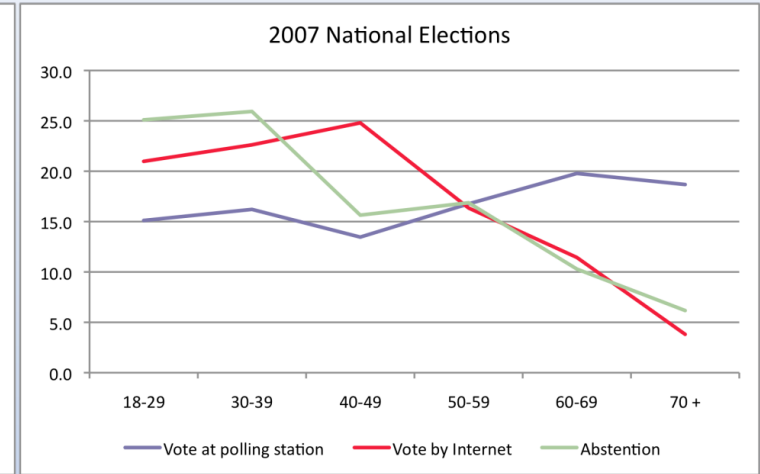
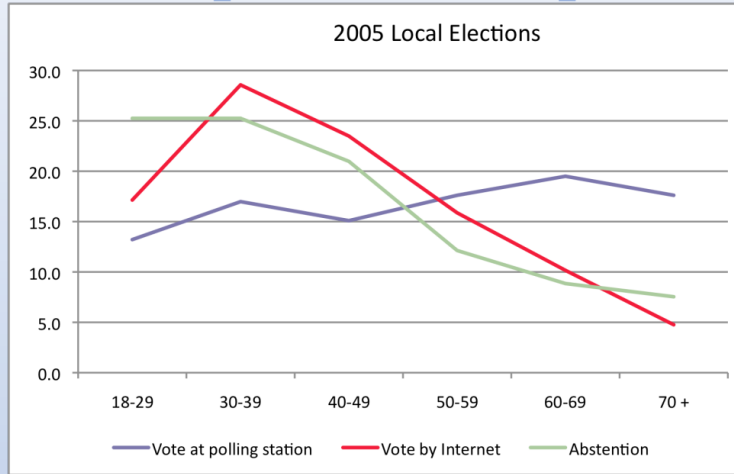
I-voting Statistics

	2005 LE	2007 PE	2009 EP	2009 LE	2011 PE
Number of I-votes	9 681	31 064	59 579	106 786	145 230
<i>Repeated i-votes</i>	364	789	910	2 373	4 384
Number of I-voters	9 317	30 275	58 669	104 413	140 846
<i>I-votes cancelled by paper ballot</i>	30	32	55	100	82
I-votes counted	9 287	30 243	58 614	104 313	140 764
% of i-votes among total <u>entitled to vote</u>	0,9%	3,4%	6,5%	9,5%	15,4%
% of i-votes among total <u>advance votes given</u>	7,2%	17,6%	45,4%	44%	56,4%

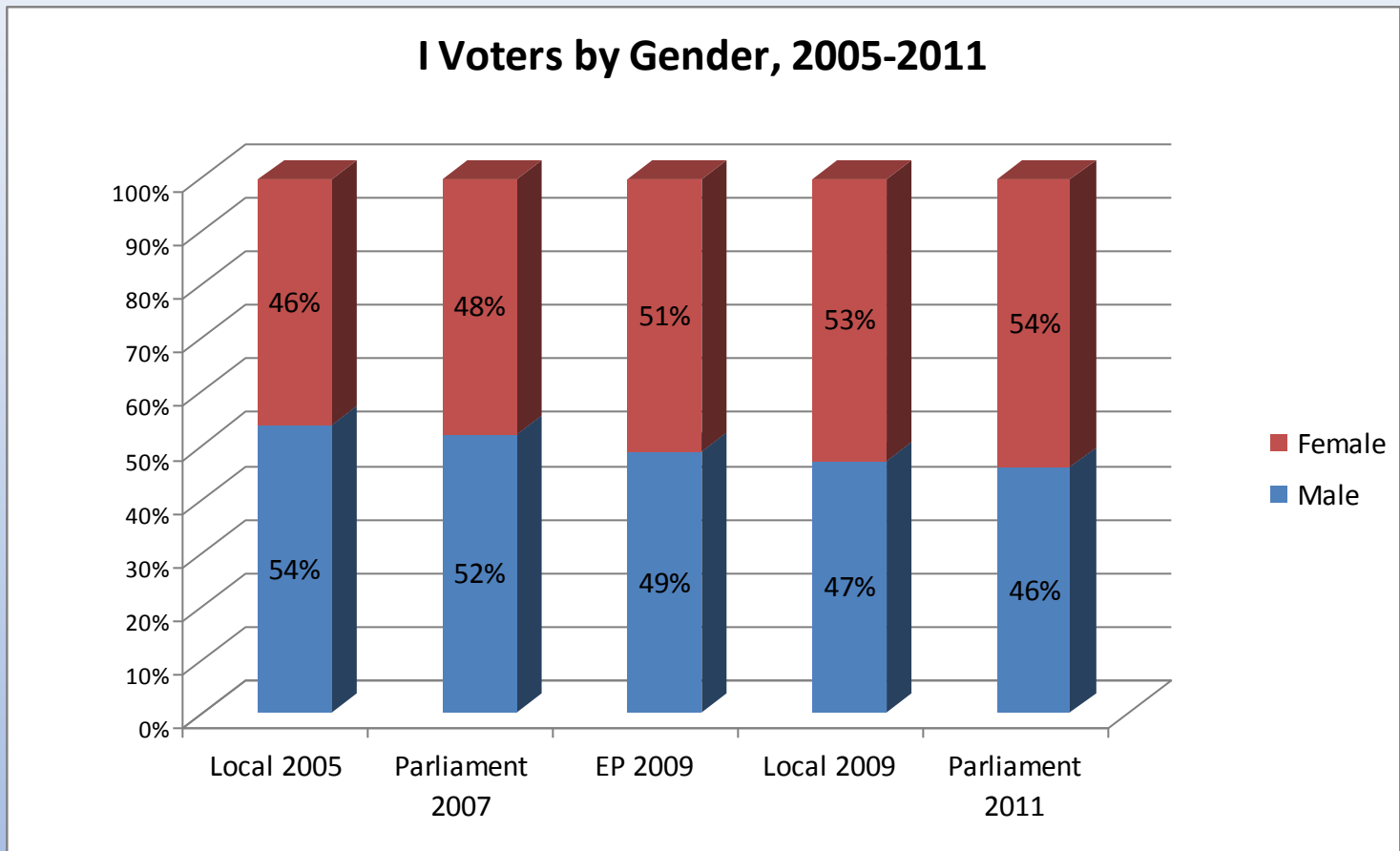
Is it for young people only?



Age and mode of participation



Is it for curious men?



Main issues after five elections

- > Various security questions- it is impossible to prove security, but only the opposite...
- > Verifying the Internet Vote→
- > Open/closed Voter App source code
- > Uniformity of elections
- > Role of “soft laws”
- > Is it possible to observe remote elections?



More information

www.valimised.ee

www.vvk.ee