A primer on voting systems

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Why proportional representation?

City of Toronto Archives, Series 1908, s1908_fl0559_it0002

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Voting systems considered in Canada

- Single Member Plurality (First past the post)
- Mixed member proportional
- Single Transferable Vote
- Alternative vote (preferential voting)
- P3

FPTP doesn't serve voters

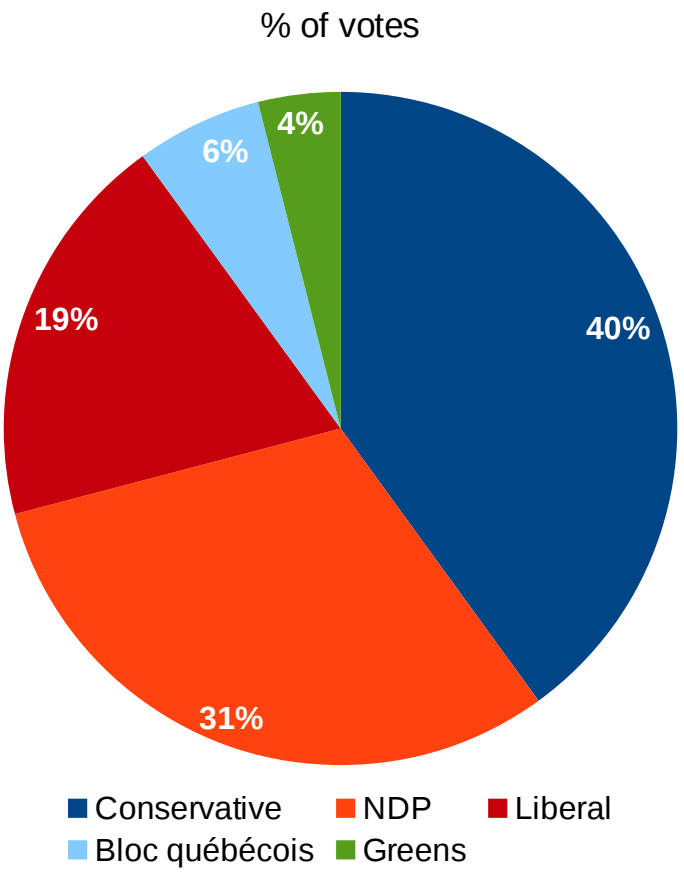
- Phony majorties
  - Ontario (since 1937)
  - Canada (since 1984)
  - Quebec (since 1985)
- Half the voters are unrepresented, while others are overrepresented
- How can institutions be accountable?

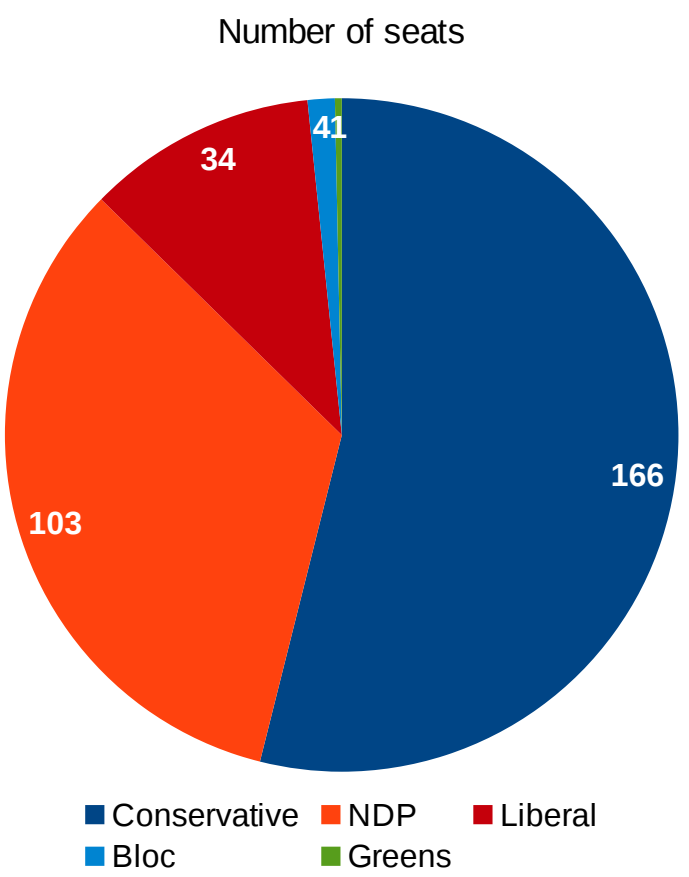
FPTP doesn't serve voters

- Under representation of women and ethnic minorities;
- Exageration of regional differences

Canadian federal election 2011		
Ontario	**% votes**	**% seats**
- Conservative	44	69
- Liberal	25	10
Quebec		
- NDP	43	79
- Bloc	23	5

Distortion of representation





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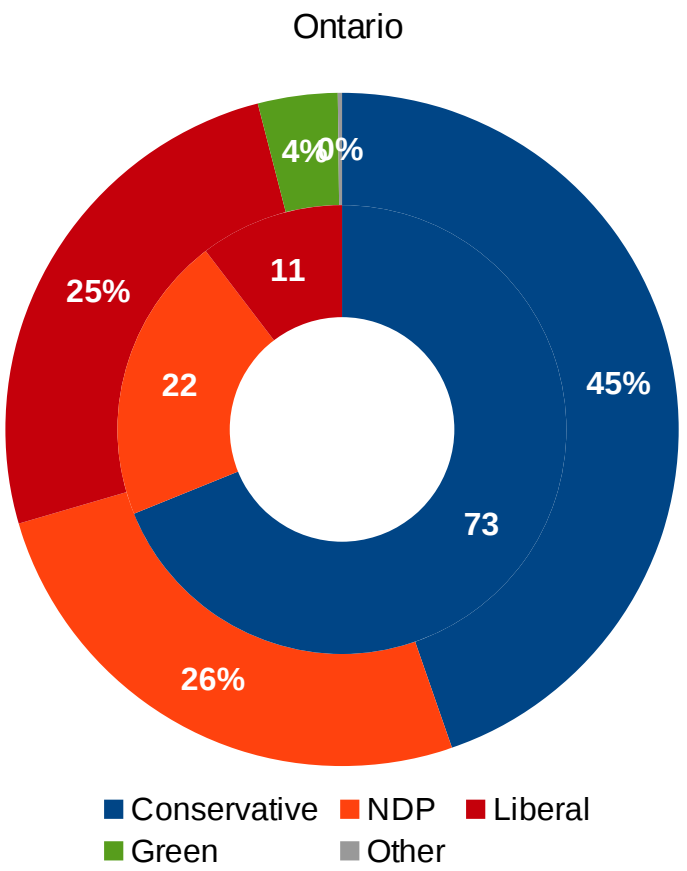
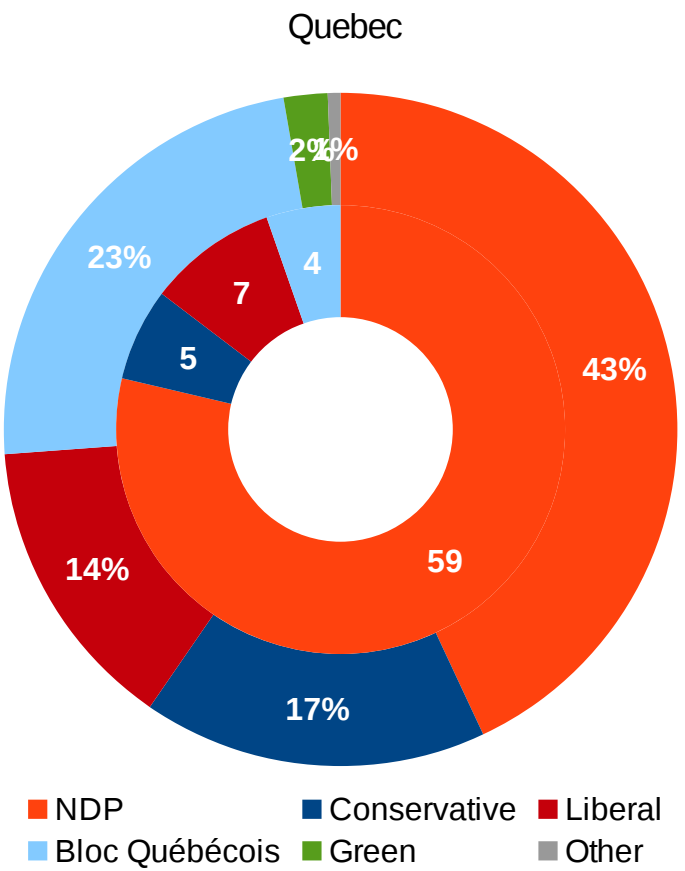
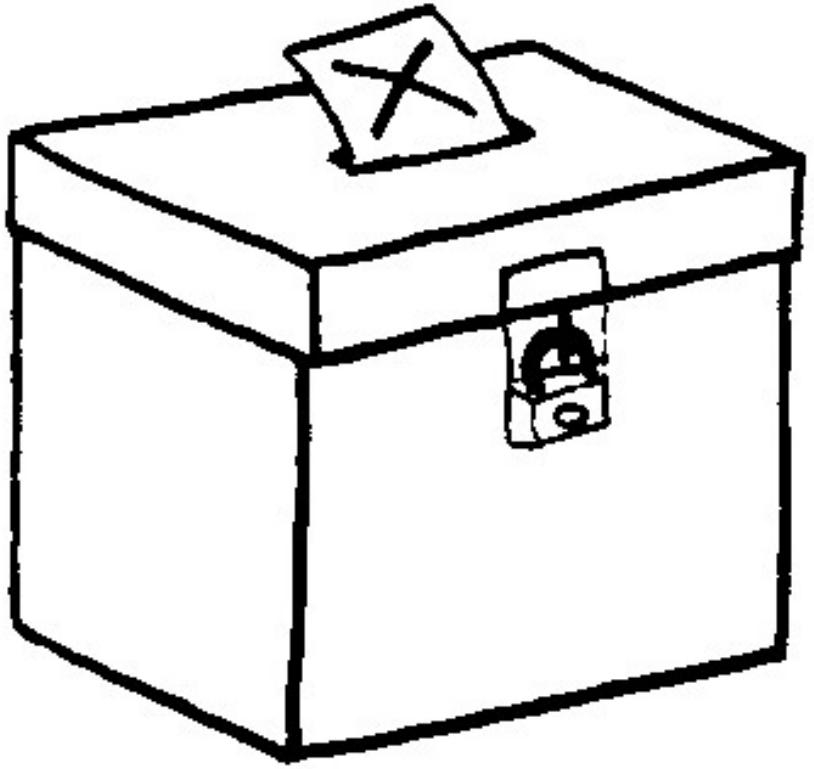




History of voting reform in Canada

- 1984 : Electoral Representation Commission (Québec)
- 1997 : Federal Majority government with lowest support
- 2001 : Fair Vote Canada is founded
- 2002 : Quebec's Estates-General on the Reform of Democratic Institutions
- 2004 : Quebec government study (Charest)
- 2004 : Law Commission of Canada report on ER
- 2005 : NB Commission on Legislative Democracy
- 2005 : PEI Plebiscite on voting reform
- 2005 : BC Citizens Assembly recommends STV
- 2006 : Quebec Citizens Committee Report
- 2007 : Ontario Citizens Assembly recommends MMP
- 2007 : Quebec's Chief Electoral Officer's Report
- 2009 : Second referendum on BC-STV

Voting systems



- The ballot
- Seats per electoral districts
- The algorithm (votes → seats)

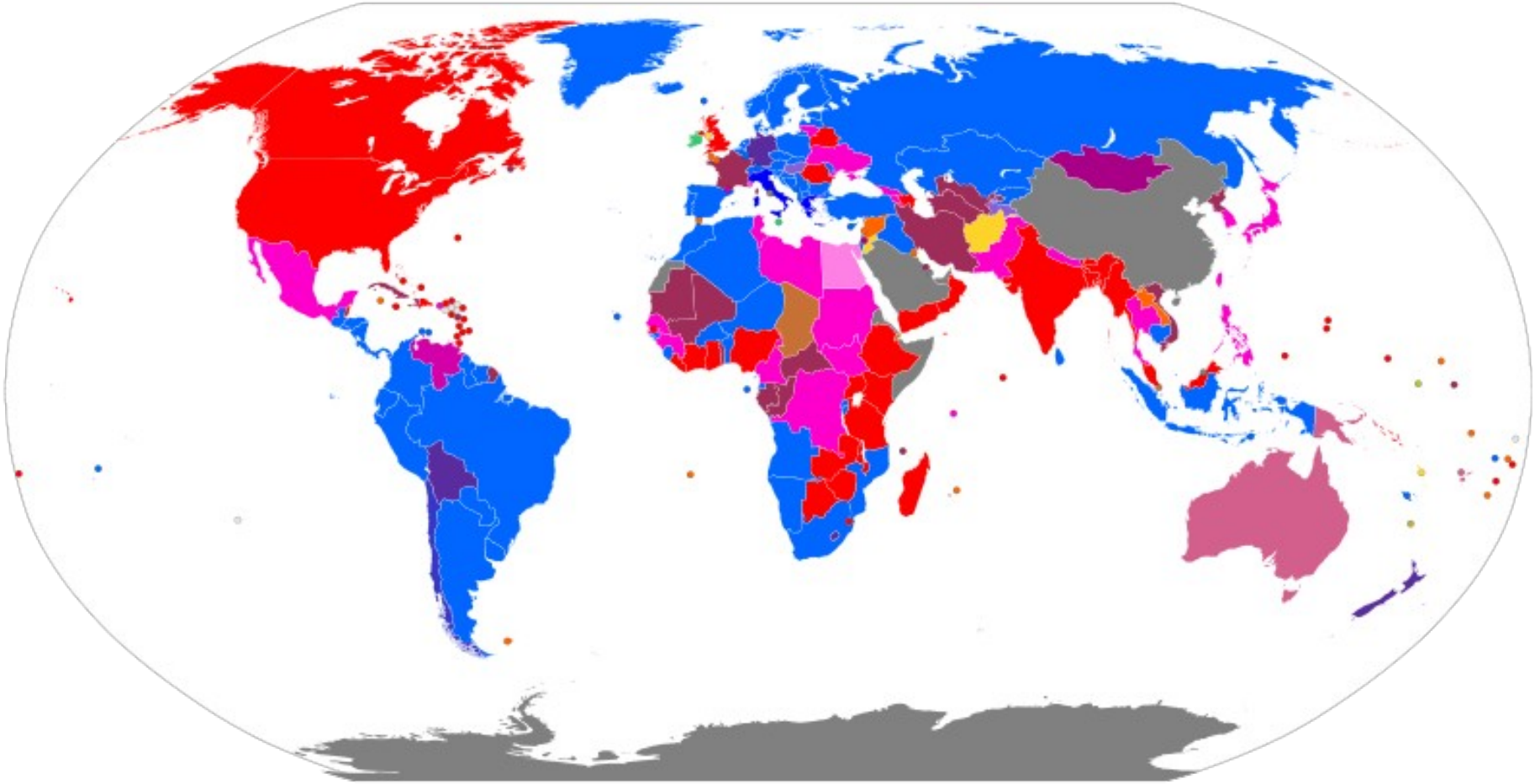
Single member plurality (First past the post)

The ballot:	One X per vote
Seats per electoral district:	308 ridings of one seat
The algorithm:	The seat is given to the candidate with at least 1 more vote than everyone else.

What is an electoral district?

- A bounded geographical area who's voters are represented by one ***or more*** legislators
- **Canada** : 308 electoral districts represented by 308 MPs
- **Australian senate** : 6 staes, each represented by 12 elected senators
- **Norway legislature** : 19 counties, each represented by 4 to 17 legislators

Who uses FPTP?



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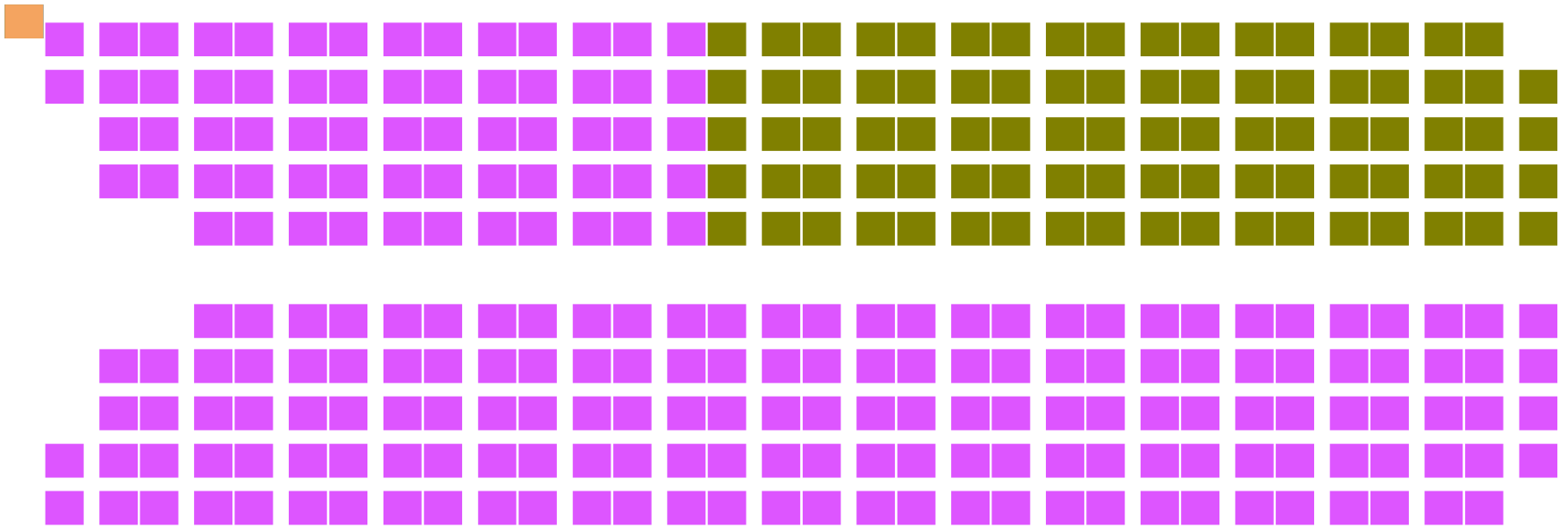
Legend : http://en.wikipedia.org/wiki/File:Electoral_systems_map.svg

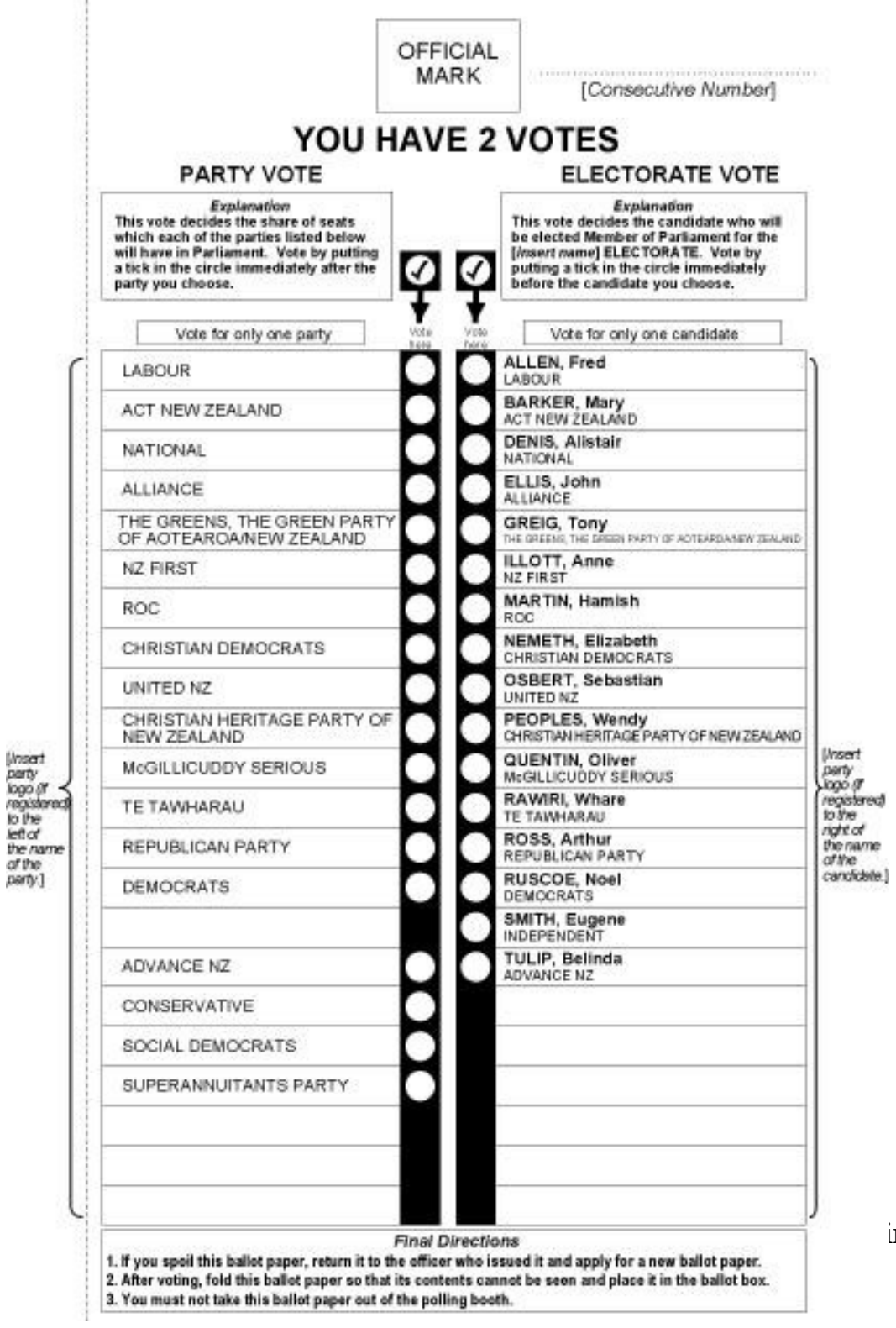
Mixed Member Proportional

Mixed Member Proportional
The seats & riding

- One seat per geographic ridings;
- List seats for ridings that span the entirety or parts of the jurisdiction;



Mixed Member Proportional : The ballot



OFFICIAL MARK

[Consecutive Number]

YOU HAVE 2 VOTES

PARTY VOTE

Explanation
This vote decides the share of seats which each of the parties listed below will have in Parliament. Vote by putting a tick in the circle immediately after the party you choose.

Vote for only one party

[Insert party logo (if registered) to the left of the name of the party.]

- LABOUR
- ACT NEW ZEALAND
- NATIONAL
- ALLIANCE
- THE GREENS, THE GREEN PARTY OF AOTEAROA/NEW ZEALAND
- NZ FIRST
- ROC
- CHRISTIAN DEMOCRATS
- UNITED NZ
- CHRISTIAN HERITAGE PARTY OF NEW ZEALAND
- McGILLICUDDY SERIOUS
- TE TAWHARAU
- REPUBLICAN PARTY
- DEMOCRATS
- ADVANCE NZ
- CONSERVATIVE
- SOCIAL DEMOCRATS
- SUPERANNUITANTS PARTY

ELECTORATE VOTE

Explanation
This vote decides the candidate who will be elected Member of Parliament for the [*insert name*] ELECTORATE. Vote by putting a tick in the circle immediately before the candidate you choose.

Vote for only one candidate

[Insert party logo (if registered) to the right of the name of the candidate.]

- **ALLEN, Fred** LABOUR
- **BARKER, Mary** ACT NEW ZEALAND
- **DENIS, Alistair** NATIONAL
- **ELLIS, John** ALLIANCE
- **GREIG, Tony** THE GREENS, THE GREEN PARTY OF AOTEAROA/NEW ZEALAND
- **ILLOTT, Anne** NZ FIRST
- **MARTIN, Hamish** ROC
- **NEMETH, Elizabeth** CHRISTIAN DEMOCRATS
- **OSBERT, Sebastian** UNITED NZ
- **PEOPLES, Wendy** CHRISTIAN HERITAGE PARTY OF NEW ZEALAND
- **QUENTIN, Oliver** McGILLICUDDY SERIOUS
- **RAWIRI, Whare** TE TAWHARAU
- **ROSS, Arthur** REPUBLICAN PARTY
- **RUSCOE, Noel** DEMOCRATS
- **SMITH, Eugene** INDEPENDENT
- **TULIP, Belinda** ADVANCE NZ

Final Directions
1. If you spoil this ballot paper, return it to the officer who issued it and apply for a new ballot paper.
2. After voting, fold this ballot paper so that its contents cannot be seen and place it in the ballot box.
3. You must not take this ballot paper out of the polling booth.

- Two votes :
  - One for local candidate
  - One for party

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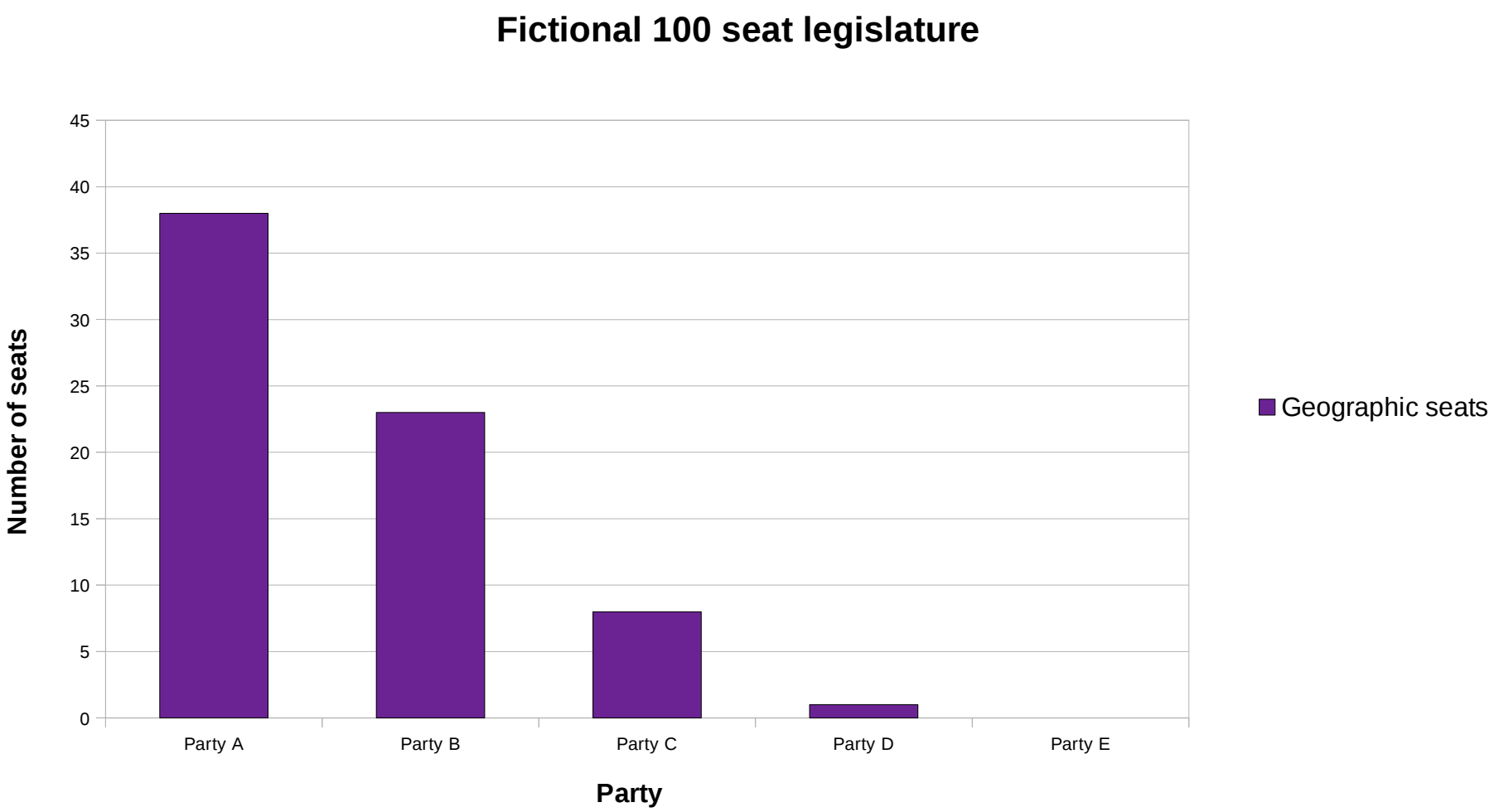
Mixed Member Proportional
The algorithm

- Winner of geographic seats are determined first
- List seats compensate for lack of proportionality
- Some additional algorithm if its open lists (see Voting Counts:Electoral Reform for Canada, Law Commission of Canada, 2004, p. 106)

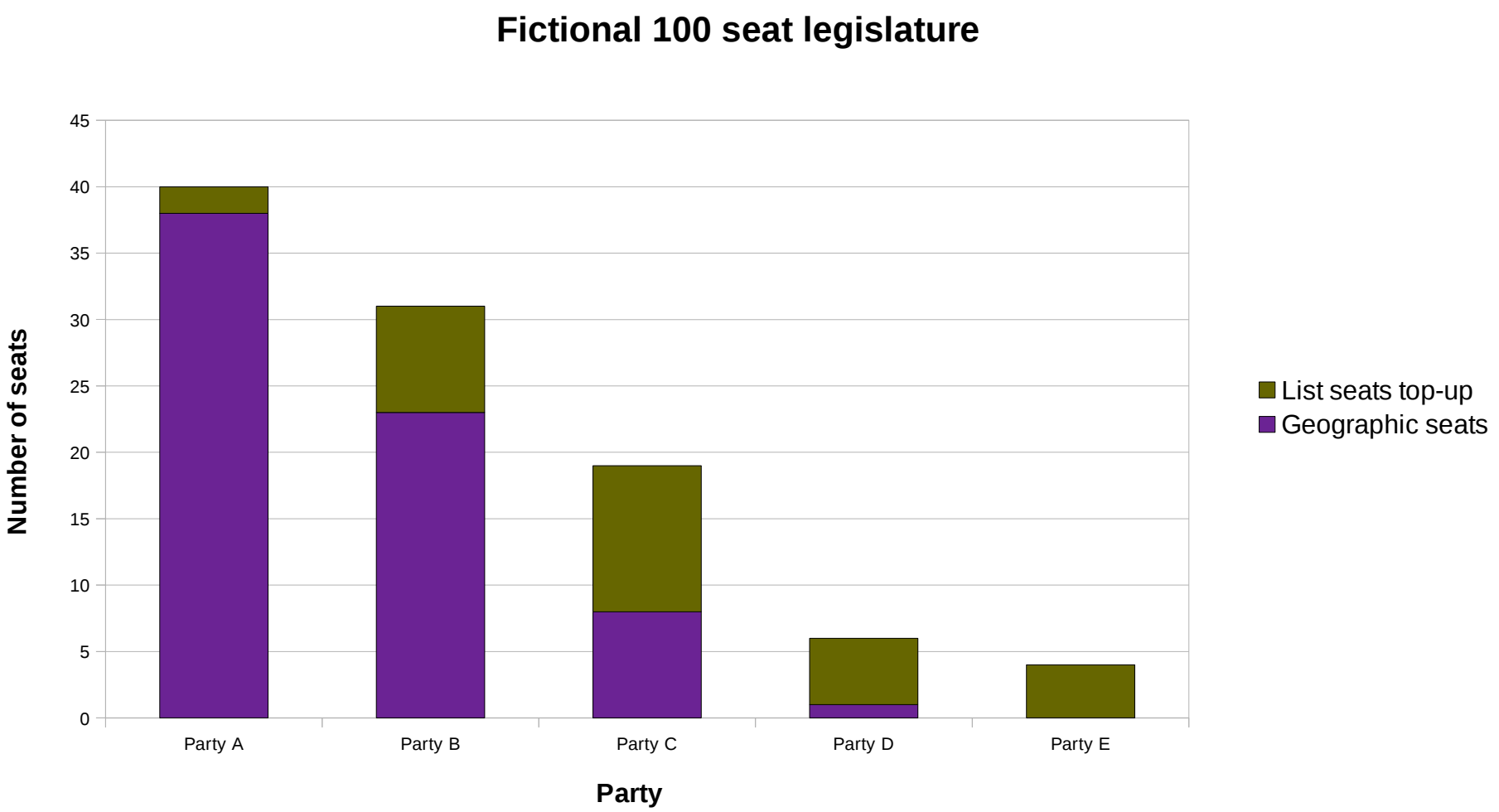
MMP : The algorithm

Fictional legislature of 100 seats			
	Geographic seats	**% of vote**	**List seats**
Party A	38	40%	2
Party B	23	31%	8
Party C	8	19%	11
Party D	1	6%	5
Party E	0	4%	4
Total	70	100%	30

MMP : The algorithm



MMP : The algorithm



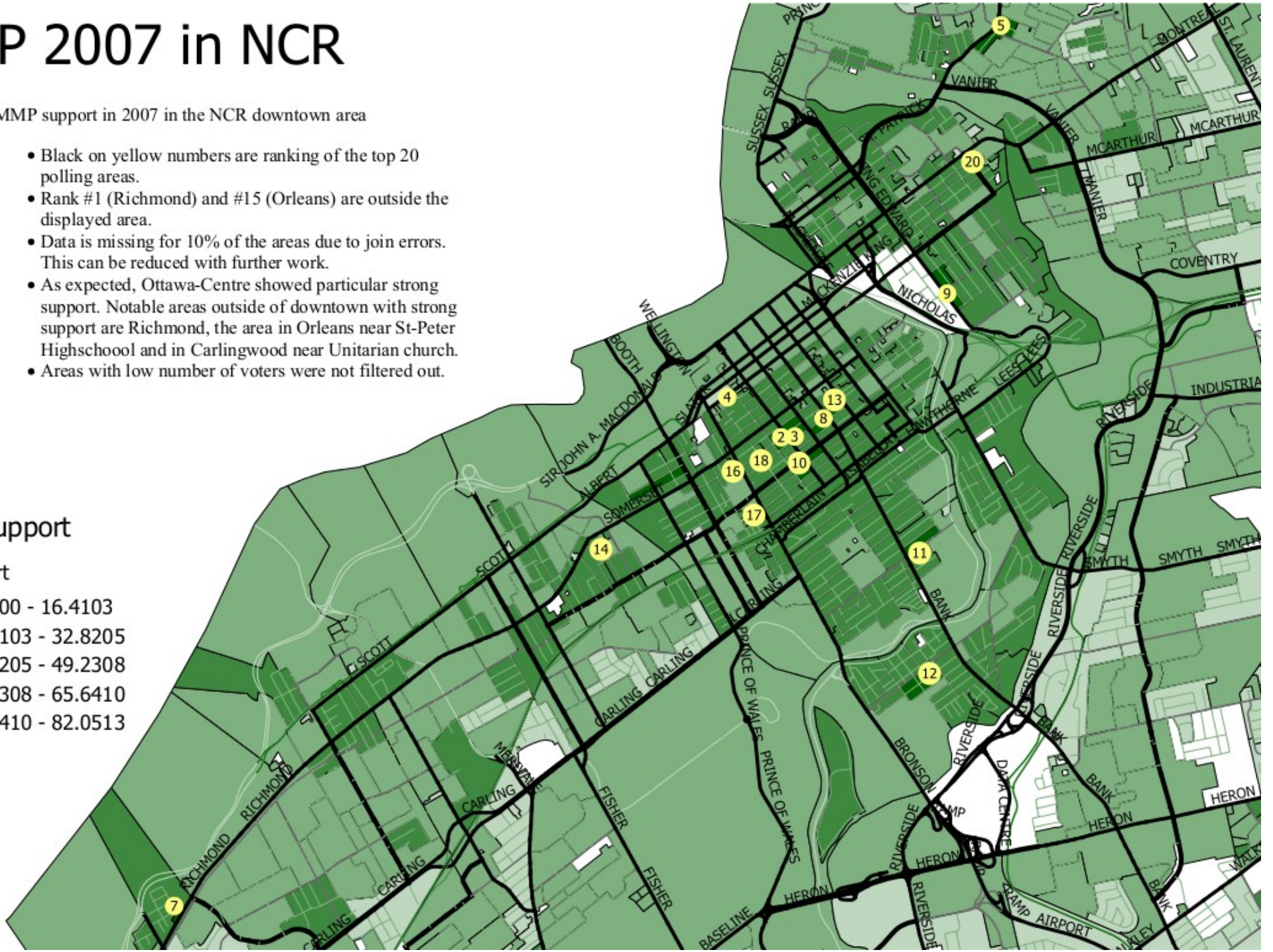
Mixed Member Proportional

The ballot:	•One vote for a party •One vote for a candidate
Seats per electoral district:	•50%-70% are local electoral district •Remainder are list seats
The algorithm:	•Geographic seats first determined •List seats compensate for lack of proportionality

MMP 2007 in NCR

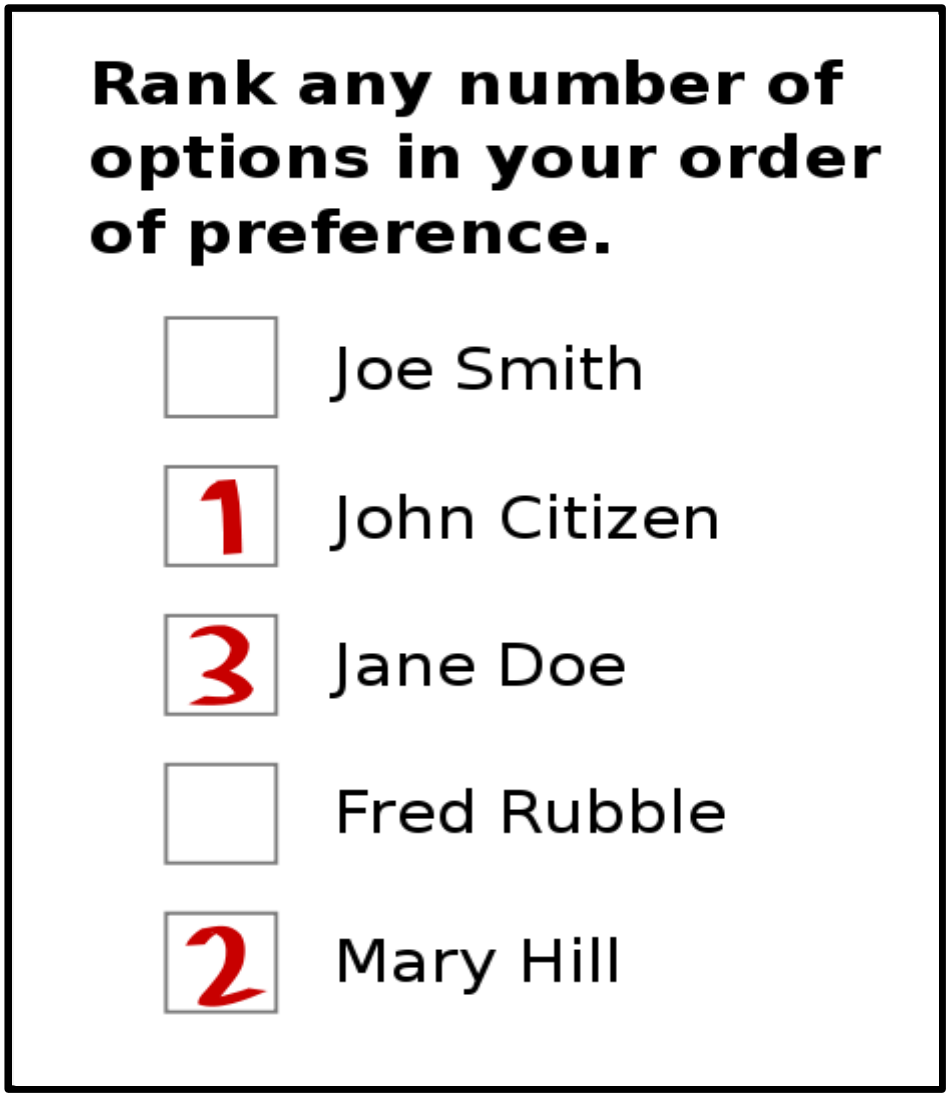
MMP support in 2007 in the NCR downtown area

- Black on yellow numbers are ranking of the top 20 polling areas.
- Rank #1 (Richmond) and #15 (Orleans) are outside the displayed area.
- Data is missing for 10% of the areas due to join errors. This can be reduced with further work.
- As expected, Ottawa-Centre showed particular strong support. Notable areas outside of downtown with strong support are Richmond, the area in Orleans near St-Peter Highschoool and in Carlingwood near Unitarian church.
- Areas with low number of voters were not filtered out.



Single Transferable Vote

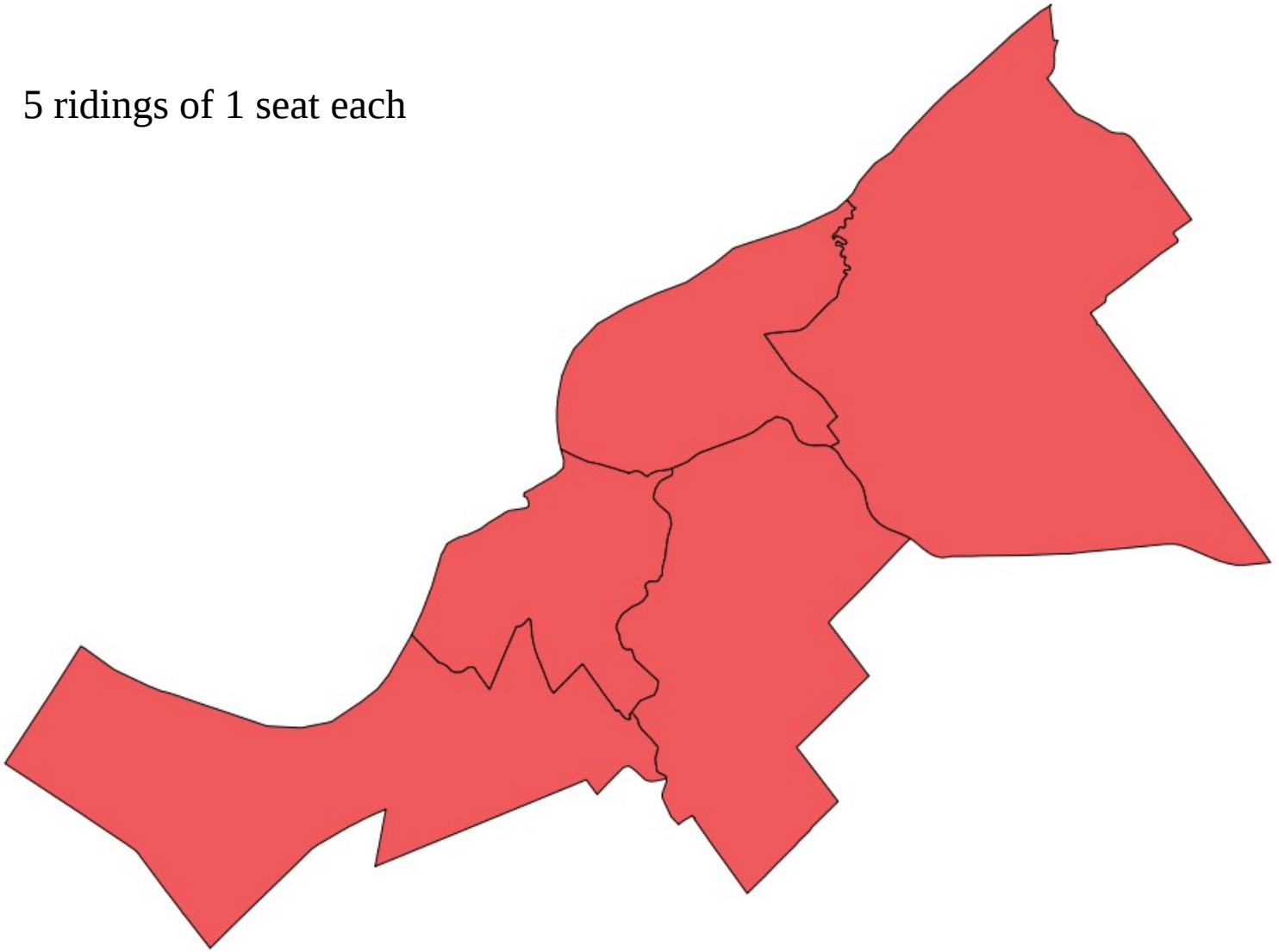
Single Transferable Vote: The ballot



- Ranked vote
- No party list

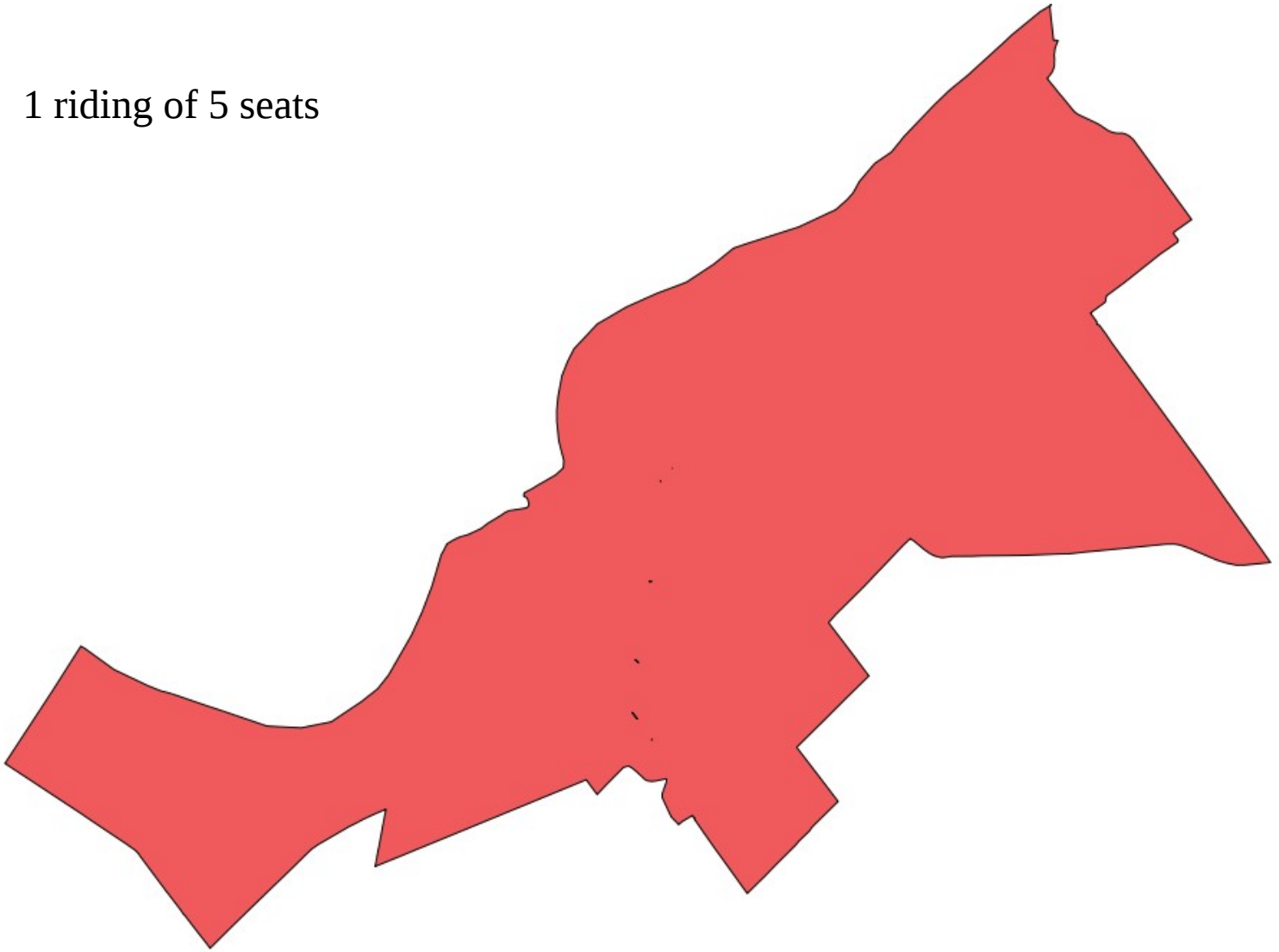
Single Tranferable Vote : The district & seats

5 ridings of 1 seat each

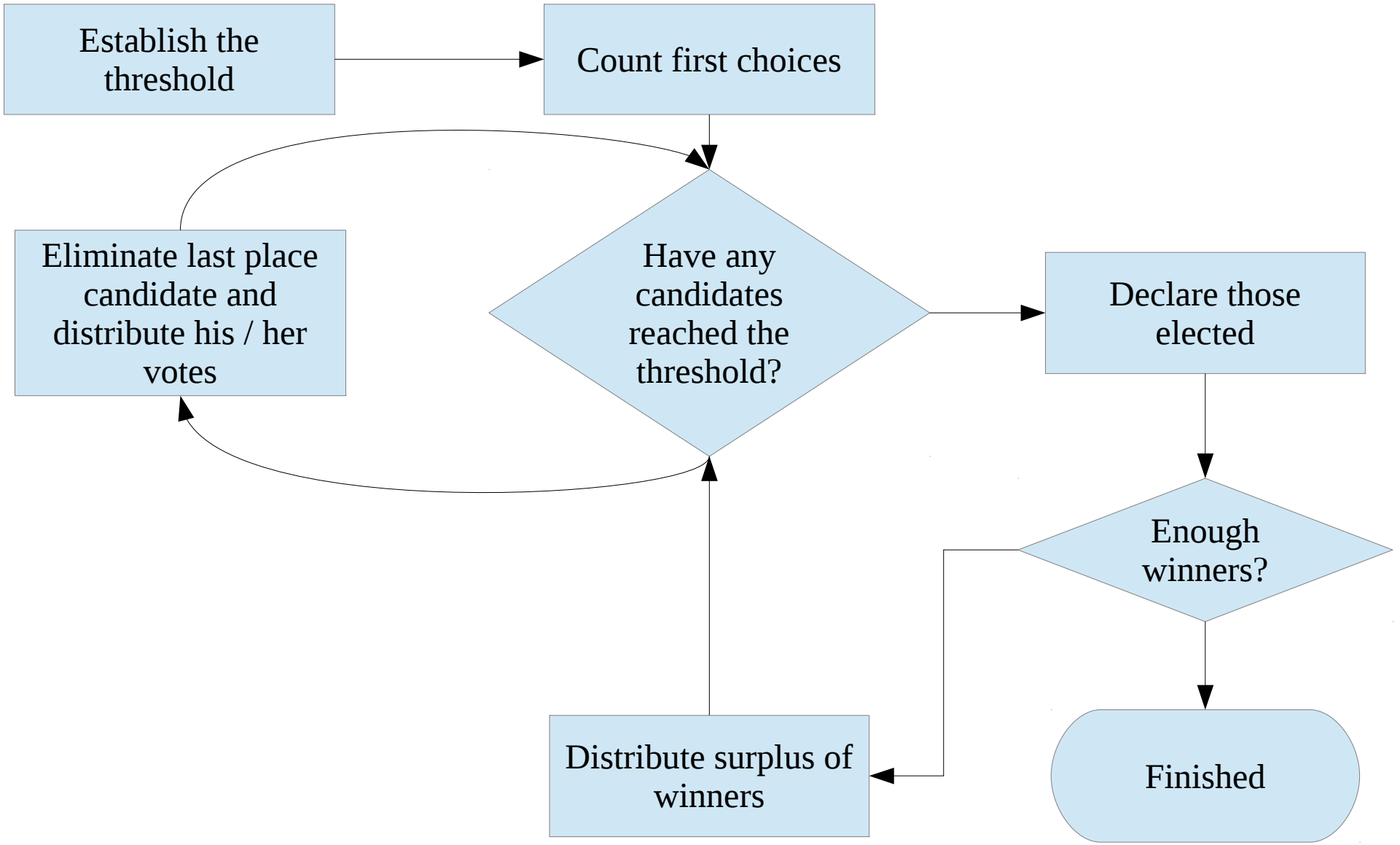


Single Tranferable Vote : The district & seats

1 riding of 5 seats

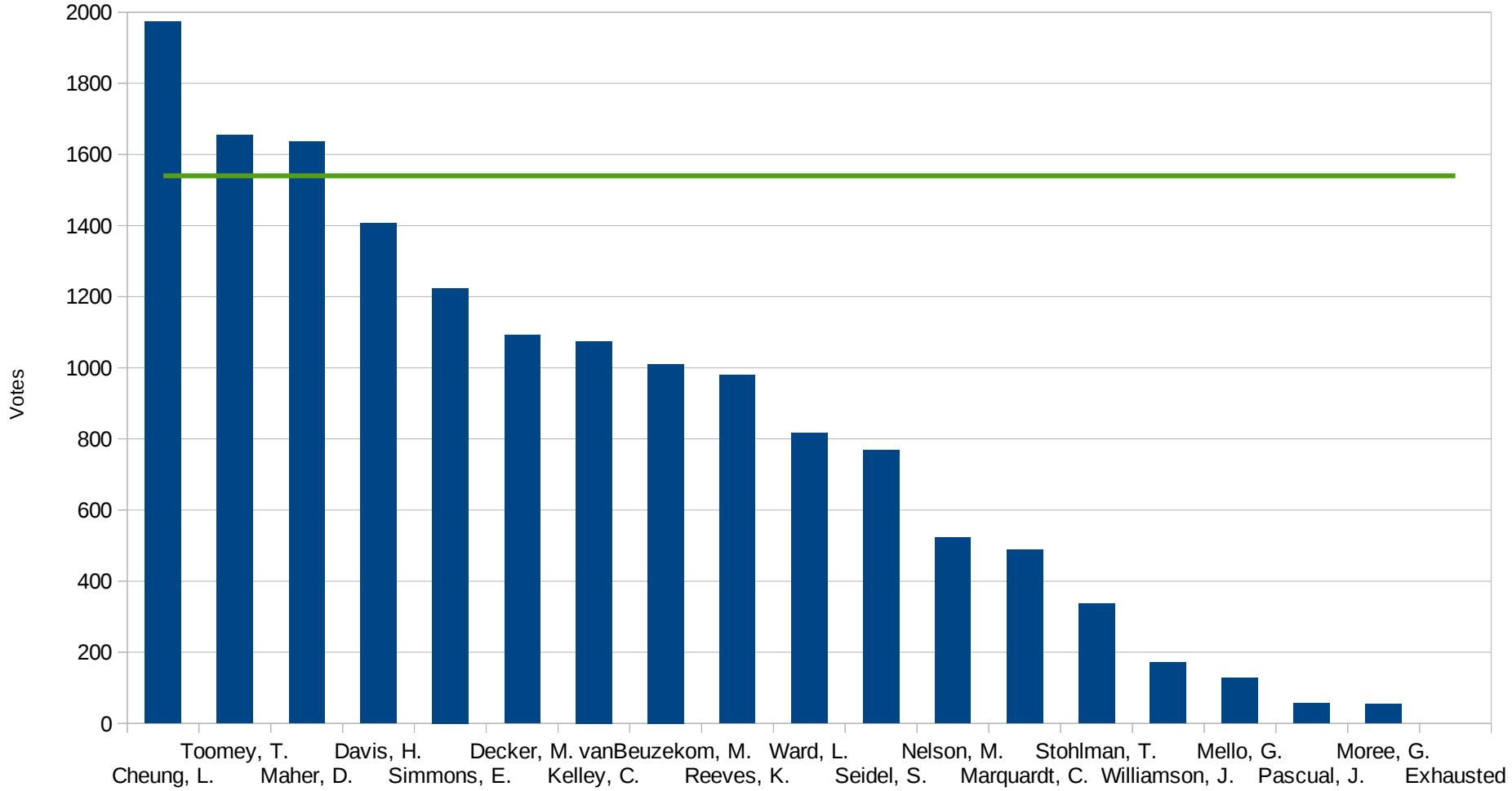


Single Transferable Vote
The algorithm



Cambridge, Massachussetts

City Council Elections, November 8th, 2011



Single Transferable Vote
The algorithm

Formula:

$$\text{threshold} = \left(\frac{\text{valid votes}}{\text{seats} + 1} \right) + 1$$

Example of 1 seat :

$$50\% + 1 = \left(\frac{100\% \text{ of votes}}{1 \text{ seat} + 1} \right) + 1$$

Example of Cambridge Massachussetts :

$$1540 = \left(\frac{15393 \text{ votes}}{9 \text{ seats} + 1} \right) + 1$$

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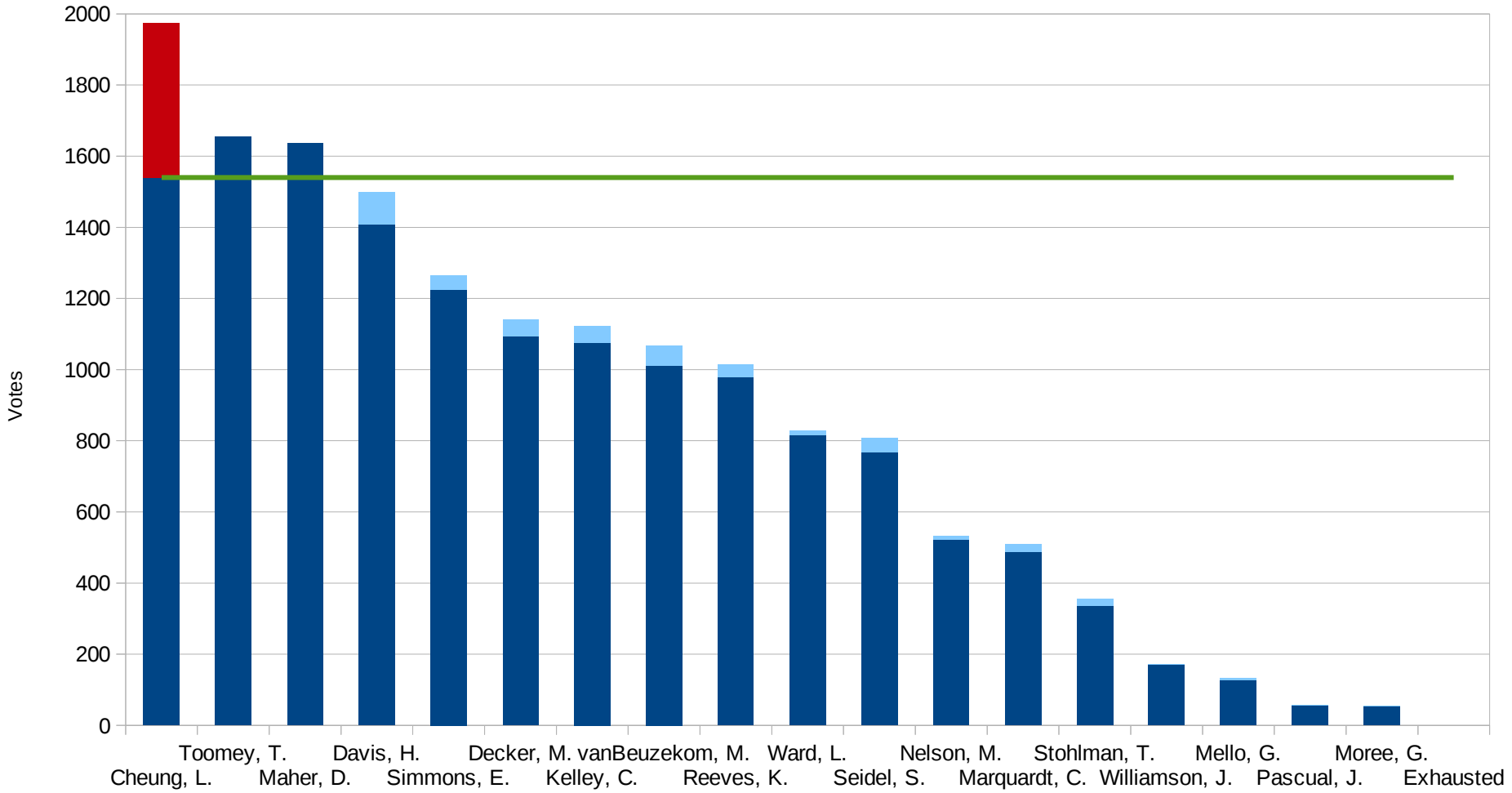

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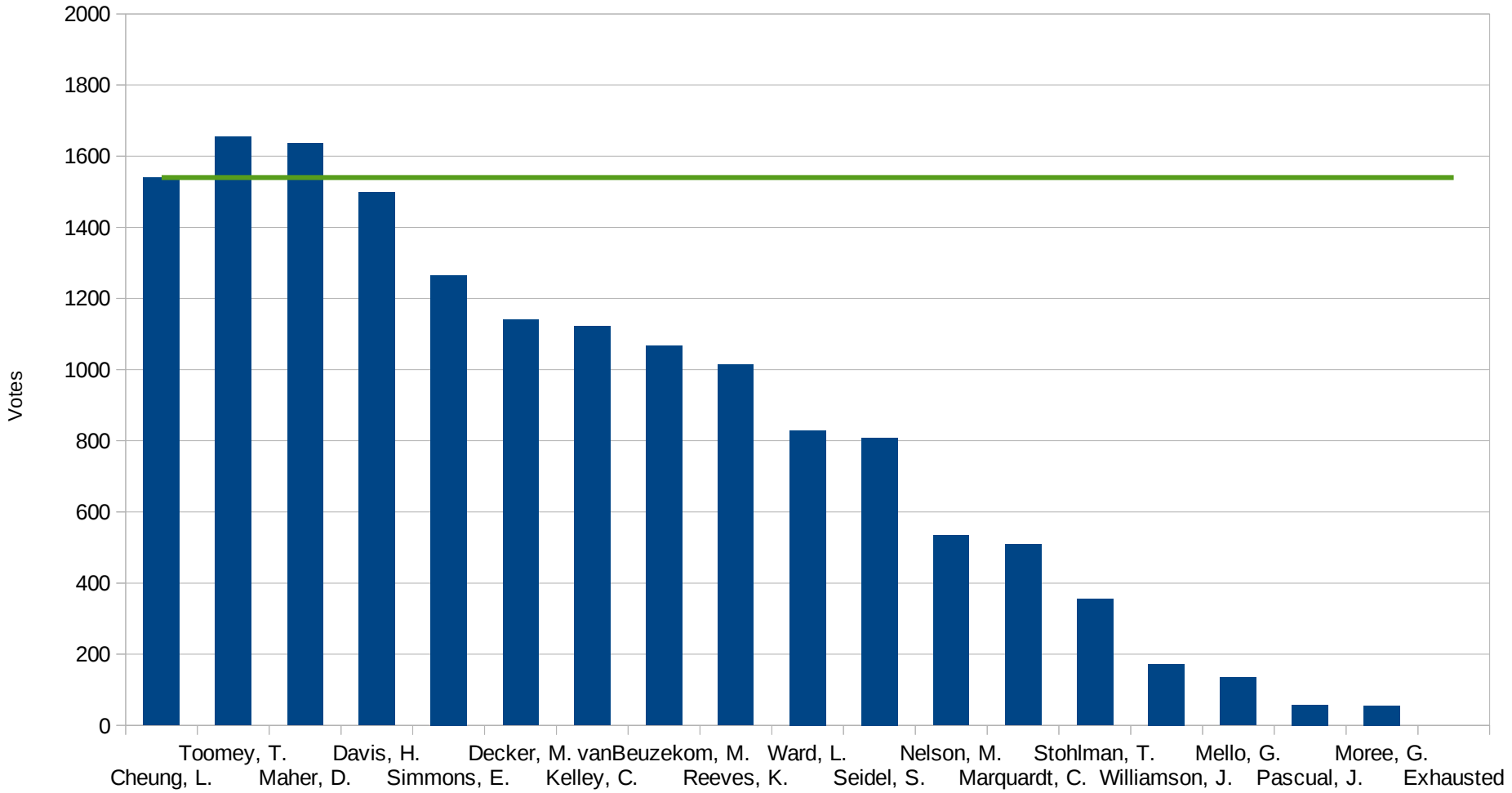

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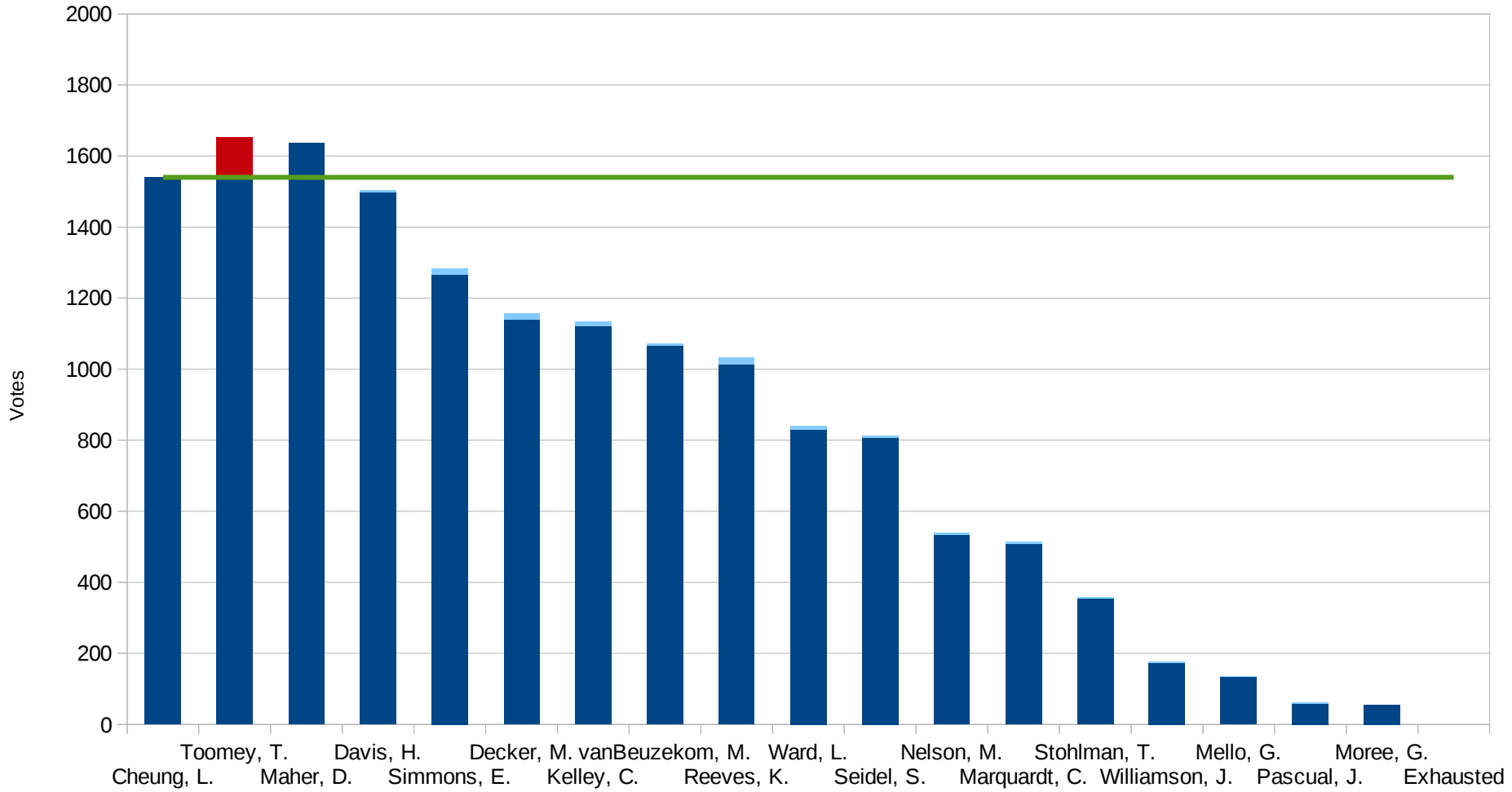

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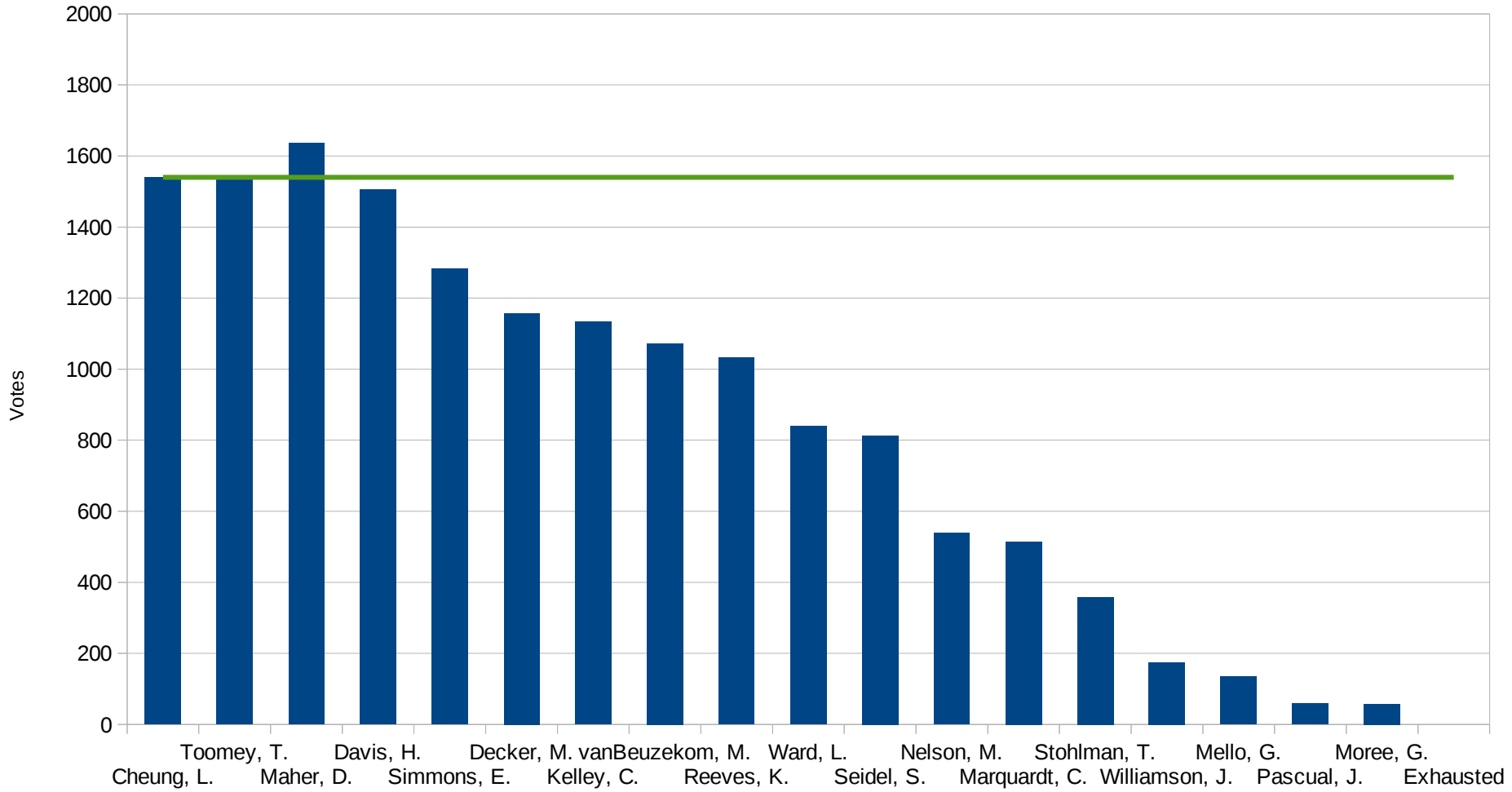

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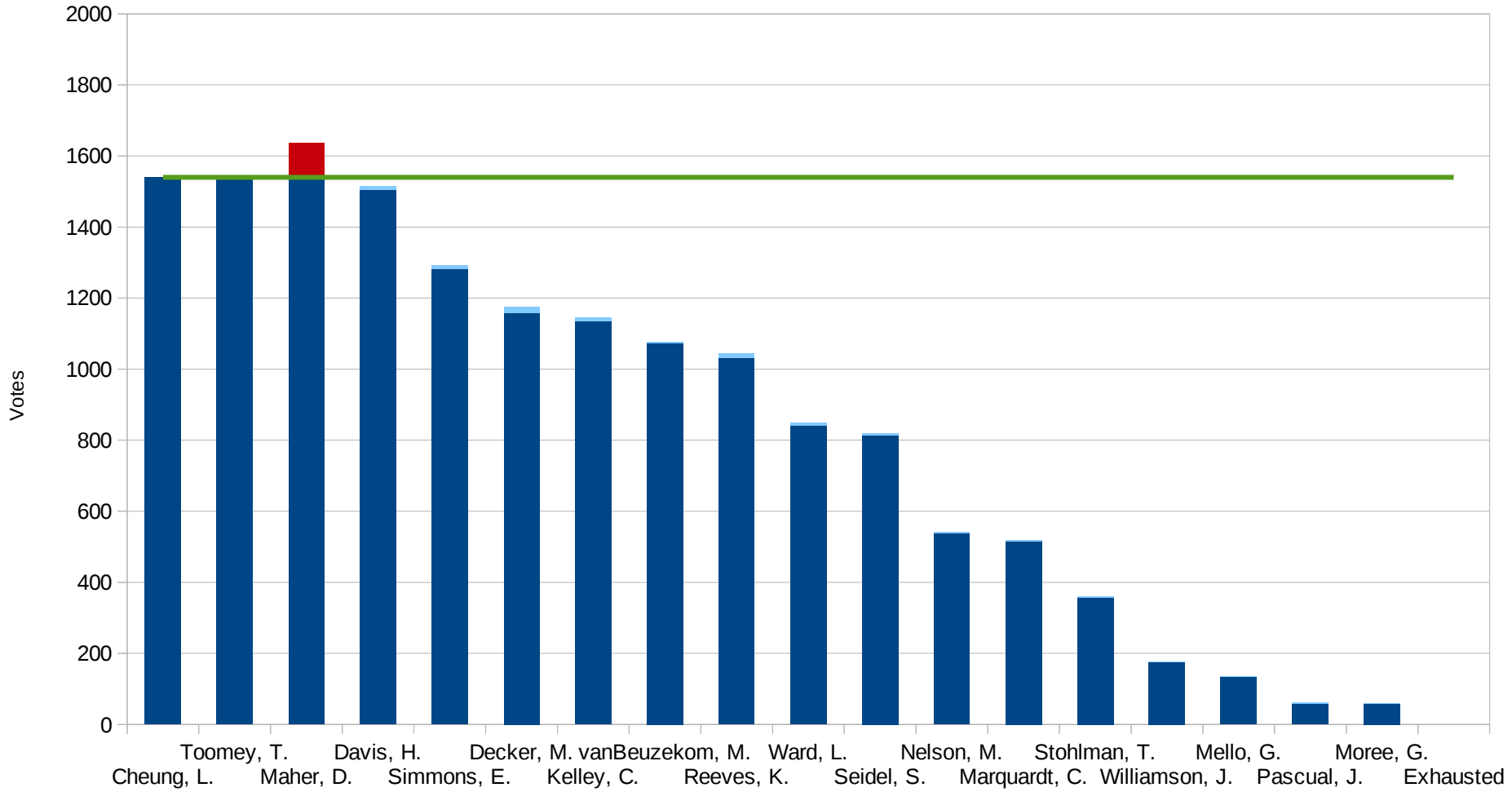

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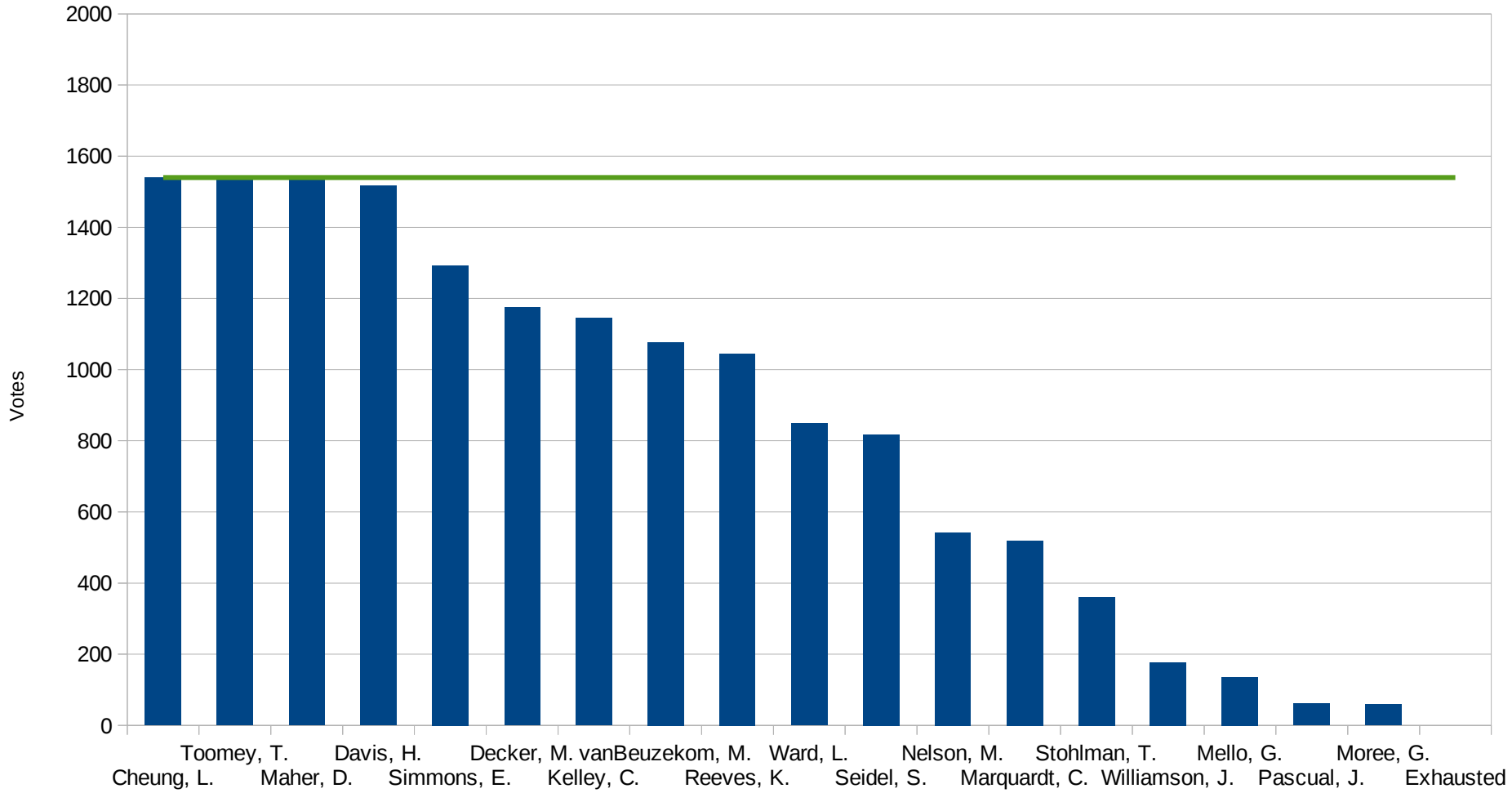

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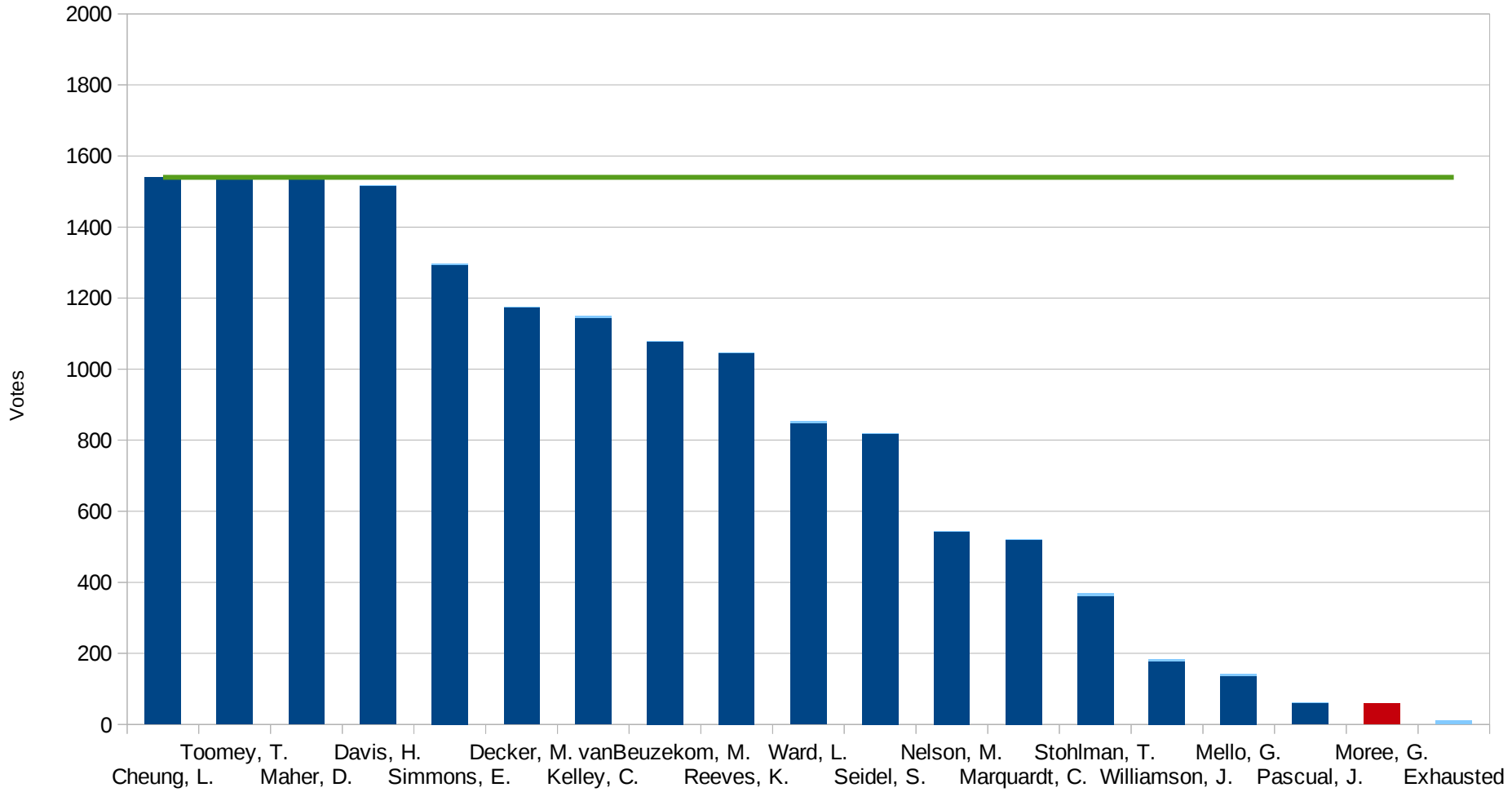

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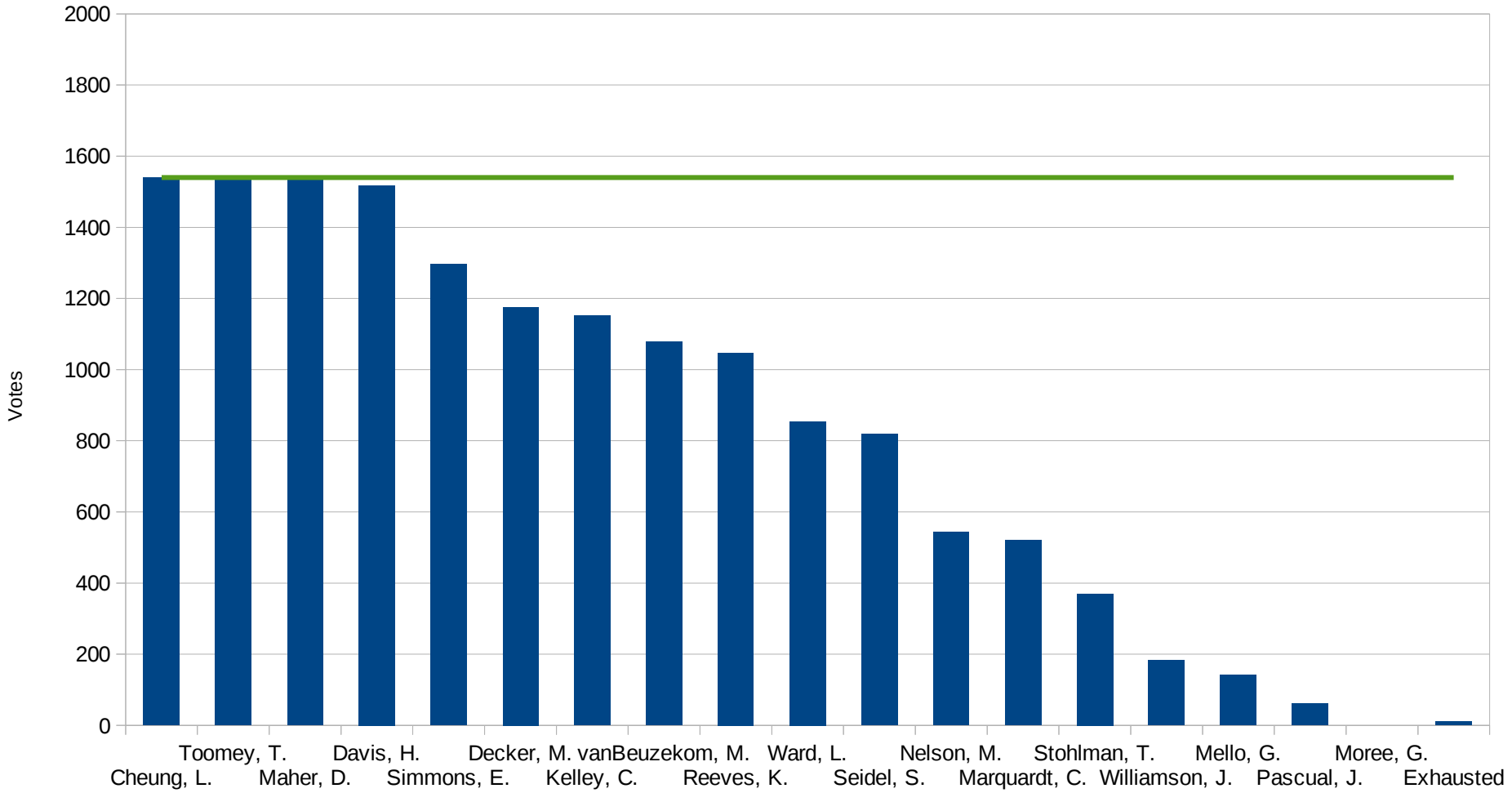

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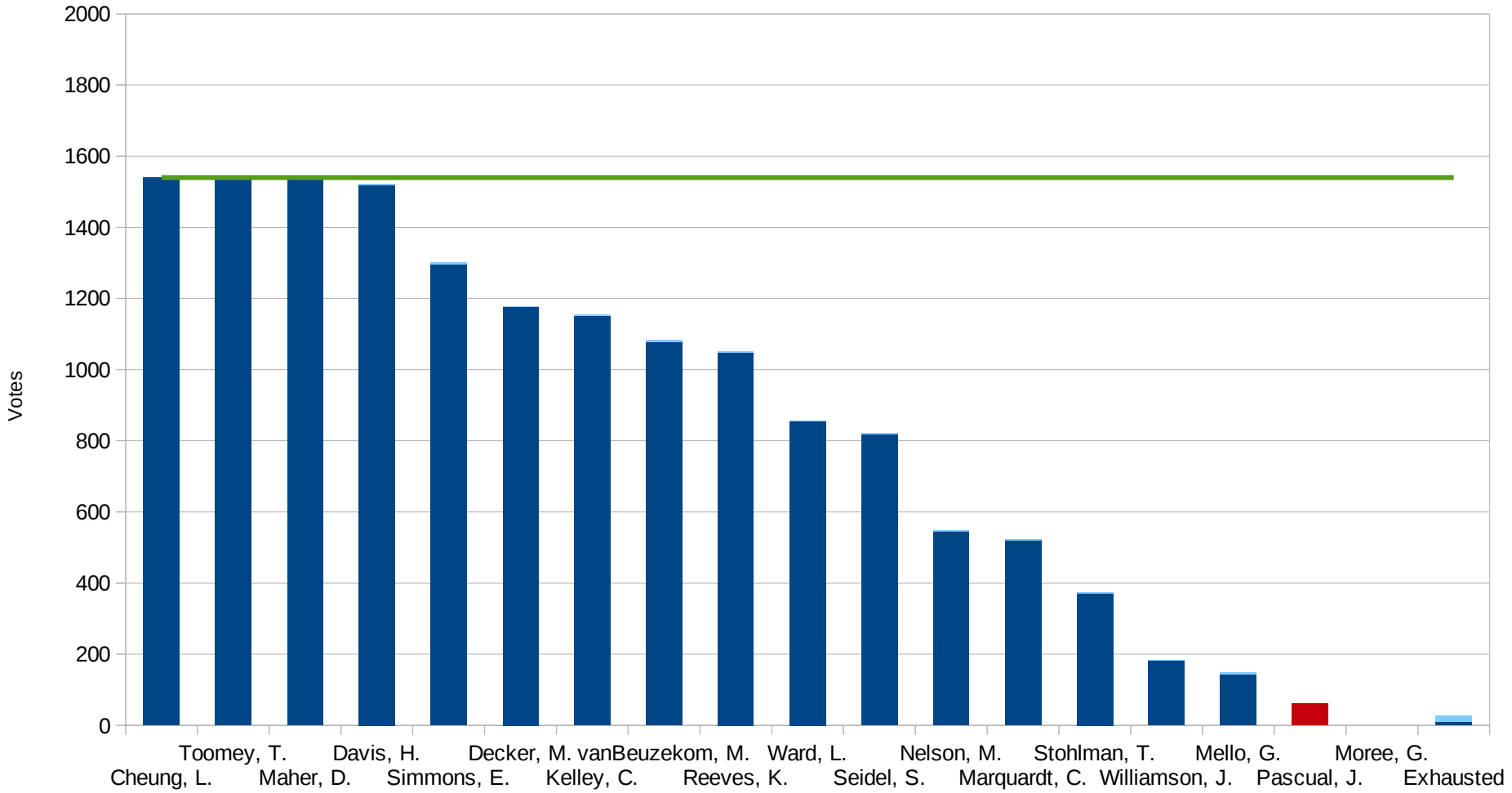

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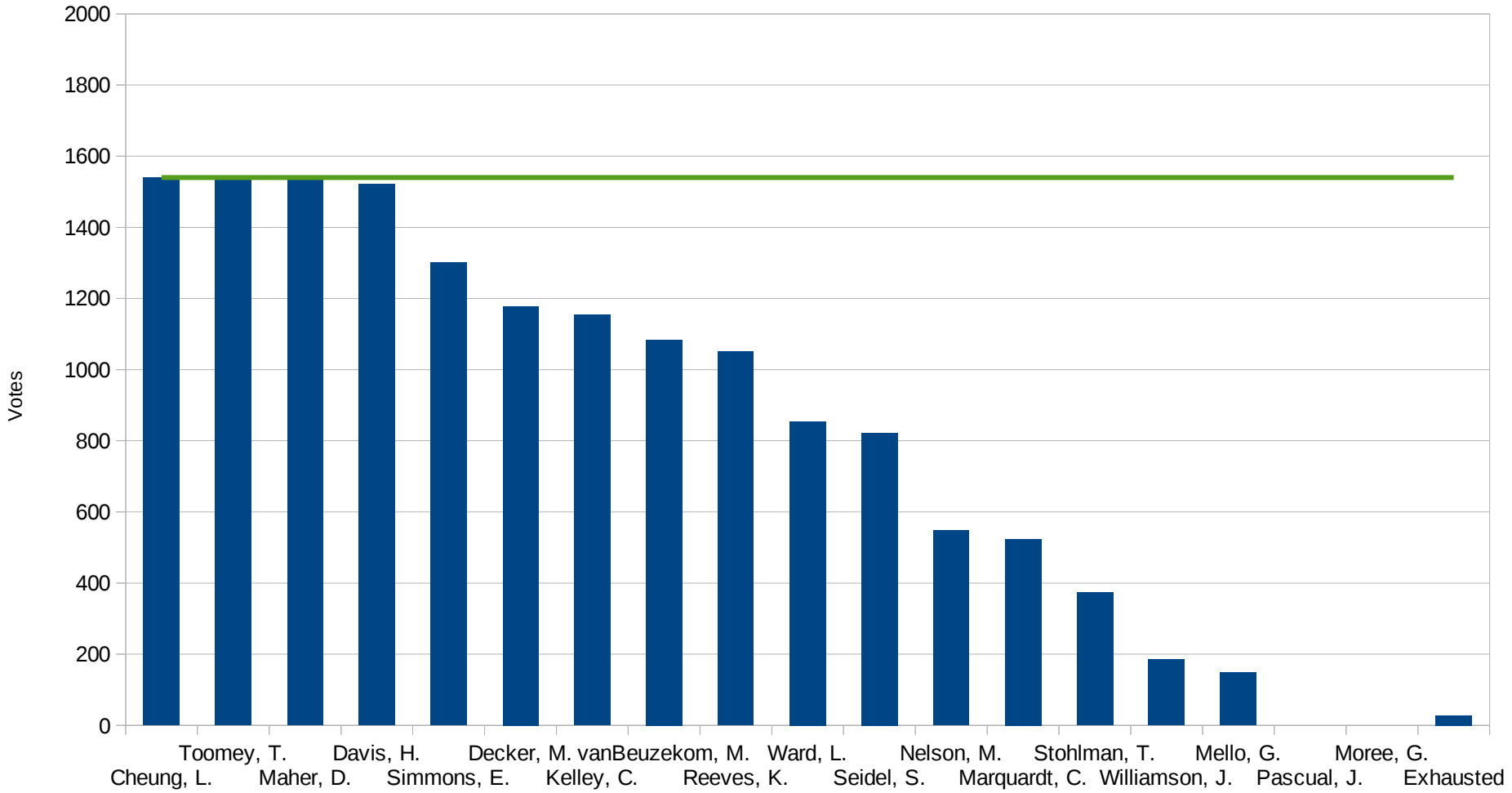

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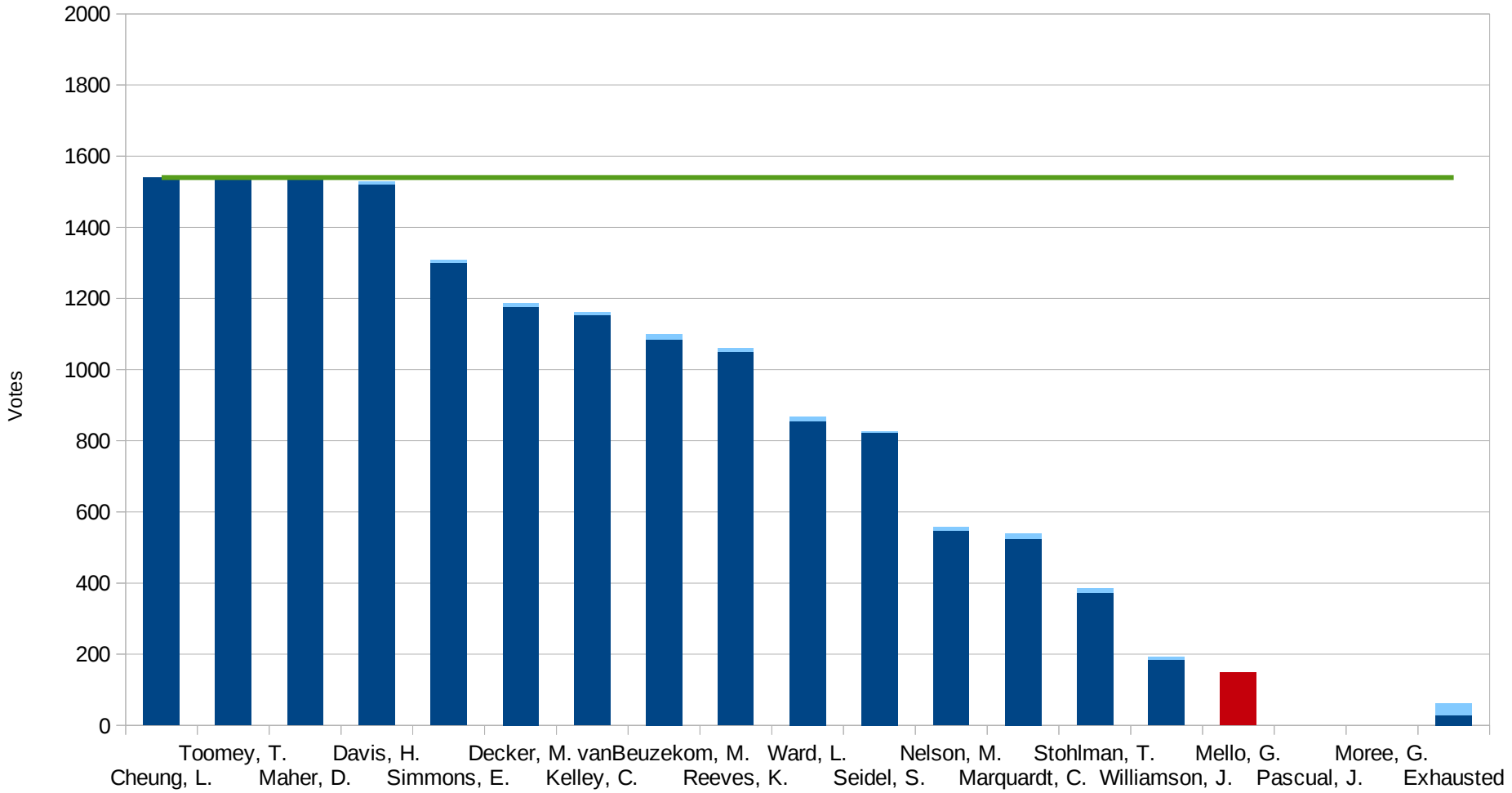

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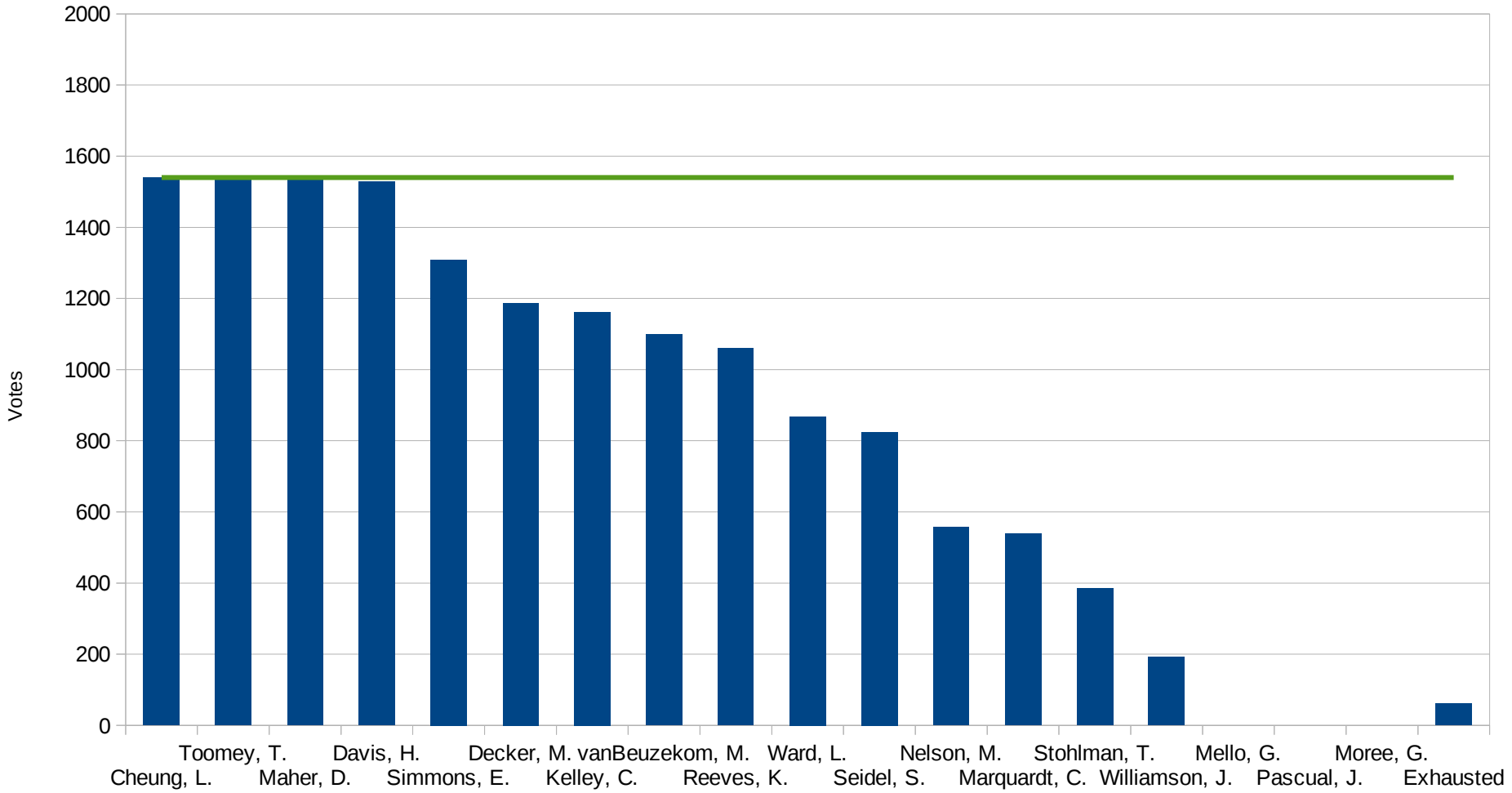

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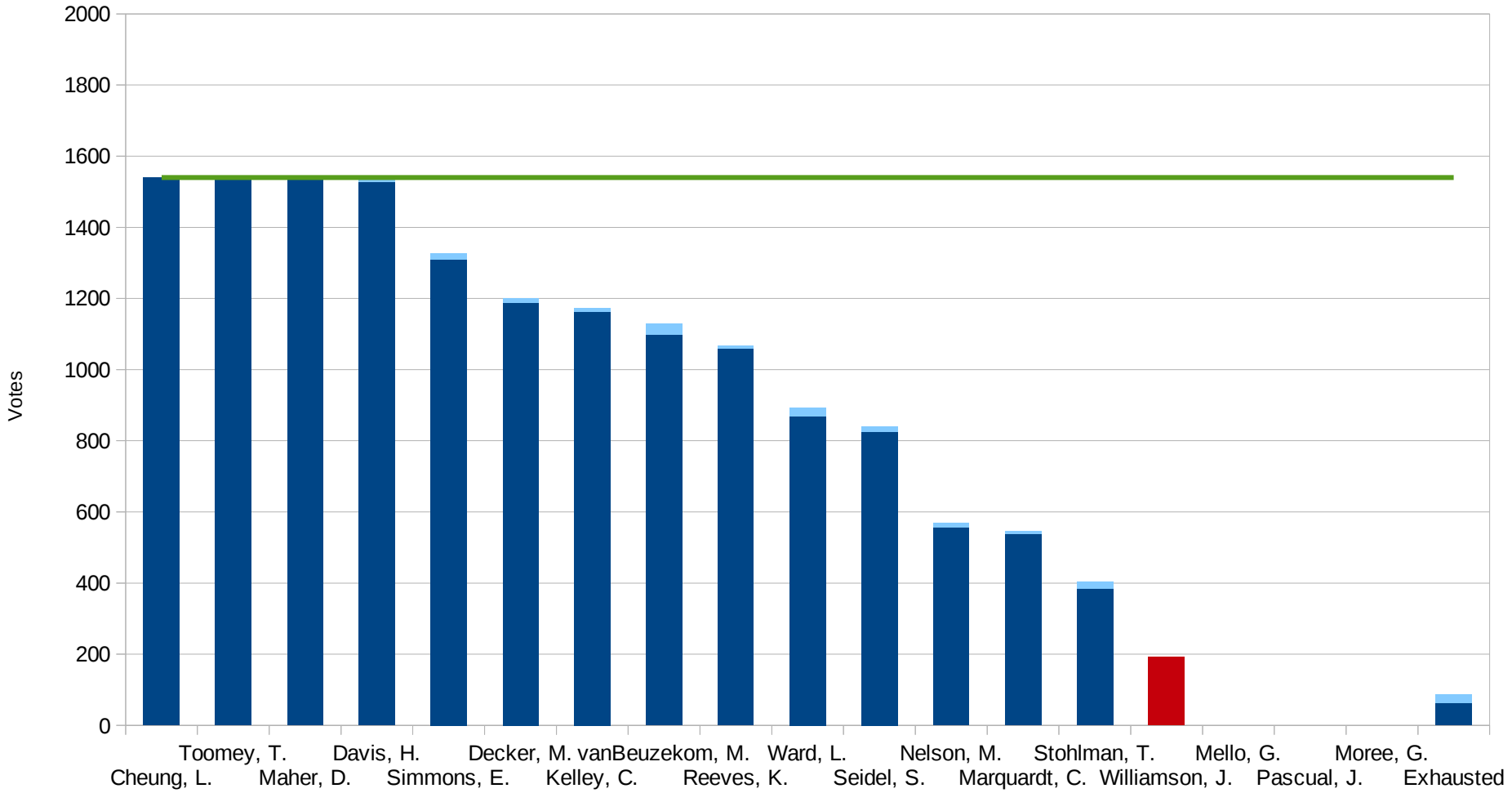

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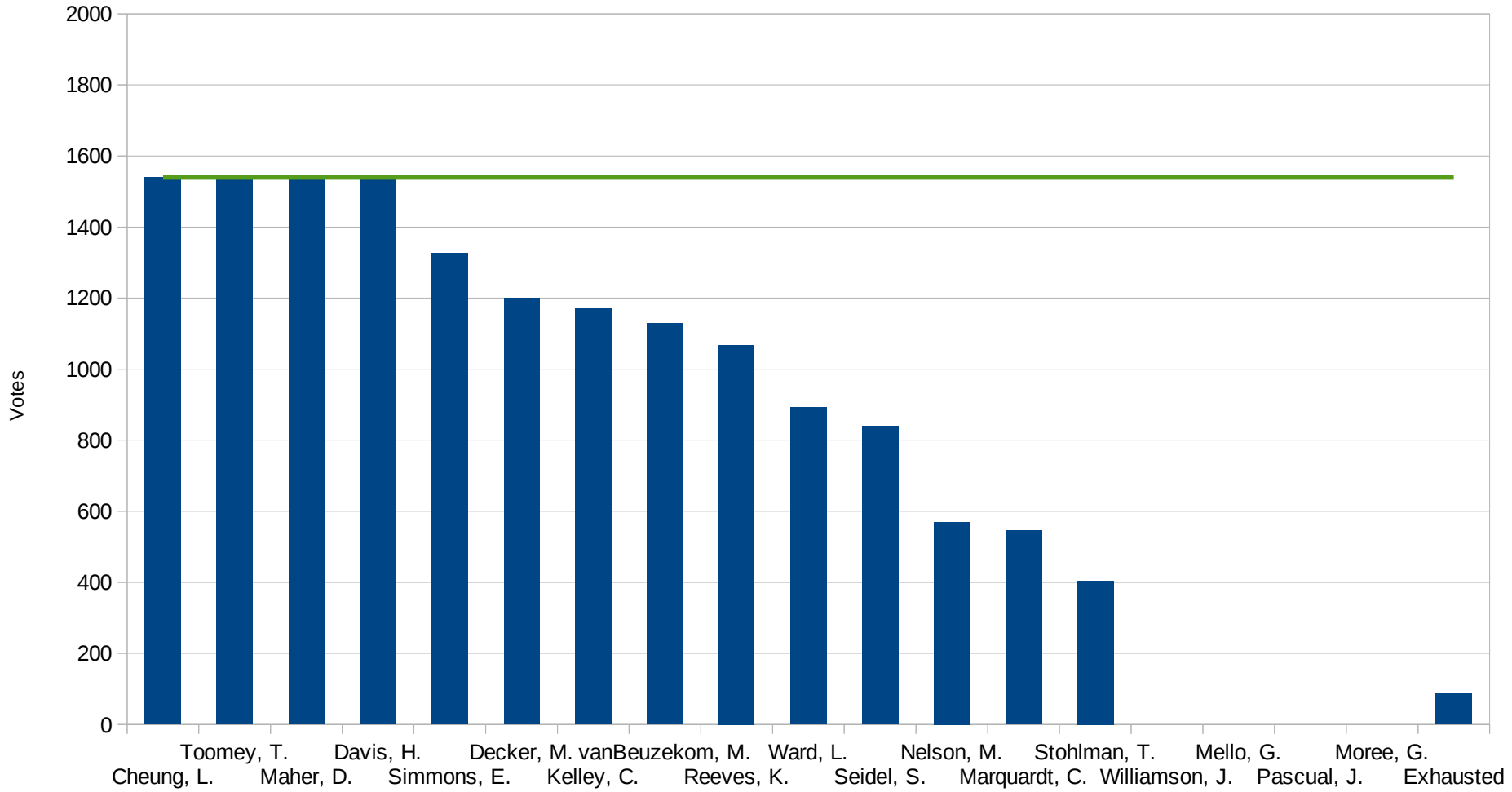

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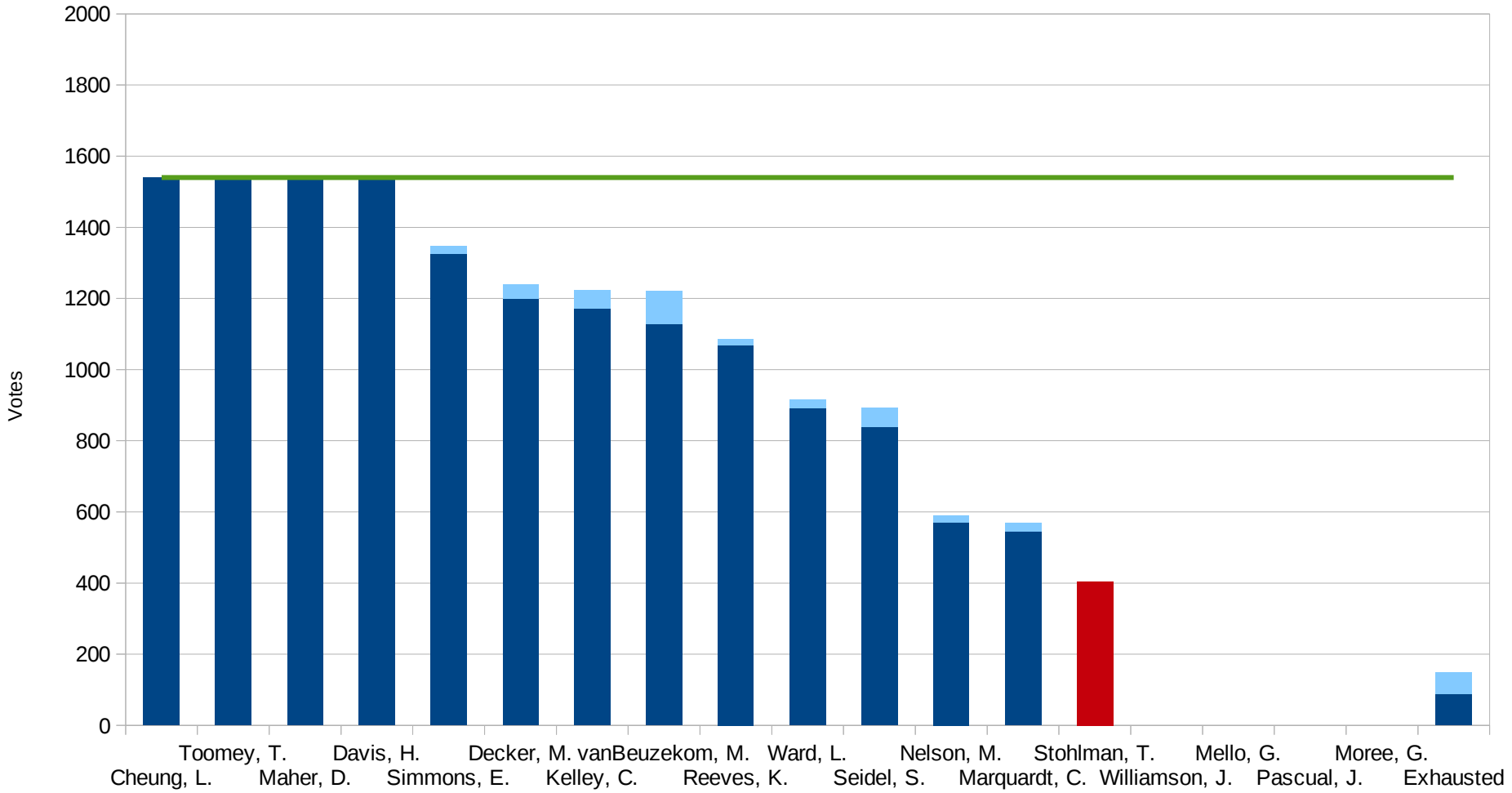

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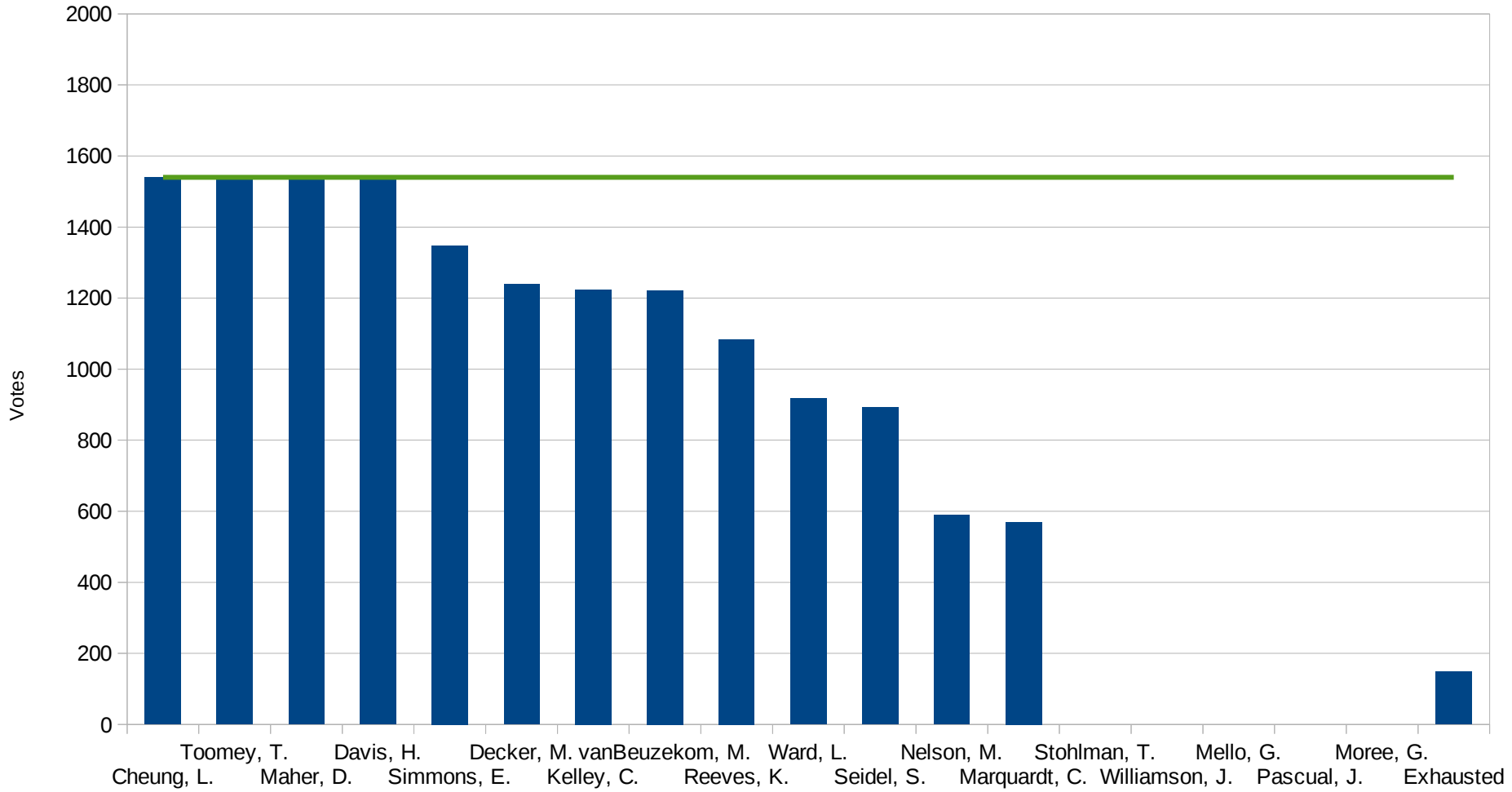

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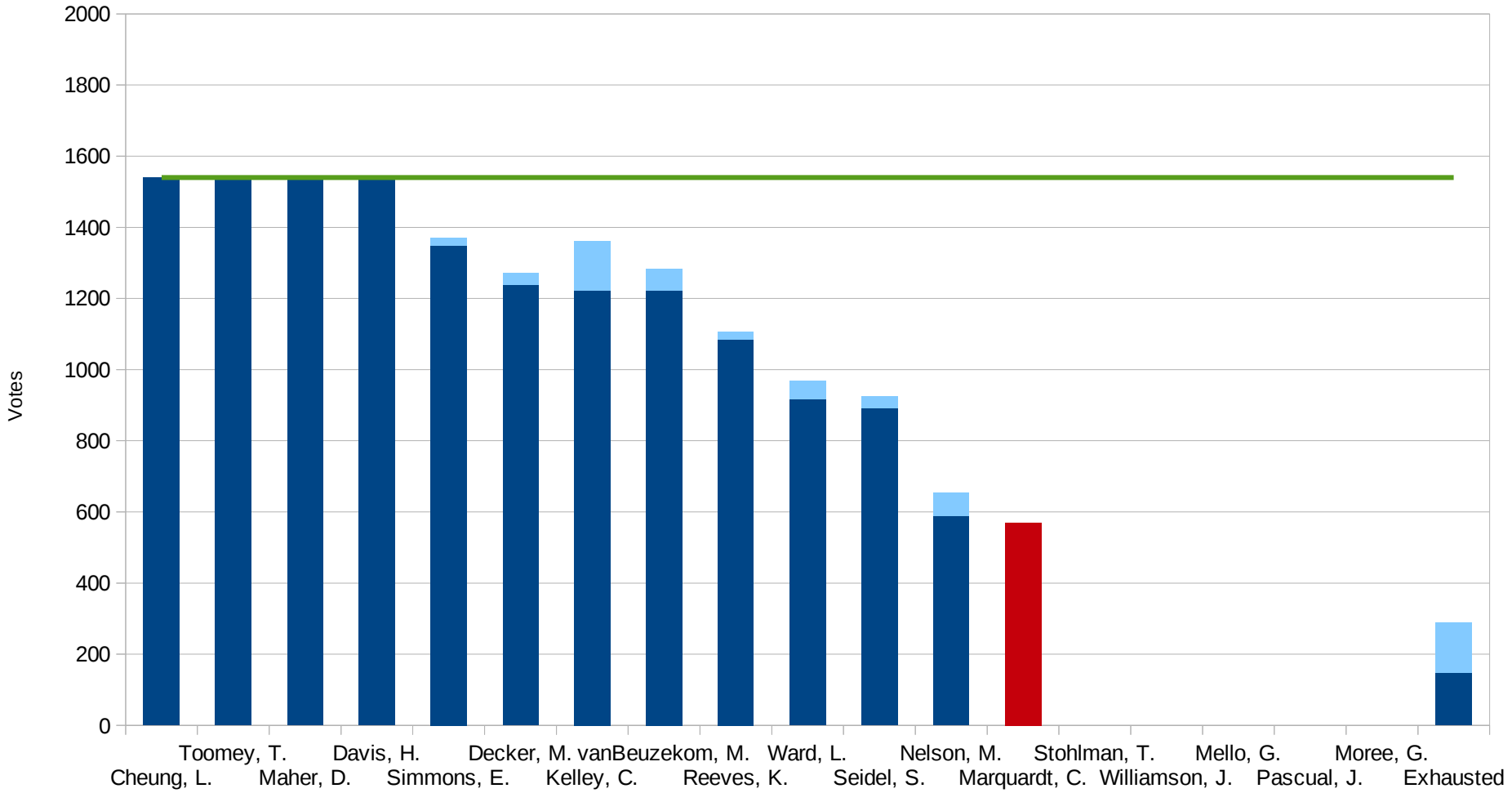

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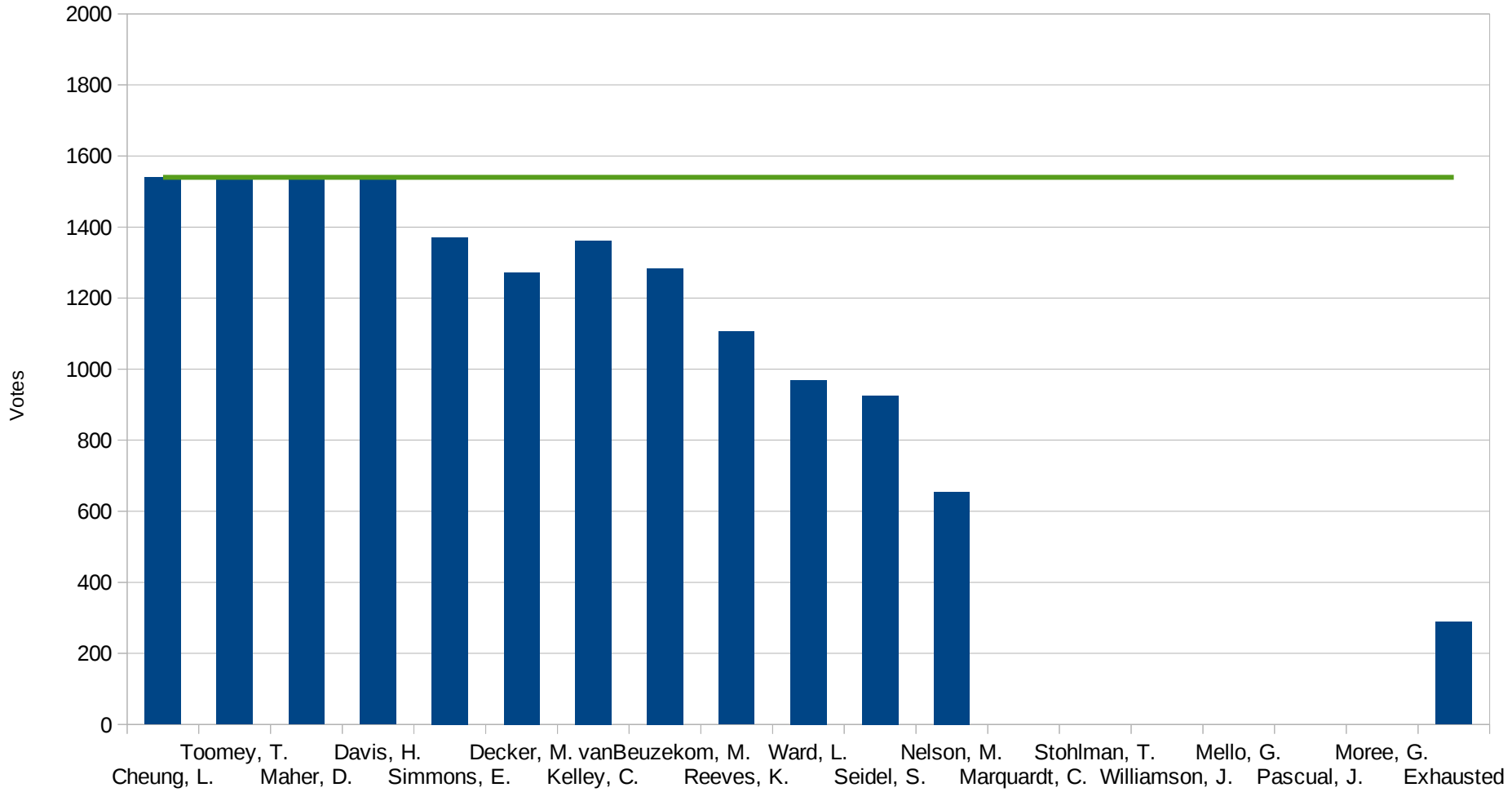

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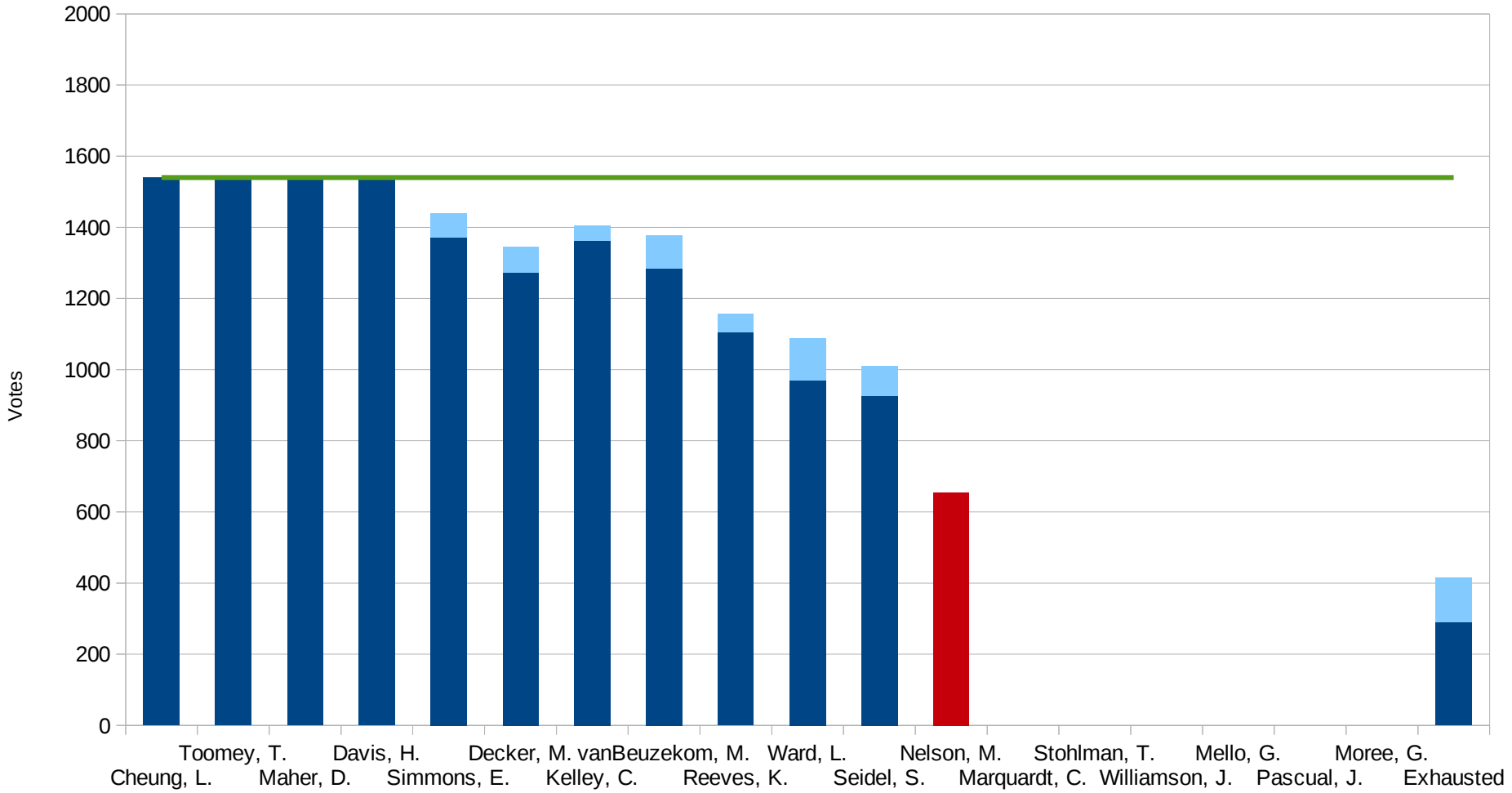

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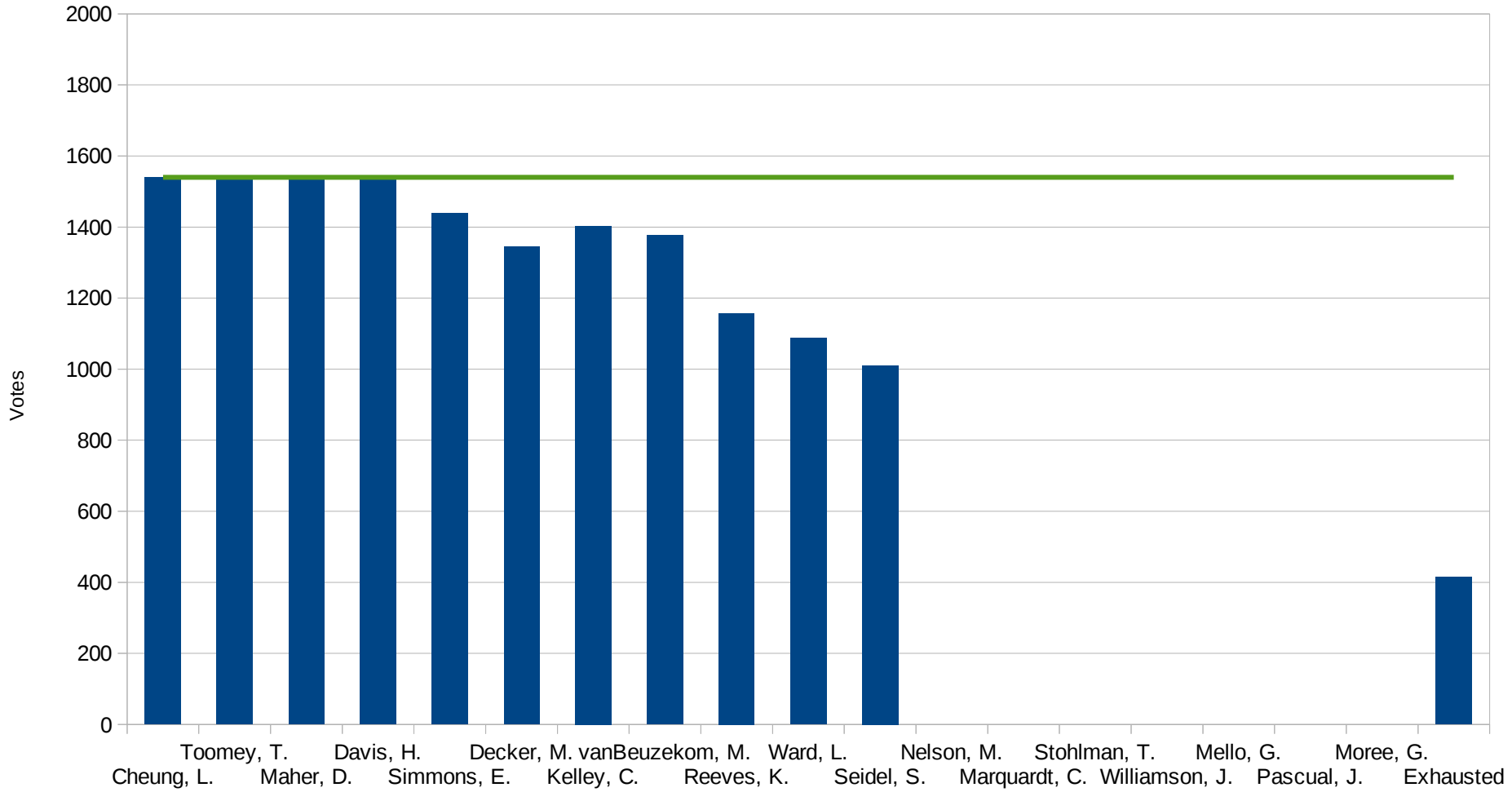

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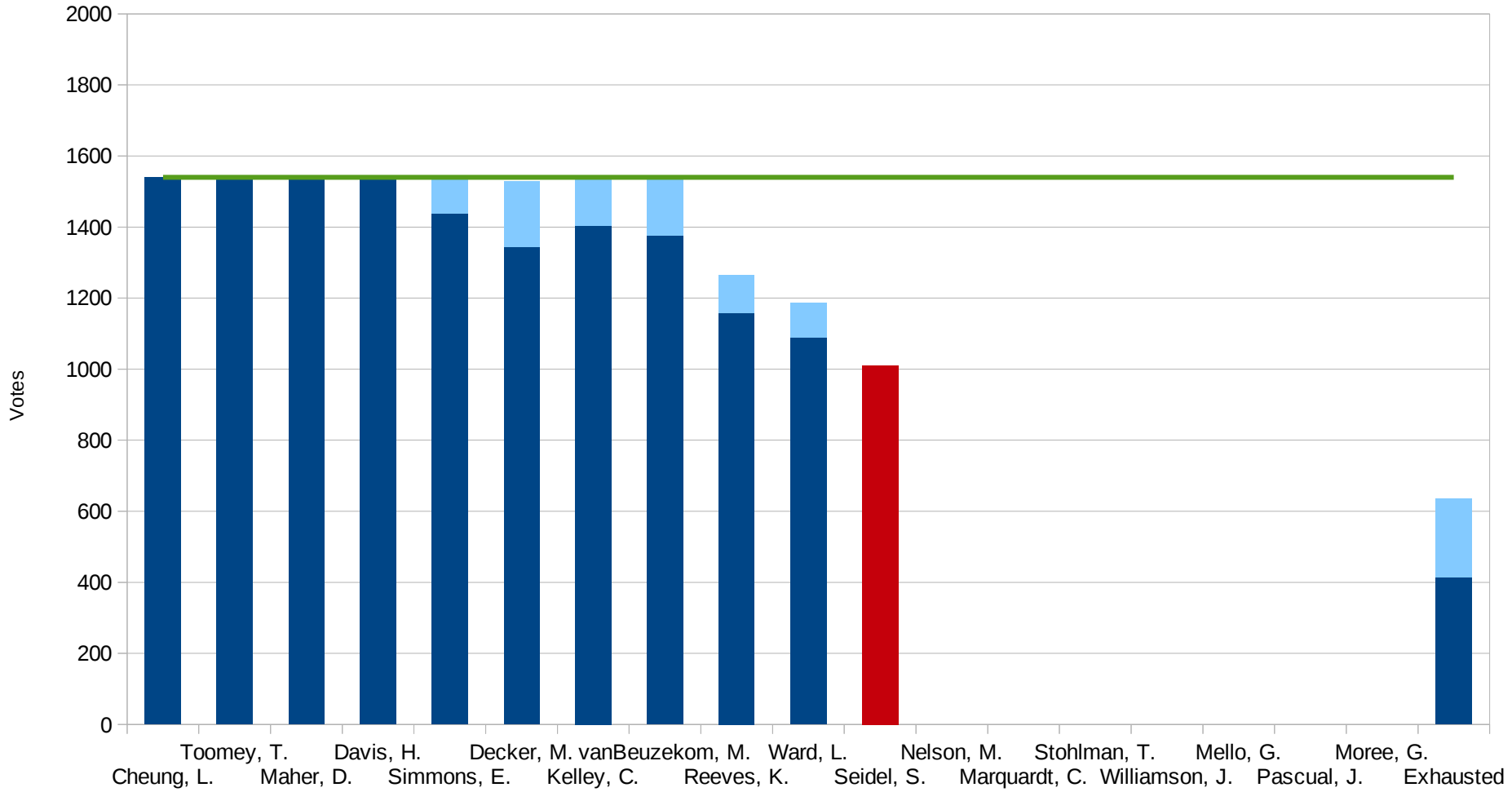

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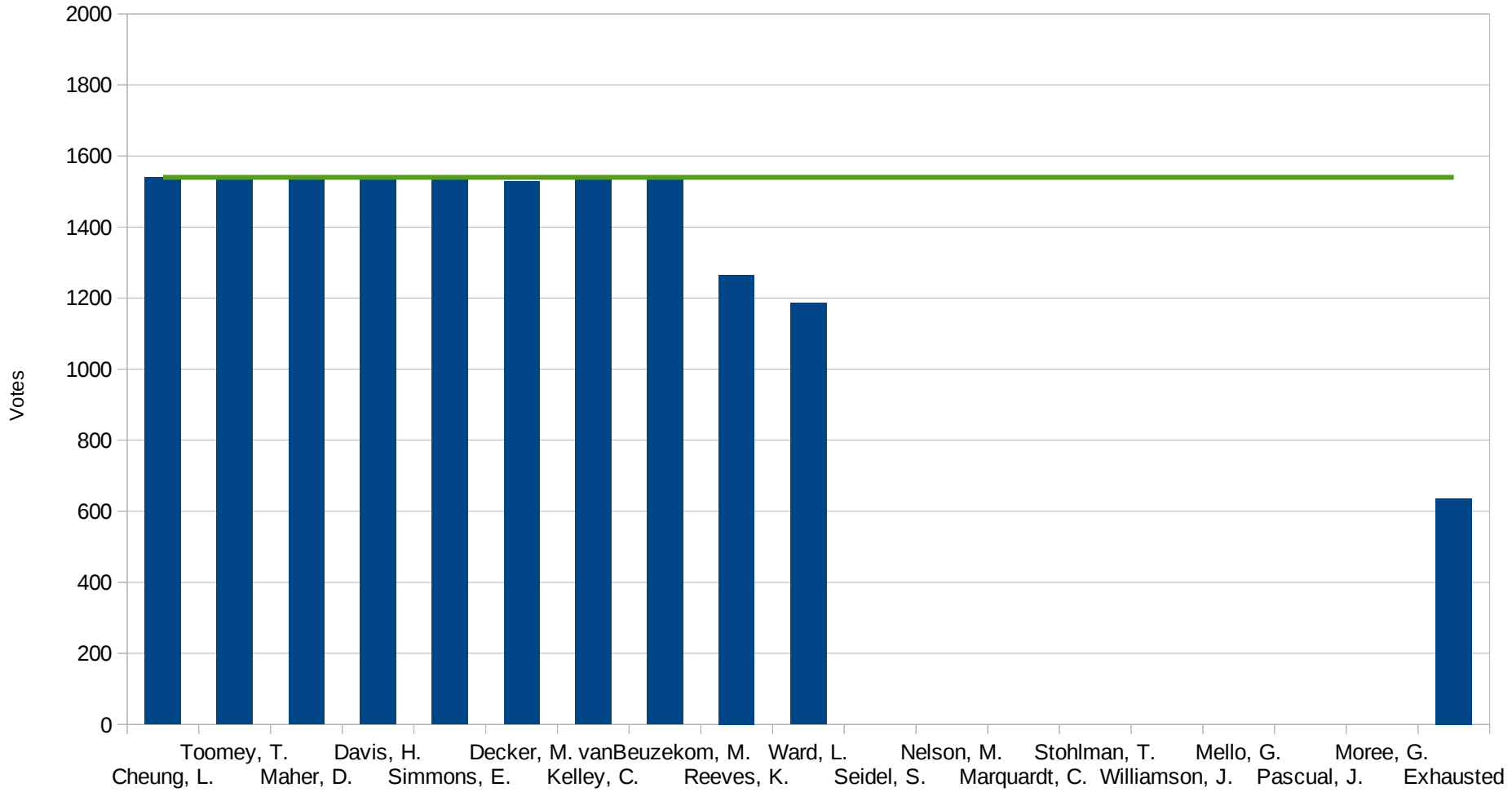

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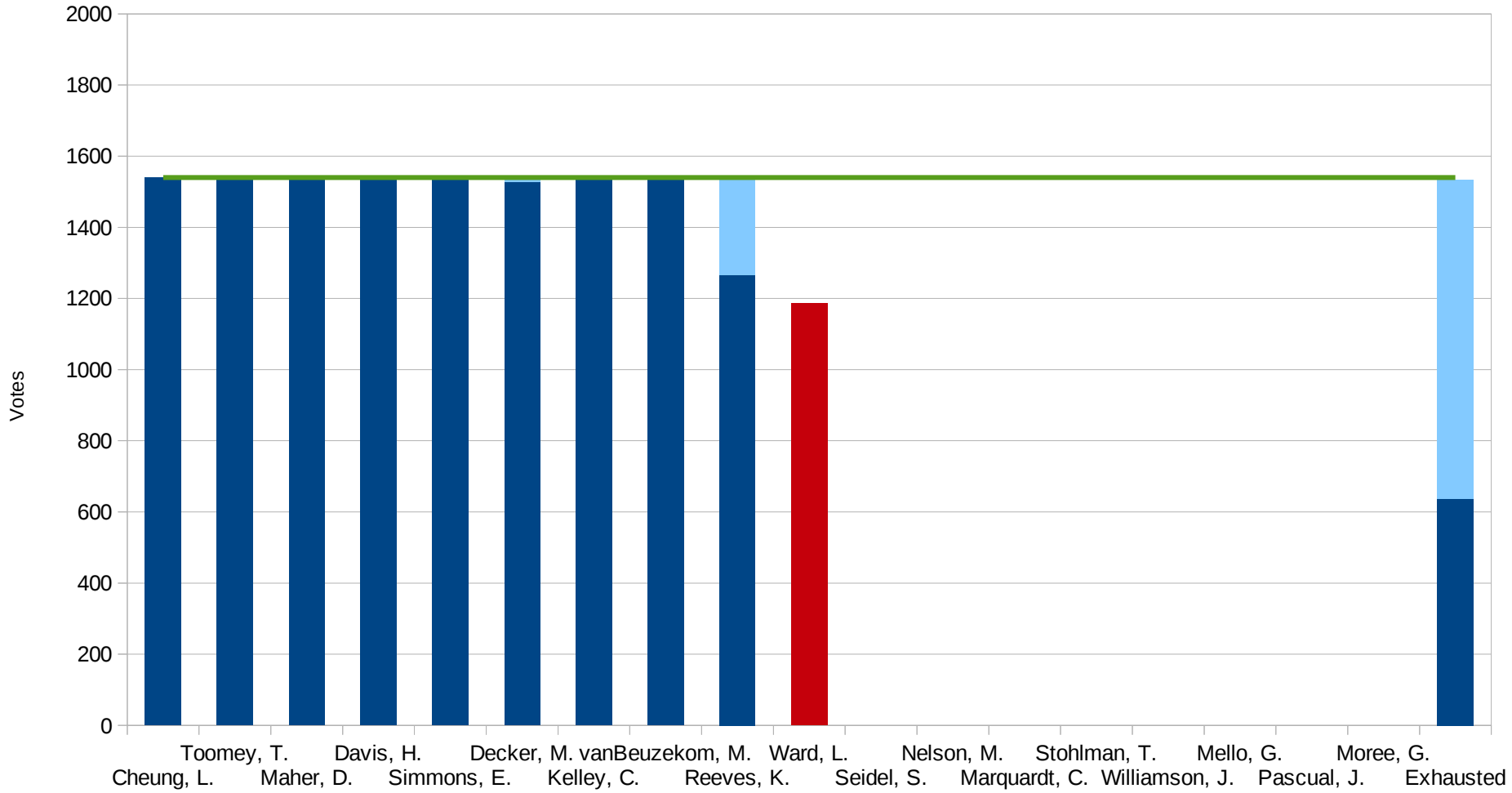

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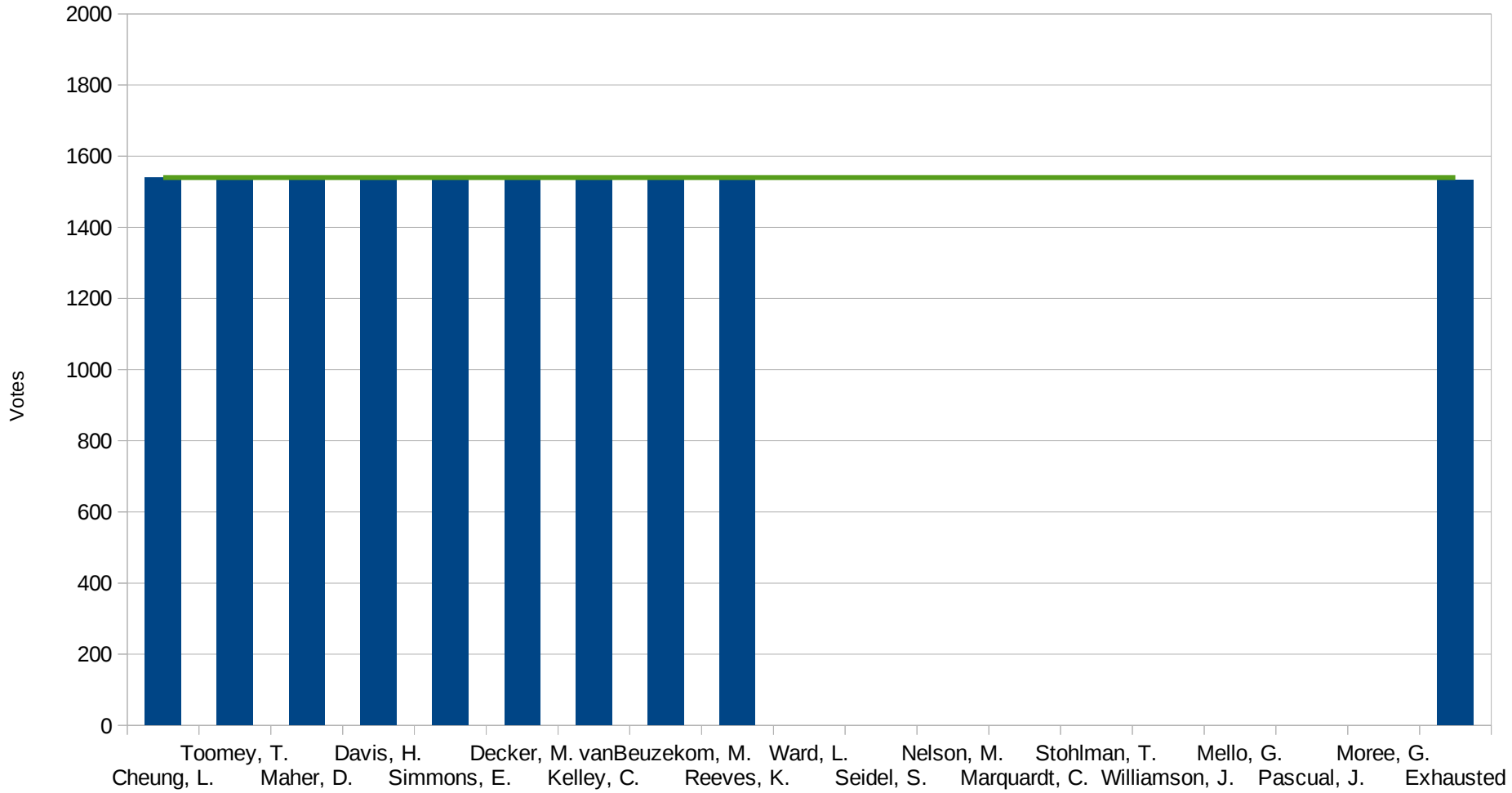

Alternative Vote (**not** proportional)

- Also called Instant Runoff Voting or preferential voting
- Like STV, has a ranked ballot
- Only one seat per district
- Threshold is set to 50%

A primer on voting systems

Questions?

Somes images provided by New Zealand government and Wikipedia users
Altes, Rspeer, Mark Ryan, Dariusofthedark, Jhayman and Earl Andrew.

www.fairvote.ca

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