

THE D'HONDT ELECTORAL SYSTEM

A stated number of representatives are to be elected from a given area. Voters have one vote, for a party or grouping. Members are allocated to these parties one by one, starting by awarding the first member to the party with the largest number of votes. When a party has had one member elected, it enters the next stage of the process credited with half its original vote: this (called its “residual vote”) represents its number of voters per candidate when in contention for a second member. Similarly, after having two members elected, its residual vote is one third of its original vote, and so on. At each stage of the process, the party with the highest residual vote is awarded the next member.

In mathematical notation, if the votes for the respective parties are V_1, V_2, \dots, V_k , the process is equivalent to re-ordering the numbers $\{V_i/n : 1 \leq i \leq k, n \geq 1\}$ as a single sequence in decreasing order.

Simplified example. Suppose there are just two parties A and B , with total vote $V(A)$ and $V(B)$ respectively. Suppose that $V(B)$ is less than $\frac{1}{4}V(A)$ but more than $\frac{1}{5}V(A)$. Then (assuming that at least 5 members are to be elected) the first four will be awarded to A , and the fifth to B .

Actual example: European Parliament election 2014, South East England. Ten members to be elected. They were awarded in the order shown by the bracketed figures, with the new residual vote then shown in the next column to the right. Smaller parties and groups have been omitted.

Con	723,571	(2)	361,786	(4)	241,190	(7)	180,893		
Green	211,706	(8)	105,853						
Lab	342,775	(5)	171,388						
LD	187,876	(9)	93,938						
UKIP	751,439	(1)	375,720	(3)	250,480	(6)	187,860	(10)	150,288

A variation of the system is used for the Scottish Parliament and Welsh Assembly. In a first vote, a number of constituency representatives are elected by simple plurality (so-called “first past the post”). A number of additional representatives for the region are then elected by the d’Hondt system. Voters have a second vote for this purpose; they are free to favour different parties with their two votes. Parties may choose not to contest some of the constituency votes. If a party has (for example) two constituency members elected, it will enter the d’Hondt system credited with one third of its original vote.

Example: Scottish Parliament election 2016, Lothian region. Seven members to be elected in addition to nine constituency members. The first column shows the regional vote for each party, and the second column the number of constituency members elected. The d’Hondt system then starts with the numbers in the third column.

Con	74,972	1C	37,486	(1)	24,991	(4)	18,743	(6)	14,994
Green	34,551	0C	34,551	(2)	17,276	(7)	11,517		
Lab	67,991	1C	33,996	(3)	22,664	(5)	16,998		
LD	18,479	1C	9,240						
SNP	118,546	6C	16,935						