

# Air distribution in street canyons: a CFD study

## Budget

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# 1 Budget

In this part, it will be calculated the cost of this study. The salary of the engineer making the study, the cost of the programs and the energetic cost. First, a table with the cost per hour of each component will be shown:

Cost table	
Aspect	Cost
Engineer salary	13 (EUR/hour)
Energy cost	0.13 (EUR/kWh)

Table 1: Table with the cost per our of each item

The only program used that requires a license is the MatLab. The cost taken is the license for one year. The following, is the budget table, presenting the hours of work, the hours using the computer and the hours at the meetings. There, it must be told that the computer used to make the two dimensional simulations, has been the student's computer, with a energetic cost of  $55Wh/h$ . And the computed used to make the three dimensional simulations has been the teacher's computer, with a estimated energetic cost of  $80Wh/h$ . The use of light and energetic infrastructures are approached as  $20Wh/h$ .

This study has not required the construction of any prototype. So there has not been any material costs for it. The consumable material like a pen or a notebook are neglected.

The table 2 is a itemization of how the hours have been invested in the project.

Itemization	
Aspect	time (hours)
Meetings	48
Literature review	45
Gmsh learning and operation	65
Openfoam learning and operation	130
Paraview learning and operation	85
Results visualization and analysis	125
Final development TFG	189
Total	687

Table 2: Table with the time spend on each part of the project

And the table 3 has the final cost of the study and the hours used to develop it.

Budget table		
Aspect	Time (hours)	Cost (EUR)
Student's work	639	8307
Meetings	48	624
Student's computer simulating	76	0.54
Student's computer working	639	4.57
Teacher's computer simulating	360	3.74
Use of light and infrastructure	687	1.98
MatLab license (one year)	–	800
Total cost	–	9741.83
Total time worked	687	–
Total time spend	1075	–

Table 3: Table showing the cost of each aspect and the total budget of the study

This is the cost of the study and the hours required. It has to be clear that the total of time spend is the sum of the hours worked by the student and the hours that the computers has spend to simulate the cases. However, sometimes it has been possible to make those hours in parallel.