HORIZON 2020

Research Infrastructures

H2020-INFRADEV-2016-1

INDIVIDUAL SUPPORT TO ESFRI AND OTHER WORLD-CLASS RESEARCH INFRASTRUCTURES

IDEAAL

International Development of gAnil-spirAL2

Grant Agreement Number: 730989

D3.3 - Tool for operation costs modeling according to beam time and experiments scenarios

Version: V2
Author: Bertrand FRANEL
Date: 30/09/2020
PROJECT AND DELIVERABLE INFORMATION SHEET

IDEAAL Project Ref. №	730989
Project Title	International DEvelopment of gAnil-spirAL2
Project Web Site	https://ideaal.ganil-spiral2.eu/
Deliverable ID	D3.3
Deliverable Nature	Tool for operation costs modeling
Deliverable Level*	PU- report, CO - computer code & data
Contractual Date of Delivery	30/09/2020
Actual Date of Delivery	30/09/2020
EC Project Officer	Blagovesta CHOLOVA

* The dissemination level are indicated as follows: PU – Public, PP – Restricted to other participants (including the Commission Services), RE – Restricted to a group specified by the consortium (including the Commission Services). CO – Confidential, only for members of the consortium (including the Commission Services).

DOCUMENT CONTROL SHEET

Document	Title: Tool for operation costs modeling according to beam time and experiments scenarios	
	ID: D3.3	
	Version: V2	
	Available at: https://ideaal.ganil-spiral2.eu/	
	Software Tool: Microsoft Office Word 2007	
	File: D3.3_Tool for operation costs modelling according to beam time and experiments scenarios_IDEAAL.pdf	
Authorship	Written by:	Bertrand FRANEL (GANIL)
	Contributors:	
	Reviewed by:	Sabrina LECERF (GANIL)
	Approved by:	Marek LEWITOWICZ (GANIL)

DOCUMENT STATUS SHEET

Version	Date	Status	Comments
V0	03/09/2020	For internal review	
V1	23/09/2020	For internal review	
V2	30/09/2020	Submitted on EC Participant Portal	
		Final version	

DOCUMENT KEYWORDS

Keywords	infrastructure operation cost, cost estimate

Disclaimer

Copyright notices

TABLE OF CONTENTS

List of Figures....4
References and applicable documents....4
List of acronyms and abbreviations....4
Executive Summary....5
Introduction....5
Section 1: Analysis of costs related to GANIL/Spiral 2 installations and development of the cost structure used for the tool....5
Section 2: The development of the tool for costs of the experiments on Excel spreadsheets....5
Conclusion:....8

LIST OF FIGURES

Figure 1. Application start menu

Figure 2. Schematic layout of the facility including accelerators and experimental setups of GANIL cyclotrons (upper part) and SPIRAL2 (lower part)

Figure 3. Display of the result of a calculation (example)

REFERENCES AND APPLICABLE DOCUMENTS

[1]

LIST OF ACRONYMS AND ABBREVIATIONS

UT	Unit of Time (8 hours)

EXECUTIVE SUMMARY

INTRODUCTION

This task aims at providing a tool in order to valuate the cost of experiments according to different parameters :the type of beam provided and the time of the experiment.

This tool will serve to inform the user of the cost of an experiment and will allow GANIL to negotiate the conditions of partnerships within the framework of the internationalisation of the laboratory. This task is strongly linked with the workpackage 2 « International coordination and new partners ».

SECTION 1: ANALYSIS OF COSTS RELATED TO GANIL/SPIRAL 2 INSTALLATIONS AND DEVELOPMENT OF THE COST STRUCTURE USED FOR THE TOOL.

3 different kind of costs have been identified in GANIL accounts:

- Running costs: Costs which are necessary to run of the facility and directly linked to the conduct of experiments (fluids, curative maintenance…)
- Maintaining in Operational Conditions (MCO) costs: Costs necessary for running the facility not directly connected to an experiment (maintenance expenditures, cooling….)
- Support costs: Infrastructure costs of the site that hosts the experiments (Missions, taxes, guarding, building maintenance…)

SECTION 2: THE DEVELOPMENT OF THE TOOL FOR COSTS OF THE EXPERIMENTS ON EXCEL SPREADSHEETS

The tool has been created with Excel spreadsheet, with the permanent concern to keep it easy for the user. A guide for the administrator of the tool has also been implemented to allow updating of the figures.

2.1 Start menu

When opening the application, a menu shows up to guide the user (Fig. 1).

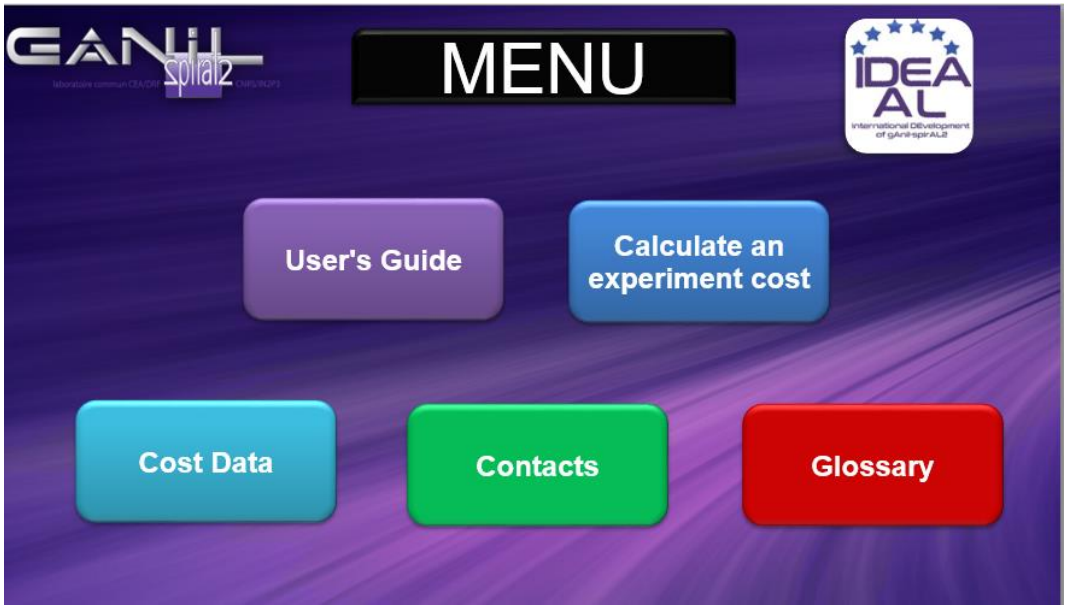

Figure 1. Application start menu.

The user's guide button directly gives access to the instructions allowing to calculate the cost of an experiment, to select the required settings and to put necessary input data and parameters in the tool, namely:

- Number of UT/year of activities (base = 600)
- Option to include personnel costs
- Duration of the experiment
- Equipment used to provide the beam up to the target in the experimental room.

To calculate the cost of an experiment, a schematic layout of the facility separately for the GANIL cyclotrons with the corresponding experimental area and for SPIRAL2 hereunder (Fig. 2) helps in putting in the settings mentioned above.

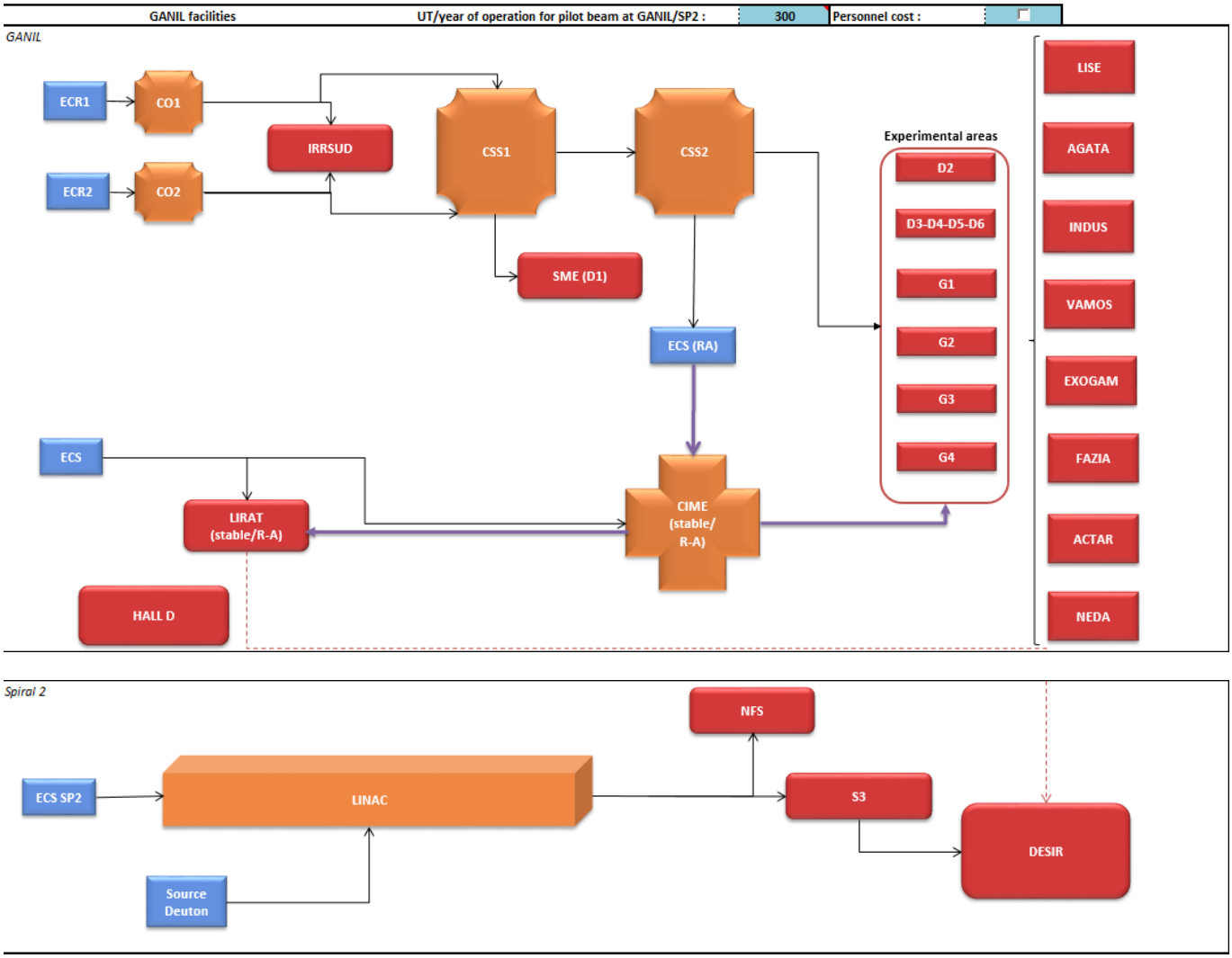

Figure 2. Schematic layout of the facility including accelerators and experimental setups of GANIL cyclotrons (upper part) and SPIRAL2 (lower part)

The button « Cost data » gives access to the data base.

Finally, the buttons « contact » and « glossary » can help in case of questions about the tool itself.

2.2 Results of the cost calculation

The display of the result of a calculation has the following form (Fig. 3) :

Types of costs	Label	Acceleration	Areas	Instruments	AGATA	VAMOS	TOTAL GANIL	TOTAL GIE	Average cost for 1 UT	Average cost for 1 hour
Running cost	*Electricity (Experimental instruments)*	99 705,00 €	5 865,00 €	2 111,40 €	938,40 €	1 173,00 €	107 681,40 €	107 681,40 €	3 589,38 €	448,67 €
	Liquid nitrogen	€	€	1 430,95 €	1 430,95 €	€	1 430,95 €	1 430,95 €	47,70 €	5,96 €
	Liquid helium	€	€	€	€	€	€	€	€	€
	Water (Experimental instruments)	4 686,70 €	206,01 €	92,70 €	41,20 €	51,50 €	4 985,41 €	4 985,41 €	166,18 €	20,77 €
	Curative maintenance	19 656,00 €	1 764,71 €	14 889,71 €	7 444,85 €	7 444,85 €	36 310,41 €	36 310,41 €	1 210,35 €	151,29 €
	Consumables	7 941,18 €	4 411,76 €	18 529,41 €	9 264,71 €	9 264,71 €	30 882,35 €	30 882,35 €	1 029,41 €	128,68 €
	Personnel	€	€	€	€	€	€	€	€	€
TOTAL Running cost		131 988,87 €	12 247,48 €	37 054,17 €	19 120,11 €	17 934,06 €	181 290,52 €	181 290,52 €	6 043,02 €	755,38 €
Maintainance in operational condition costs	*Electricity (Experiment's buildings)*	14 072,94 €	7 818,30 €	2 606,10 €	1 303,05 €	1 303,05 €	24 497,34 €	24 497,34 €	816,58 €	102,07 €
	Safety & security & environment	6 187,50 €	4 375,00 €	1 250,00 €	625,00 €	625,00 €	11 812,50 €	11 812,50 €	393,75 €	49,22 €
	Maintenance	10 080,00 €	5 600,00 €	4 125,00 €	2 062,50 €	2 062,50 €	19 805,00 €	19 805,00 €	660,17 €	82,52 €
	Electrical distribution	7 964,46 €	957,83 €	330,23 €	156,90 €	173,32 €	9 252,51 €	9 252,51 €	308,42 €	38,55 €
	Radioactive waste	1 633,50 €	1 155,00 €	770,00 €	192,50 €	577,50 €	3 558,50 €	3 558,50 €	118,62 €	14,83 €
	Design / manufacture	1 608,75 €	1 137,50 €	325,00 €	162,50 €	162,50 €	3 071,25 €	3 071,25 €	102,38 €	12,80 €
	Personnel	€	€	€	€	€	€	€	€	€
TOTAL MCO cost		41 547,15 €	21 043,63 €	9 406,33 €	4 502,45 €	4 903,87 €	71 997,10 €	71 997,10 €	2 399,90 €	299,99 €
Support costs	*Water (Administrative buidling)*	685,13 €	131,44 €	183,43 €	93,26 €	90,17 €	1 000,00 €	1 000,00 €	33,33 €	4,17 €
	Electricity (Administrative building)	€	€	€	€	€	€	€	€	€
	Gas	4 307,16 €	826,29 €	1 153,15 €	586,31 €	566,84 €	6 286,60 €	6 286,60 €	209,55 €	26,19 €
	Computers & software	8 778,28 €	1 684,02 €	2 350,19 €	1 194,94 €	1 155,25 €	12 812,50 €	12 812,50 €	427,08 €	53,39 €
	Missions	14 045,25 €	2 694,44 €	3 760,31 €	1 911,91 €	1 848,40 €	20 500,00 €	20 500,00 €	683,33 €	85,42 €
	Telephony	1 825,88 €	350,28 €	488,84 €	248,55 €	240,29 €	2 665,00 €	2 665,00 €	88,83 €	11,10 €
	Vehicle fleet	526,70 €	101,04 €	141,01 €	71,70 €	69,32 €	768,75 €	768,75 €	25,63 €	3,20 €
	Insurance, taxes, duties	1 861,00 €	357,01 €	498,24 €	253,33 €	244,91 €	2 716,25 €	2 716,25 €	90,54 €	11,32 €
	Guarding	10 885,07 €	2 088,19 €	2 914,24 €	1 481,73 €	1 432,51 €	15 887,50 €	15 887,50 €	529,58 €	66,20 €
	Health department	1 228,96 €	235,76 €	329,03 €	167,29 €	161,74 €	1 793,75 €	1 793,75 €	59,79 €	7,47 €
	Library	1 755,66 €	336,80 €	470,04 €	238,99 €	231,05 €	2 562,50 €	2 562,50 €	85,42 €	10,68 €
	Wastes	1 228,96 €	235,76 €	329,03 €	167,29 €	161,74 €	1 793,75 €	1 793,75 €	59,79 €	7,47 €
	Common means of management	26 334,85 €	5 052,07 €	7 050,58 €	3 584,83 €	3 465,76 €	38 437,50 €	38 437,50 €	1 281,25 €	160,16 €
	Scientific animation	4 389,14 €	842,01 €	1 175,10 €	597,47 €	577,63 €	6 406,25 €	6 406,25 €	213,54 €	26,69 €
	Hydraulic networks, heating, air conditioning	5 091,40 €	976,73 €	1 363,11 €	693,07 €	670,05 €	7 431,25 €	7 431,25 €	247,71 €	30,96 €
	Building and outdoors	7 198,19 €	1 380,90 €	1 927,16 €	979,85 €	947,31 €	10 506,25 €	10 506,25 €	350,21 €	43,78 €
	Cleaning	6 408,15 €	1 229,34 €	1 715,64 €	872,31 €	843,33 €	9 353,13 €	9 353,13 €	311,77 €	38,97 €
	Copy machines	1 018,28 €	195,35 €	272,62 €	138,61 €	134,01 €	1 486,25 €	1 486,25 €	49,54 €	6,19 €
	Personnel	€	€	€	€	€	€	€	€	€
TOTAL Support cost		97 568,06 €	18 717,44 €	26 121,73 €	13 281,43 €	12 840,29 €	142 407,23 €	142 407,23 €	4 746,91 €	593,36 €
TOTAL		271 104,08 €	52 008,55 €	72 582,22 €	36 903,99 €	35 678,23 €	395 694,85 €	395 694,85 €	13 189,83 €	1 648,73 €

Figure 3. Display of the result of calculation (example)

The parameters selected for this exemple are : 30 UT in G1 experimental hall, using AGATA&VAMOS detectors (1 UT last 8 hours of beamtime). No staff cost included.

CONCLUSION:

The tool is fully operational and easy to use. It is stored on the GANIL internal server.

An additional development is in progress to put this tool on a web- interface to facilitate its access for the users. Soon It will be possible for experimenters to rapidly estimates the cost of experiments that they are going to perform.