Success Stories and Economic Impact of Materials Modelling

Fields marked with * are mandatory.

1 Introduction

You are invited to provide input to a study by the European Materials Modelling Council (EMMC) into the economic impact of materials modelling. Please also see the official invitation letter from Clara de la Torre, Director of the Directorate-General for Research & Innovation of the European Commission.

While there is plenty of qualitative evidence, there are few impact examples with quantitative information. The last quantified ROI (Return on Investment) study was conducted by IDC more than 10 years ago (M. Swenson, M. Languell, and J. Golden, "Modeling and Simulation: The Return on Investment in Materials Science," IDC, Jun. 2004).

We are interested in projects that led to an innovation, a product improvement or a new product and that involved materials modelling at some stage. The current survey asks for some qualitative information about the project, the innovation and benefits of materials modelling as well as some quantitative information about the ROI of the project as a whole.

There may be questions for which you do not have or cannot share information, but it will still be valuable if you complete as much of the survey as possible anyway.

For reference, you may be interested in an IDC survey on the ROI of High Performance Computing.

The aims of our study are:
- To compile success stories and case examples involving materials modelling in academia and industry.
- To improve the understanding of the benefits of using materials modelling.
- To help quantify the impact of materials modelling.
- To support decisions by public bodies and private organisations.

We are interested in current cases as well as examples dating back as far as 12 years. There is provision in the survey for just one case. For further cases, please either let us know via the questions at the end of the survey or run the survey again (you will need to clear your browser cache or use a different browser for that).

Your support and participation in the survey is very much appreciated!

2 Confidentiality

2.1 *We will treat your personal information as confidential. Regarding the project information you provide, please indicate whether you require that information to be kept confidential.

   ○ I approve the public use of all the project and impact information I provided including the organisation name.

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   ○ I approve only averages and summaries to be used.

2.2 If you have any additional comments or requests regarding confidentiality, please use the box below.

3 Background Information

3.1 *Surname

3.2 First (given) name(s)

3.3 Job title or role

3.4 *Company/Organisation

3.5 *Email

3.6 Phone

3.7 What is the number of employees at your organisation? In case of universities, please state the number of employees in your department.
- ○ Less than 50
- ○ 50 to 249
- ○ 250 to 999
- ○ 1000 to 10,000
- ○ More than 10,000

3.8 What is the approximate annual revenue of your organisation? In the case of universities, please state the annual budget of your department.
- ○ Less than €5m
- ○ Between €5m and €25m
- ○ Between €25m and €100m
- ○ Between €100m and €1bn
- ○ More than € 1bn

4 Information about the materials modelling project/innovation

4.1 Please describe the project and its outcome in general.

4.2 During what time was the project carried out? Please provide start and end year (e.g. 2012-2013).

4.3 Please describe the role played by materials modelling.

4.4 In which country was the materials modelling part of the project carried out?

4.5 Which types of model were used in the project. Please tick all that apply. For definition of the types of model, please see the Review of Materials Modelling.

- ☐ Electronic
- ☐ Atomistic
- ☐ Mesoscopic
- ☐ Continuum - microstructure of materials
- ☐ Continuum - process, device, product
- ☐ Thermodynamics
- ☐ Process modelling
- ☐ Other

4.6 For Other, please describe the type of model by the physics/chemistry equations solved.

4.7 Which length scales were probed with the modelling? (Click all that apply)

- ☐ Nanoscale (< 100 nm)
- ☐ Microscale (100 nm - 1 mm)
- ☐ Macroscale (> 1mm)

5 Impact

5.1 Please describe the innovation resulting from the project and the impact it created.

5.2 Which key task was materials modelling used for in this project?
- ☐ Determine data on materials properties
- ☐ Gain insights into behaviour of materials and underlying physics/chemistry
- ☐ Other

5.3 For 'Other' and further information, please use the box below.

5.4 Materials modelling has been associated with a range of benefits for the R&D process. Please select the ones that apply in your case.
- ☐ More efficient and targeted experimentation
- ☐ Avoiding potentially hazardous experimentation
- ☐ Broader exploration
- ☐ Deeper understanding
- ☐ Other

5.5 If 'Other', please specify below.

5.6 Please select the types of impact created by the materials modelling project.
- ☐ Innovation accomplished
- ☐ Revenue increased
- ☐ Costs saved
- ☐ Jobs created

5.7 What is the **total** (actual or expected) value of financial returns?

EURO

5.8 What is the actual or expected revenue generated from this project or innovation?

EURO

5.9 What is the actual or expected cost saving from this project?

EURO

5.10 How many new full-time equivalent jobs were or are expected to be created as a result of this project?

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6 Investment

Please specify the investment that went into the project, including people, equipment, software, and overheads for buildings, power etc. Rounded or even order of magnitude figures are sufficient. If you can just supply some of the figures that is also valuable!

6.1 Total R&D project investment.

<div style="border:1px solid #888; width:430px; height:60px; display:inline-block;"></div> Euros

6.2 Total investment in materials modelling for the project.

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6.3 Materials modelling staff cost for the project.

<div style="border:1px solid #888; width:430px; height:60px; display:inline-block;"></div> Euros

6.4 Materials modelling software cost for the project.

<div style="border:1px solid #888; width:430px; height:60px; display:inline-block;"></div> Euros

6.5 Computing hardware cost for the project.

<div style="border:1px solid #888; width:430px; height:60px; display:inline-block;"></div> Euros

6.6 Please provide any further comments in the box below, e.g. whether the figures above are actual or project figures, and what roughly the error margin of the figures is.

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7 Further information

7.1 Can you contribute further ROI and/or innovation case examples?

- ○ Yes
- ○ No

7.2 If yes, we would be grateful if you could either

- Run the survey again (you will need to clear your browser cache or use a different browser for that), or

- Provide the information in the box below.

7.3 Please indicate whether we may contact you for further discussion and questions (e.g. about improvements to be made to the existing materials models)?

- ○ Yes
- ○ No

Many thanks for taking part in the survey!