

The use of analytical research infrastructures to support industrial innovation

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1. Introduction

Analytical Research Infrastructures (ARIs, among which synchrotrons sources like the ESRF), may contribute and already contribute to industrial innovation, supporting R&D and QA activities of SMEs and LCs. They are definitely supporting industry in new material development and in the optimisation of processes and products. This is indeed part of their mission and they have dedicated resources for this. Furthermore, they are often active at the core of dedicated ecosystems (like the one of Grenoble). This can allow them to make available a know-how that can go far beyond the simple deployment of our instrumentation.

2. Analytical Research Infrastructures supporting accelerated discovery of new materials

Today, these large scale research infrastructures, are organised in the framework of ARIE (Analytical Research Infrastructures of Europe (www.arie.eu)). If we think about the opportunities related with the deployment of these ARIs there is a quite low hanging fruit to be harvested. This is represented by the deployment of streamlined routine services capable to run high throughput standardised experiments, where large lots of similar samples need to be characterised in an automatic fashion. These novel routine services need new pipelines to be consolidated going from the data acquisition, to the data reduction, to the data analysis. These systems will be capable to produce huge datasets capable to feed AIs in a feedback loop between sample production, characterisation and modelling with the results to accelerate the discovery of new material and a more rational design of new products (see fig.1).

3. Overcoming the barriers to entry

Unfortunately, today, when one thinks about ARIs supporting industry, often only considers their contribution to the scientific excellence pillar, where a lot can be done, for sure, in collaboration with industry, in the pre-competitive phase of the product development. Nonetheless, it already exists a proof of evidence that, by considering ARIs as potential business partners for industrial projects at higher TRL/MRL, could result in an incredible acceleration in material discovery and new product design. Nonetheless, in order to happens, this would need external stimulation, because this activity falls somehow beyond the core business of these facilities and industry would be a fast

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follower indeed, but would not take the initiative, due to a perceived lack of specific competences.

4. A core business for Pillar II

Some of the tools made available in pillar II demonstrated very effective in the definition and the deployment of these new services. In particular, in the context of the calls supporting characterisation, the projects EASI-STRESS, NanoMECommons and AddMorePower, demonstrated the viability of this concept. New services have been developed exploiting the unique capabilities available at the European Synchrotron (ESRF), always in compliance with the data exploitation frameworks developed by the European Material Characterisation Council (EMCC) and Modeling Council (EMMC).



Figure 1 Contribution of ARI to the New Product Development]

5. Conclusions

In conclusion, there is a strong evidence that whatever strategy would be defined to support advanced material based industrial innovation, it would receive enormous benefits if these considerations will be taken on-board.