POLICY BRIEF: Increasing Data Analytics Knowledge to Improve the Uptake of Recycled Plastic Material in Production Processes

Executive Summary:

The successful adoption of recycled plastic material in plastic production processes requires the use of digital tools and data analytics. However, employees often lack the necessary background to understand how data science can support them in their decision-making. This policy brief argues for the need to provide training for employees in the plastics industry on data analytics and its potential benefits, but also its limitations. The brief suggests that this training should be embedded in education programs and provided as on-the-job training to ensure that employees have the necessary skills and knowledge to make informed decisions about the use of recycled plastic material, leading to increased efficiency, reduced waste, and improved sustainability.

Introduction:

The use of recycled plastic material in production processes is critical for sustainable development, which is why it is necessary to increase the uptake of recycled plastic material in production processes across the plastics industry. Digital tools can play an important role in supporting this goal. Being data-driven helps making more informed and efficient decisions, e.g. due to better insights into the process parameters and material quality and needs through reports. However, employees often lack the necessary skills and knowledge to effectively use data analytics tools to make informed decisions. In the pilot phase of the Interreg NWE funded project "Di-Plast – Digital Circular Economy for the Plastics Industry", we found in working with different companies that data was either not available, was poorly collected, and that data sources were not aligned. Hence, we found that many companies have not yet started with correctly measuring their processes in the first place. So, the higher-level data science solutions seem to be too farfetched, since the plastics sector is still in the early stages of becoming truly data-driven.

Problem Statement:

The lack of data analytics knowledge among employees can limit the effective use of digital tools to support the adoption of recycled plastic material in production processes. This can lead to missed opportunities to reduce waste, increase efficiency, and improve sustainability. Without adequate training and support, employees may not understand how to use data analytics to identify

opportunities for using recycled material, monitor progress, and make informed decisions. In alignment with our above-mentioned problem experience some companies from the plastics industry are still in the stage of data collection stage, as it is named in the Smart Circular Economy Framework of Kristoffersen et al (see Figure 1). In this stage, companies need collect data from connected resources in order to be able to describe what happened to e.g. their material in the production process. The different stages in terms of data flow processes need to be mastered one after the other in order to evolve towards the Knowledge and Wisdom stages. Hence, companies need to move from the data collection phase towards the data integration and then the data analysis phase.
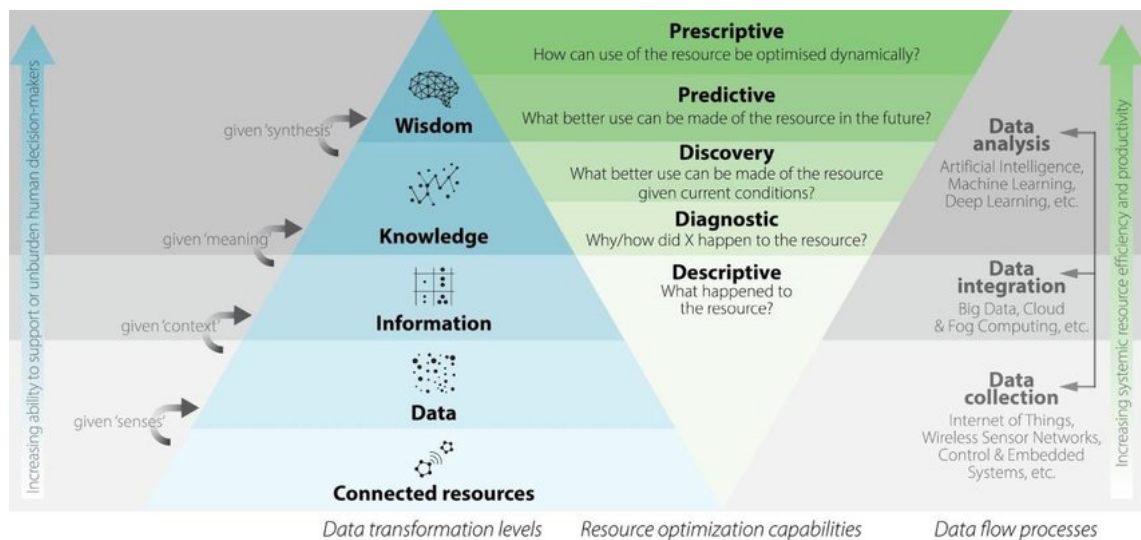

Figure 1 The Smart Circular Economy Framework
Source: Kristoffersen, E., Blomsma, F., Mikalef, P., & Li, J. (2020a). The smart circular economy: Adigital-enabled circular strategies framework for manufacturing companies. Journal ofBusiness Research, 120, 241-261

Recommendations:

To address this problem, it is necessary for training of employees to ensure that the right problems are targeted, so that companies can move up the different stages without pursuing unfeasible goals in terms of data science or missing out on data opportunities due to a lack of knowhow. This ultimately will lead to bringing companies up the ladder of strategic decision making and increase the systemic resource efficiency and productivity (as indicated in the smart circular economy framework by Kristoffersen et al, see Figure 1).

This development can be supported through policy makers and company decisions in several aspects. To increase data analytics knowledge among employees and support the uptake of recycled plastic material in production processes, the following recommendations are proposed:

- Embed data analytics training in education programs:
  - Schools and universities should provide education programs that include data analytics training to equip future employees with the necessary skills and knowledge.
- Provide on-the-job training:
  - Companies should provide on-the-job training to their employees to ensure they have the necessary skills and knowledge to effectively use data analytics tools to support the adoption of recycled plastic material in production processes.
  - Through this, a scientific approach should be taught in which companies learn how to develop adequate and meaningful experiments and experiment settings. This is especially important since data science approaches mainly consist of data gathering and cleaning, and insufficient data quality and preparation hinders data analytics.
- Create incentives:
  - Companies should create incentives to encourage employees to adopt data analytics tools and use them to support the adoption of recycled plastic material in production processes.

Policy makers across north-west Europe are invited to back decisions that support the installation of the above-mentioned recommendations. Companies and associations are invited to not wait for policy support but start investing into these options.

Conclusion:

Increasing data analytics knowledge among employees is critical to support the uptake of recycled plastic material in production processes within the plastics industry leading to increased efficiency, reduced waste, and improved sustainability in the plastics industry. By embedding data analytics training in education programs and providing on-the-job training, companies can ensure that their employees have the necessary skills and knowledge to make informed decisions and focus on the right goals. Policy makes can encourage and support these necessary changes through the above-mentioned recommended activities.