Introduction to Panel 2 Sustainable production design and supply chain initiatives

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Note: this summary includes the presentation made at the final plenary by the panel leaders (attached)

Industrial sustainability and circular economy have gained increased relevance in the policy-making agenda. Energy efficiency, within the broader field of resource efficiency, surely represents one effective means towards increased industrial sustainability. When dealing with manufacturing companies, as known, energy efficiency is strictly connected to the management and improvement of energy resources, from local and distributed generation to final use, offering energy and additional benefits, thus leading to a more sustainable production.

Nevertheless, on the one hand investing in energy efficiency represents a complex decision-making process that needs to be thoroughly understood by both final users and external stakeholders. On the other hand, energy efficiency measures represent a wide set of actions that not only include the adoption of innovative technologies, but also require changes in the behaviour of operators for a more sustainable production. Therefore, a deeper understanding of the strong set of those relationships is crucial in order to tackle existing barriers and make leverage on the most important drivers to promote the adoption of best energy efficiency measures and practices.

A boost towards energy efficiency can be done at various levels: through actions specifically devoted for final users, but also with a deeper coordination of the stakeholders involved in the supply chain of energy efficiency solutions, and through a creation of specific networks in which the exchange of experiences and knowledge should be fostered. In doing so, further considerations on the implications of the overall sustainability of companies and implications for their business are crucial.

This panel aims at offering a contribution in the debate over the aforementioned issues through a unique blend of theoretical and empirical studies, with contributions from industry, academia and policy-making institutions, organized into five main sub-streams as follows: *i) investing in energy efficiency; ii) benefits of energy efficiency; iii) innovation for energy efficiency; iv) network and supply chain for energy efficiency; and v) energy efficiency and heat.*

Investing in energy efficiency

The discussion over the issues when investing in energy efficiency will take benefits by the presentation from Brunsting et al. (extended abstract 2-027-16) who have analysed the decision-making process of energy efficient investments, focusing on the process industry, as well as from the new empirical insights from Swedish pulp and paper industry offered by Rasmussen (extended abstract 2-028-16). The contribution by Neri et al. (paper 2-046-16) will complement this view by showing the relevance of properly make such decision-making on energy efficiency measures within the broader context of company sustainability. Moreover, the panel will look at the current and future business potential of one very promising energy efficiency technology such as biogas, with empirical evidence from Ottosson et al. (paper 2-007-16) in the Nordic forest industry.

Benefits of energy efficiency

This sub-stream will show a broad set of benefits from implementation of actions aimed at improved energy efficiency. In particular, Mattes et al. (paper 2-080-16) will show benchmarking activities for German non-energy intensive industries, while Cosgrove et al. (paper 2-034-16) will present a methodology for

effectively measure energy savings obtained through changes in operational behaviour, and Parra et al. (paper 2-094-16) will offer a zoom on barriers, drivers and non-energy benefits when making energy efficiency in compressed air systems. For a deeper comprehension of the benefits stemming from energy efficiency, Cagno et al. (paper 2-086-16) will show through cases from industry the several set of impacts (either positive and negative) when implementing and operating an energy efficiency measure.

Innovation for energy efficiency

In this sub-stream the panel will present several approaches for bringing innovation aimed at energy and resource efficiency. Riviere-Kaluc & Streiff (extended abstract 2-095-16) and Loperte et al. (extended abstract 2-058-16) will discuss initiatives and partnerships for improved innovation at domestic and local level, offering insights from France and southern Italy, respectively. Regarding more specific energy efficient and resource efficient production, a specific focus has been given for 3D printing technology. Liu and Evans (paper 2-104-16) will show how SMEs respond to the emergence of 3D printing technology, and to identify the factors for implementation of this technology by SMEs. Additionally, Hettesheimer et al. (paper 2-084-16) will showcase the impact of additive manufacturing process, taking the example of selective laser-sintering, focusing on automotive and aircraft industries.

Network and supply chain for energy efficiency

This sub-stream will present broad evidence from industry, academia and policy-making institutions on the emerging networking approaches for improved experience and knowledge aimed at increasing energy efficiency. In particular, Horvath et al. (extended abstract 2-059-16) will discuss the relevance of improving the involvement of supply chain stakeholders to boost the supply and demand of highest energy efficiency products, showing the evidence of a project focused on refrigerators and freezers. Moreover, Frisk et al. (extended abstract 2-049-16) will present the case of a network for the Swedish aluminium industry, while Espert et al. (paper 2-144-16) will sketch the structured dialogue process with stakeholders from companies and industrial associations in Germany, so to improve the engagement of energy intensive industries in ambitious climate policies at regional level. Xylia et al. (paper 2-151-16) will offer a contribution in discussing the relevance of a more resource efficient steel production worldwide and Kermeli et al. (paper 2-033-16) will show key factors for further improvement regarding the cement industry. Extending the view over the whole supply chain is crucial to fully consider the relevance of energy efficiency, as shown by Rootzen & Johnsson (extended abstract 2-137-16) for the supply chain of basic materials, as well as by Reisinger (extended abstract 2-162-16) highlighting the importance of life cycle energy labels able to include the energy usage through the whole production stages, including supply chain and transportation. Finally, Sommarin et al. (extended abstract 2-129-16) will offer their empirical contribution in showcasing the opportunity to effectively have a circular economy, despite the existing difficulties, with an example in the Swedish food industry.

Energy efficiency and heat

The relevance of heat in industrial process is widely known, as well as its relevance for a more sustainable production. Nevertheless, the discussion over the opportunities to save, re-use or exchange excess heat within a company is too little. In this regard, Cornelis & Van Bael (paper 2-017-16) will focus on how to estimate the potential of excess heat, with several methods applied in many companies in Belgium. Mueller & Greenough (paper 2-014-16) will present a methodology for the integration of solar process heating in the food industry. Aydemir et al. (paper 2-072-16) will discuss how spatial data mining can be used to analyse industrial symbiosis potentials, showcasing the tapping potential of energy savings thanks to inter-company heat exchange and integration.


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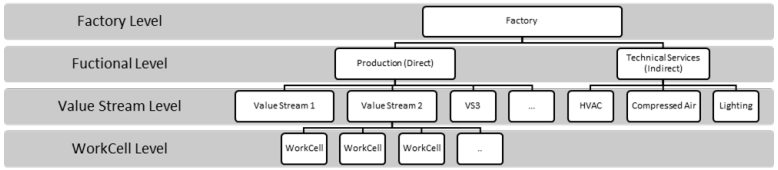
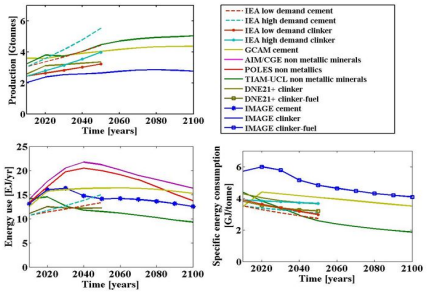
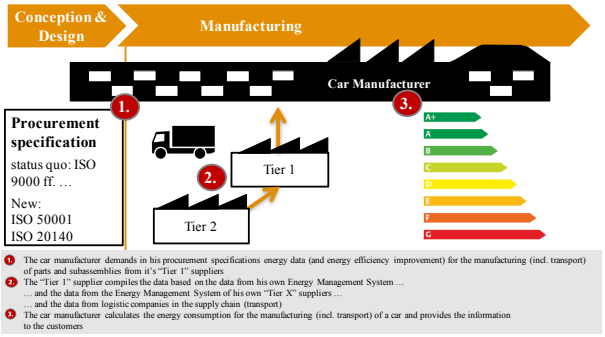
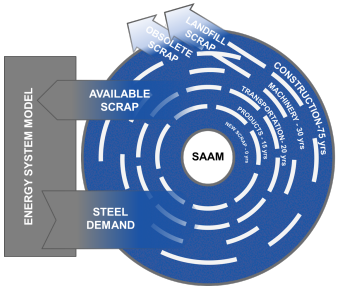
Panel 2: Sustainable production design and supply chain initiatives

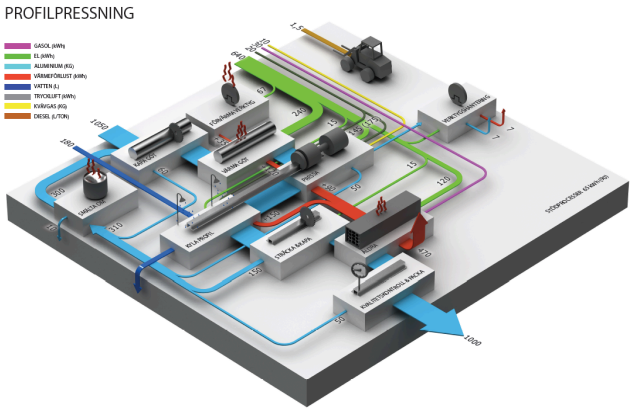
1. Investing
2. Benefits
3. Innovation
4. Supply chain
5. Network
6. Heat











… for Energy Efficiency!

Key messages

For improved energy efficiency …

1. We need to better understand **all different perspectives** within a company (decision-makers, interests, barriers…)

2. We need to **place energy efficiency under industrial sustainability analysis**: more and better solutions by looking at a broader context in long-term perspective

3. We can find even **more effective opportunities when extending the view** from a single company to a broader supply chains and/or network