

*Joint Programme
"Energy Efficiency in Industrial Processes (EEIP)"*

Input by EERA on Set Plan strategy target/priorities for Energy efficiency in the industry (Action 6: "Continue efforts to make EU industry less energy intensive and more competitive").

Compiled by Petter E. Røkke, JP Coordinator in EERA with input from partners within EERA.

Contact information: petter.e.rokke@sintef.no, +47 901 20 221

First; EERA appreciates the involvement in this process and look forward to further dialogue in the iterations towards the completed Issues papers to be developed.

The partners of EERA are involved with and working together with the main industrial stakeholders around Europe on the topic of Energy efficiency, and as such the response from EERA is to a large extent in alignment with industrial perspectives and with the intention to contribute to a more energy efficient industry sector in Europe – independent of the actual product. For the preparation of this document in particular, EERA has been in dialogue with industrial stakeholders and companies (e.g. SPIRE2030).

EERA sees the strong focus on selected Energy Intensive sectors: Iron & Steel, Chemical & Pharmaceutical and Petroleum & refineries. With this limitation for EUs R&I efforts **a significant potential impact is left out** (approximately 40 % of the energy consumption in a European perspective and 50 % globally), for instance industry related to non-ferrous metals (e.g. Al), ferro-alloy industries, ceramics and pulp and paper industry. Further to this, actions on the competitiveness of non-intensive sectors such as food & beverage or machinery present important impacts on the side of jobs creation or production added value and should thus not be left out of the priorities. **To realize the full potential and to achieve the expected impact of energy efficiency there should not be a limitation to three sectors.**

The ambitions of the SET plan could also be higher within this area; based on EERA partners' involvement with industry, our understanding is that industry itself even has higher ambitions and targets than what is stated in the drafted Issues paper. We expect this to be underlined in the response from the industrial associations.

The sections below are considering the specific questions raised in Annex II "The expected outcomes", addressing stage 1 of the step-by-step process.

Do you agree with the targets set in the issue paper?

- **Target 1:** "By 2030, the energy saving potential related to economically viable technologies (i.e. payback not longer than 5 years) is increased by 30% compared to the potential identified in 2015";
 - The importance of value creation for the different sectors is an important perspective within this target. Not just saving energy, but also creating more value for the same energy input. This

*Joint Programme
“Energy Efficiency in Industrial Processes (EEIP)”*

is an important consequence of energy savings which gives a significant benefit for the industry.

- The target indicates an increase in the POTENTIAL. Would suggest to rephrase it to "...realising the potential for specific energy savings...". The upper potential is a fixed limit, whereas we are aiming at closing the gap towards the potential.
 - Concerning the use of "*potential*"; While economical potential here is related to a payback time of less than 5 years, the word “technical” is not equally clear. Does it mean thermodynamically or practically achievable?
- Target 2: "*By 2030, 1/3 of the currently promising emerging technologies are becoming commercially available*"
- This will require development and establishment of R&I infrastructures. The indicators will be challenging to measure - this target seems to be more guesswork than analytic estimation.
 - Further, this depends on the definition of “emerging technologies”.
- Target 3: "*By 2025, develop and demonstrate waste heat recovery solutions (heat exchanger, storage, distribution, and industrial symbiosis)*"
- In general, there is a complementarity of process temperature levels among the industrial sectors, with waste heat recovery achieved in Energy Intensive sectors having the potential to be used as heat source in most of the processes found in such non-intensive sectors. Such interconnection might already fall into the priority of cross-cutting R&I: maximising the economic returns of waste heat recovery, namely under the industrial symbiosis topic.
 - Several technologies for waste heat recovery are already in use. This target should be more specific on closing the gap/releasing the potential for various temperature ranges and for various sectors; to address cross-cutting issues relevant for the different industrial sectors.
 - There is a large potential for technology development, both on short and long term. The main issue is not to demonstrate, but to make these economically viable. The large amounts and the low temperature of many sources of waste heat are the main obstacles for its utilization.
 - We suggest a rephrasing towards "...develop and demonstrate NEW waste heat recovery solutions...".
- Target 4: "*By 2025, improve energy performance of components by 15%*"
- How do we measure "Energy performance"? The real indicator within industry is the specific energy consumption (i.e. energy need per ton of product). This should be considered or included when defining the targets.
 - Energy efficiency is a key strategic asset to stay competitive on a global market, increasing the value for the product by energy savings.
- Target 5: "*By 2020, cost-effective continuous process optimisation technologies help small and large industries reduce their energy consumption by 15%*"
- ICTs role should also be put in a broader perspective of energy management practices and technologies.
 - Providing ICT tools, industries can be enabled to get:
 - Yearly monitoring of consumptions
 - Provision of best practices cut on the single plant needs
 - Clear identification of their areas with higher margins for energy savings
 - Also here our opinion is that the Issues Paper should more clearly be focused on specific energy consumption (i.e. per ton produced).

*Joint Programme
“Energy Efficiency in Industrial Processes (EEIP)”*

Do you think that the level of ambition is correct?

- **Increasing energy efficiency in industry** should be the main overall ambition for the issues paper.
- The targets set for the different priorities are ambitious yet realistic. Yet, their focus is on individual company actions. A stronger focus on energy system integration approaches (referred very briefly in the industrial symbiosis topic) could render it more ambitious; tackling targets related to centralized heat production systems (in industrial parks) and on their integration with the overall energy system (acting e.g. as electric grid storage buffer, in power to heat approaches or in connection with district heat systems).
- Also, there is not a link with consumer driven strategies to reinforce the importance of reducing the energy intensity of industrial production (again especially relevant in non-intensive sectors producing fast-moving consumer goods).

Are there any standing issue(s) in the way to reaching the proposed targets/priorities?

- Financing instruments supporting the take-up of novel concepts towards piloting and demonstration. Transfer of knowledge from R&D and education towards industrial implementation.
- The ambitious targets require also fundamental research that must be takes into account when the TRL levels are set.
- The implementation of energy efficiency measures often implies interference with existing heat production systems, heat distribution networks or even with industrial processes, especially on the thermal side. Such integration requirements, combined with a conservative approach of industrials to existing processes, could become an obstacle to the achievement of the proposed targets.

What are your specific recommendations on prioritising R&I activities on these issues (and building where appropriate on relevant existing initiatives)?

- Cross sectorial approach towards new waste heat recovery solutions, not just limited to the indicated three sectors
- Power generation from low temperature heat sources, upgrading of heat sources
- Development and demonstration of centralized waste heat recovery and redistribution/valuation in industrial parks. There is a need to address industry’s resource and energy efficiency in a systematic way
- From open (existing technology) to semi-closed (new technology) to closed furnaces (future technology) and capturing of heat from top covers
- Development and demonstration of dynamic management models for multi-source / multi-sink heat distribution networks, particularly related to ICT issues
- Development of ICT innovative tools and approaches for monitoring of consumptions, energy management, diffusion of awareness of energy consumption and of possible savings within industry
- Diffusion of innovative equipment in building for valorisation of low enthalpy heat, coming industrial (and other) recovery

Who are the best placed actors to implement the targets/priorities (industry, EU, member states, regions, groups of countries/organisations/etc.)?

*Joint Programme
“Energy Efficiency in Industrial Processes (EEIP)”*

- Most member states have national action plans for implementation of energy efficient technologies¹, and an increased coordination with national initiatives and actions will be important.
- Further to this, a reference value for related funding of such action might be found on the estimated increase in EU contribution on specific H2020 calls, such as EE17 and EE18.

Further we are asked to, if possible, identify gaps/barriers & areas of cooperation on the priorities/targets proposed in the issues paper(s);

Identify possible barriers (when not done already in the Integrated Roadmap) related to regulation, cooperation issues, standardisation / industrialisation / manufacturing, socioeconomics, etc.

- At higher TRL levels (5-9) cooperation challenges between industries become significant due to confidentiality issues, this limits the possibility of cross-sectorial technology transfer.
- At the various temperature ranges for waste heat from the different sectors, not all technologies are transferable.
- To increase the collaboration across sectors, R&I should also include lower TRL levels (2-4) where challenges and knowledge are addressed at a pre-competitive level and where novel concepts can be generated and explored with the intention to realizing the full potential for energy efficiency in a sustainable way.

Identify possible gaps or duplication of efforts in the R&I priorities (based on the Integrated Roadmap):

- The targets set out in the Issues paper could even be more ambitious than what is stated and thus there would be gaps that are currently not defined with the given ambitions/targets. This should also be underlined from the industrial associations giving feedback on the draft issues paper.

Identify priorities where there is scope for and benefit in more coordination and/or cooperation across EU, Member States, regions, Research Institutions and/or industry:

- Will be the same as the prioritized topics given in an earlier question "... specific recommendations on prioritising R&I activities..."

Identify best practices of past or present coordination and/or cooperation that can be used as an example or as a starting point.

- The ECRIA call (H2020 LCE33) is a good example on how the EU funding on R&I can be aligned with national priorities and funding towards R&I. Such an instrument will enhance the cross-border cooperation and also increase the knowledge sharing between industrial sectors.
- Similar calls on ERA-NET projects may have a similar impact.

¹ <https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive/national-energy-efficiency-action-plans>