European Energy Network

Industry and SMEs

Critical challenges and opportunities in energy efficiency and renewable energy

EnR is a voluntary network currently numbering 26 national European energy agencies. They mainly have responsibility for the planning, management or review of national research, development, demonstration or dissemination programmes in the fields of energy efficiency, renewable energy and climate change abatement.

The **EnR Industry Working group** works specifically to support the work of European member agencies within the fields of energy efficiency, policy implementation and competitiveness in industry and SMEs. The work is aligned with the main goals of the new EC Industrial Strategy for a globally competitive, green and digital Europe.

The content of this document does not necessarily reflect the opinion of all the European Energy Network Members.

IWG response to the EASME Consultation on the priorities for the forthcoming LIFE programme 2021-2027

Contents

Context

In June 2020 the European Commission Executive Agency for Small-Medium Enterprises (EASME) launched a Consultation to identify particular market priorities and content gaps to accelerate the energy transition of the Industry and Service sectors in view of the forthcoming LIFE programme (2021-2027).

The EnR Industry Working Group decided to participate and started an internal process of consultation, collecting written contributions from its Member Agencies. In addition to the valuable written contributions received by ADENE, ADEME AEA, CRES, EIHP, ENEA, ENOVA, EST, EWA, IDAE, MOTIVA, RVO and SEDA, a Brainstorming session with EASME has taken place on the 8th of June 2020. During the event, hosting 17 European National Agencies, EASME and DG-ENER Representatives, several other hints and contributions have been collected.

The Industry and Service sectors represent more than 39% of the EU's final energy consumption, equivalent to 21% of the EU's total Greenhouse Gas emission (Eurostat, 2016). European industries have made important progress to improve their energy efficiency and switching to low carbon energy sources; however, opportunities for saving energy remain in most enterprises.
In March 2020, the New Industrial Strategy outlined how Europe will become greener, more circular and more digital while remaining competitive on the global stage. The Strategy proposes a comprehensive set of future actions to transform industry along with to support SMEs to be part of the low carbon transition.

Within this context, both Renewable Energy and Energy Efficiency will continue playing a leading role. Concerning Renewable energy, the recast directive 2018/2001/EU already moved the legal framework to 2030 setting a new binding renewable energy target for the EU for 2030 of at least 32%. Within the European Green Deal, the Commission has pledged to further review the existing legislation and revise it where necessary (August 2020). Energy Efficiency is recognised to not only support sustainable growth, reduce greenhouses emissions and reduce energy costs, but to also increase competitiveness. It is a strategic priority for the Energy Union, and the European Union continues promoting the principle of 'energy efficiency first' in its policy. Event though, at present energy efficiency is still far from achieving its full potential and adequate supporting measures could help increasing the investments in energy efficiency measures.

The contents of the present document represent a balanced summary of the contributions collected for the survey, touching upon opportunities and challenges of both energy efficiency and renewables in the Industry and Service sectors.

Thanks to the large participation of experts from different sectors working for several National Agencies across all Europe, the contents may be useful for policy makers, policy implementers and associations having a role in assessing and shaping Energy and Environmental policies in Industry, Enterprises and Service sectors.

1.1 Waste heat/cold recovery/management

Topic	Waste heat/cold recovery/management
Context	In several resource and energy intensive industries, significant input-energy can be lost in the form of waste heat/cold by gas, liquid or solid streams. The sources of heat/cold losses can be a valuable commercial resource if sold/re-used to other industries and buildings or District Heating and Cooling (DHC) operators. This topic is aiming at improving energy efficiency of industrial parks districts and clusters by unlocking the market potential and supporting the demand and offer of high-quality energy services.
Level of priority	**High**
Motivation	Heat/cold recovery is a process commonly used to increase the efficiency of a production process or a single industry. Waste heat/cold recovery for energy production leads to less consumption of fossil fuels and other multiple benefits, including energy and economic savings. Synergies should be created among industries and the external potential users (through district heating) but also within industrial processes aiming to use the heat/cold recovered from one process to power another one. Industry is already an important supplier of (residual) heat for the built environment and it appears feasible that industrial waste heat potential could meet also a third of the building heat demand in Europe. Technologies already exist, but even if the industrial sector is quite familiar with them the penetration of these technologies is not yet deployed in all Countries. Regional/ local analyses highlight that only a fraction of technically usable industrial excess heat is currently being applied within other processes in an industry, between industries or in HC networks. As an example in Norway almost 25% of all the energy delivered to industry is lost as waste heat, while a 2017 UK government consultation document reports that 11 TWh/yr of industrial heat use in 2014 could have been technically recovered from industrial processes in eight key energy intensive sectors, but that only 5 TWh/yr of this would have been commercially viable. In new supporting programmes for waste heat/cold recovery management initiatives it will be essential to take into account the different size, geographical location and peculiarities of all the EU area Countries. For example the lack of district heating and cooling networks in some Countries (e.g. Malta) provides limited possibilities for the re-use of waste heat/cooling. A common set of barriers to be considered for the future supporting programmes are: • lack of data for the amount and quality of available industrial waste heat and cold; • insufficient knowledge and information, technical barriers associated with the complexity of fitting heat recovery technologies to certain industrial processes;

	• commercial barriers regarding the availability of capital. It would be useful to support a specific follow-up on National Programme results, where applicable (e.g. the Austrian Government Energy Programme includes a national heat strategy where the increase of industrial waste heat and cold recovery has a high priority).
Areas of industrial waste heat/cold recovery that are important	Steel industry, food and drinks and the chemical industry are addressed by more than one respondent. Among the other comments we have also Plastics, Cosmetic, Pharmacy, Cement, Ceramics, Glass, Oil Refining, Pulp & Paper. **R&D**: A high research & development potential can be found in the combination of industrial waste heat and cold recovery and storage technologies. Specific attention should be paid to Industrial Clusters, where a lot of symbioses and synergies can take place between businesses (and the built environment) by exchanging waste and materials. **SMEs**: For non-energy intensive SMEs a barrier could be identified also in the bespoke nature of many waste heat recovery systems (because systems are specific to a particular industrial process and the system to which the heat is deployed) costs of developing and specifying waste heat recovery can be high. In general the support for the development of standardised approaches that can be rolled out to SMEs sector appears to be an important priority.
Further comments	• Awareness for the prevention of possible lock-in effects that may hinder other developments (such as the circular transition). • As an example of promotion of the integration between energy and decarbonisation, the Austrian Association of District Heating suppliers promotes the usage of industrial waste heat for their decarbonisation scenarios. • Supporting measures should pay specific attention to: methodologies to determine the available waste heat/cold per each industrial subsector; introduction of indicators such as available waste heat/cold per production unit (for example, tons of product) per each subsector; economic data for the implementation of heat/waste recovery measures; implementation of legislative and organisational framework for promoting industrial heat and cold recovery; identification of the heat/cold waste recovery potential.

1.2 Energy audits and Energy management systems

Topic	Energy audits and energy management systems
Context	The Energy Efficiency Directive (EED), in its Art. 8, requires large enterprises (non-SMEs) to undergo energy audits every four years unless they have in place an Energy Management Systems as well as it encourages SMEs to undergo energy audits. However, the lack of competences, time and resources prevent SMEs from undergoing energy audits and large enterprises from following-up the recommended energy saving measures.
Level of priority	**High**
Motivation	Energy audits, energy management systems and implementation of energy efficiency measures are considered to be a very high priority. There is a large potential for energy savings both in large enterprises and SMEs. In depth energy audits should be extended to all industrial enterprises (large enterprises and SMEs, in order to achieve the maximum energy efficiency improvement), being appropriate energy audits the first step to make industries aware of their consumptions (energy but also other resources). The actual implementation of the recommended measures is essential to meet both the business goals and the National objectives. Specific supporting measures, also based on the EED article 8 results provided by each Member State, should take into account: • the extent to which the obligations on carrying out recommended measures could affect the audits (e.g. if compulsory, the auditors or entrepreneurs could no longer report all the measures, but only those which are economically profitable and include no risks); • to evaluate the benefits of including also the resource efficiency (water, materials) in energy audits; • to promote a common language among different players (financial, enterprises, professionals); • to measure the real effects of ISO 50001 on long periods with monitored programmes. More specifically on **SMEs**: • SMEs which are not obliged to implement energy audits often refrain from doing so. As the implementation rate of energy efficiency measures in SMEs and large enterprises is still quite low, such activities need to be supported also under the new programme. To support the energy transition, it is important to encourage SMEs to implement recommendations from energy audits. • Addressing the substantial cost-effective energy and carbon saving potential in SME buildings requires the adoption and uptake of robust energy audits with accompanying implementation support. Audits are essential because building owners in the SME sector typically do not have the staff or expertise to carry out a detailed assessment of the potential for energy efficiency in their buildings.

Areas where implementing the energy audits recommend. is important	Energy efficiency measures in Industry have a relevant potential in terms of energy savings for the National energy efficiency targets. The Life programme could support innovative programmes that find new ways to understand and influence the institutions, norms, codes of practice within which SME owners and managers operate, with a view to changing the "practices" around energy use in businesses. More in detail: • Business models need to be developed and proposed to industries for the implementation of recommendations from energy audits. • It should be payed attention to areas that have the potential to promote combined savings and to measures that promote the use of renewable energies, circular economy and the water-energy nexus (as this often is not considered relevant). • Various opportunities could come from cooperation between industrial companies and energy suppliers for energy savings measures implementation of mutual interest. • Encourage the development of processes and standardisation so that the customer journey beyond the audit is clear and of high quality- from the audit through to financing installation and M&V. For example, in the UK, such a process standard is currently under development. • Support the integration of energy audits in a joined up commercial service offerings – developing new business models and digital tools to provide a single integrated service journey from audit through to financing and installation and monitoring and verification. • Look for new or improved incentive schemes for enterprises to implement measures. For example, the Austrian Government Energy Programme includes SMEs in energy audits and supports the implementation of measures. • Last but not least, it is commonly recognised that SMEs should be strongly encouraged in carrying out energy audits and implementing EE measures. This topic will be analysed in the LEAP4SME project (9 EnR National agencies involved).
Further comments	Support for the technical development of energy audit systems and methodologies is also important. Areas where energy audit methodologies could provide better coverage are: • Allow SME owners to understand the potential for cutting carbon and energy bills through demand management. • Increase coverage of the full range of technologies within audit recommendations. • Improve data on technology costs to strengthen report recommendations. • Increasing digitalisation and standardisation of approaches in these areas.

1.3 Joint Actions

Topic	Joint Actions
Context	EU-funding alone is not expected to be sufficient to ensure energy efficiency targets are met. Past calls invited 'jointly funded actions' or 'joint actions', which were funded partly by H2020 and partly by a third country or international organisation towards increasing energy efficiency in industry and services.
Level of priority	**Medium**
Motivation	The energy and climate challenges for industry are too big for one Country or one business alone. There is a need to work together across borders – to realize EU policy and Paris Agreement goals in a way that enhances the position of the European Industry. **Positive aspects**: these actions will contribute to the reduction of implementation cost, the increase of energy efficiency as well as the best use of resources. It is a positive initiative particularly useful for improving country-based specific technologies or policies, for a future possible wider use in countries with similar features. In case of international organisations this appears to be interesting to the extent of improving the knowledge and exchange reliable data on cross-cutting energy solutions for industry and policies (e.g. ISO 50001). **Points to be addressed**: despite this type of funding is very relevant in order to establish partnerships and research when EU-funding is not enough, joint actions are sometimes difficult to set up, as the "third country or international organisation" funding is not easily assured. Joint actions are useful to the extent that do not complicate the process, rather streamline it. If they should bring along more bureaucracy, the targeted impact might fade out.
Areas where the implementation of joint actions is important	• Promotion of low-carbon technologies with a wide potential localised in specific areas/Countries (e.g. district heating from biomass, solar heating, Photovoltaics + heat pumps). • They are important for measures with long payback periods (e.g. more than 7-8 years). • Cross-border infrastructure (including CO_2).
Further comments	• The transition towards climate neutrality should also be perceived as a business opportunity for Europe. Together with member states, the European Commission and Energy Intensive Industries, we should act to achieve sustainable growth, competitiveness, a level playing field and climate neutrality. • Joint actions with the UNIDO in the area of energy audits, industrial waste heat and e.g. long-term agreements with industries would be interesting, or with partner countries of national or international Energy partherships could be developed. • Regional studies on how to improve heating and cooling in the services sector.

1.4 Energy cooperation and mutualised Energy services

Topic	Energy cooperation and mutualised Energy services
Context	The energy efficiency of industrial areas can often be optimised through energy cooperation and joint contracting of mutualised energy services among businesses. Such services could take either the form of energy that is produced collectively and locally or tailor-made energy services jointly procured that help the companies minimize their costs and increase energy efficiency.
Level of priority	**High**
Motivation	The concept of energy cooperation and mutualized energy services activities are very interesting, implying energy savings for all participants involved. They should be strengthened and new solutions and models must be found to make them more convenient, since at present they do not appear to be common practice within industries. Particularly for SMEs, cooperation could be a successful way of overcoming high costs of implementation. For these purposes, local industry and services are mostly organised within industrial parks and the cooperation between companies would have even more impact in these situation. A relevant barrier is that the success does not depend only on the company who wants to apply it, but also by other potential consumers of their energy and their will for cooperation. Initiatives in promoting the opportunities and dialogue among users/ producers are considered welcome, as well as supporting programmes for a harmonisation and simplification of each Country specific rules (e.g. removing barriers for selling electricity to neighbours).
Areas where the energy cooperation and mutualised energy services are considered important	• The establishment of energy centres in industrial parks which could monitor industries located within industrial parks collectively, advise them on energy efficiency opportunities as well as funding opportunities. Targeting SMEs wherever feasible. • Collective measures aimed at improving energy efficiency, specifically for thermal and electrical use. • RES installations (e.g. wind farms, PV fields) collectively owned by companies. • Collaboration between Industrial companies and energy suppliers obligated under EED art. 7. • ESCO market promotion.

1.5 Innovative Energy efficiency services

Topic	Innovative Energy efficiency services
Context	Energy efficiency finance is a growing topic, which includes new funding approaches and business models to better monetise the future energy savings for initial investments. These can include, for example, new energy efficiency services such as Energy Performance Contracting (EPC) combined with innovative financing solutions.
Level of priority	**High**
Motivation	Activities supporting innovative energy efficiency services show a relevant importance, as they offer a coherent response to: environmental motivations (by guaranteeing a reduction in energy consumption and greenhouse gas emissions over time); technical motivations (thanks to better management of building operations); financial motivations. There is a relevant gap between the high interest in energy performance contracting and the supply of contracting solutions and energy efficiency. Moreover EPC for Industries could be difficult to be optimized as the energy tariffs are usually lower than the ones applied for a general consumer. Nevertheless, energy efficiency finance is a relevant topic that should be promoted. Financing, which is always a major key point in energy efficiency decisions, is repeatedly identified by policy makers and businesses themselves as key to the adoption of energy efficiency measures. A key focus in supporting the development of financing could be to understand how new energy efficiency services can be integrated into a landscape alongside: • Regulation – e.g. how financing can help building owners meet minimum energy performance standards. • Engagement, advice and audits. • Supply chain development – the link from finance to quality installations (support for new M&V approaches is key here). Several initiatives (such as the EEFIG initiative) and interesting results are already available on the energy efficiency finance hurdles and proposed solutions. Two barriers, already properly addressed, should need to be further investigated/promoted: to promote a common language among different players (technical, financial, managerial) and investigate energy efficiency financial co-benefits. Concluding, when considering financing it is important to be aware of the wider economic landscape for SMEs – and particularly the unprecedented recession that is likely to follow the Covid crisis (the current situation due to the COVID-19 crisis should be taken in to account also for non-SMEs). Public intervention to manage and minimise credit risk is likely to be important if these solutions are going to gain widespread uptake over the next few years.
Areas where the implementation of joint	• Investigation of co-benefits in terms of energy efficiency and climate mitigations specifically in terms of avoided costs.

actions is important	• Promotion of ESCO and EPC in industrial sector and development of EPC schemes tailored on industrial needs. • Promotion of ISO standards such as ISO 50015, ISO 50047 and recognised international protocols. • Strengthening M&V not only through protocols but in making new affordable M&V services widely available. • Training of technical staff of industries to support the implementation of EPCs. • Standardisation of systems and processes particularly allowing aggregation of smaller projects. • The development of funding approaches and business models that promote the creation of win-win solutions, that monetise energy savings and promote energy efficiency, is particularly important. It also should be payed attention to business models that directly result from innovative research. • Energy Performance Contracting combined with innovative financing solutions. • New financing possibilities in combination with “tailor made efficiency packages/ offers” will be more and more important to implement energy efficiency measures in SMEs. Financing models/investment schemes and business case building.
Further comments	Industries are reluctant to allow other parties in their businesses. This applies to both the top management and the technical staff (each for its own different reasons). This topic could be addressed with the introduction of a facilitator. In some areas it is particularly felt a lack of clarity in the market and a lack of trust and capacity.

1.6 Member States Actions

Topic	Member States Actions
Context	Member States can increase the competitiveness of European SMEs by providing them with information (for example about legislative requirements, criteria for subsidies to upgrade machinery, availability of training on energy management and of energy experts) and develop appropriate incentives (such as tax rebates, financing for energy efficiency investments, or funding for energy audits).
Level of priority	**High**
Motivation	Constant source of new information is considered very important, as well as sharing knowledge through existing best practice examples is the best way to convince industry owners to adopt new energy efficiency measures. The measures that can be taken by a Member State to increase SMEs competitiveness, namely providing them with information and incentives, are fundamental to deploy energy efficiency and promote renewable energy use in this context. Member States are uniquely positioned to support SMEs and industry and increase overall European competitiveness through running advice programmes, fostering awareness-raising and creating necessary incentives, so their role cannot be understated and need to be highly prioritized. It should be also considered that Member state actions could be counterproductive due to the free-rider phenomenon. The training and information programmes keep being a priority for making the SMEs aware of the range of opportunities provided by each Member State. Being SMEs an across-the-board topic it is inevitable that obligations and incentivisation are split among different programmes managed by several entities under both National and local levels. Efforts in providing support for shared platforms and information programmes to collect updated and reliable information for SMEs owners and energy professionals could definitely lead to increased access to the available opportunities. More specifically on SME, the market failure around cost-effective energy efficiency is greater for small businesses than it is for larger businesses. Yet, in a number of countries, policy mechanisms to support and drive energy efficiency in the SME sector are limited as compared to either the domestic sector or the non-SME sector. Public actions are needed to overcome that market failure and improve competitiveness. Some Countries are already running this kind of Programmes, as this is for example the case of Spain where since 2015 through IDAE's Grant Program to Improve the Energy Efficiency in SMEs and in Large Companies of the Industrial Sector, aimed at incentivizing the implementation of actions in the industrial sector that reduce carbon dioxide emissions and final energy consumption. Also where schemes are in place, it usually requires particular effort to get more participation from the companies.

Areas where the Member States Actions actions is important	**All industry and SMEs**: • Information, awareness-raising, training. Getting the companies more involved to increase the uptake of the schemes and participation. • Benchmarking system on national and European level. • Member State actions are fundamental to support SMEs, namely the activities related with legislation requirements information, training availability and financial incentives (taxes reduction and financing support). • If a new technology is presented and it is not very often applied, these actions are important in increasing their application. • Use of regulation particularly to address the split-incentive barrier to action on building energy efficiency in rented/leased buildings – e.g. the use of minimum energy performance standards for buildings. • Public Financing Mechanisms. • Market development activities – supply chain and financing (e.g. actions to underwrite risk around private sector energy efficiency financing, Quality and process standards for energy efficiency in non-domestic settings). **SMEs**: Member State actions are fundamental to support SMEs, namely the activities related with legislation requirements information, training availability and financial incentives (taxes reduction and financing support). The EU industry, accounting for 80% of goods exports, has got two important peculiarities: it is largely made up of SMEs in terms of numbers (over 99% of all European firms – the vast majority of which are family run companies) and it has a global competitive advantage on high value-added products and services, and leads by example complying with the highest social, labour and environmental standards. These are the two strengths on which all MSA could be built, tailoring them for each Country (or group of Countries) specificity.

2.1 Digitalisation

Topic	Digitalisation
Context	Digitalisation involves new digital technologies, process automation as well as data generation and has the potential to transform many sectors. For industry and services, digital solutions are expected to drive higher energy efficiency by enabling flexible energy use, optimising existing processes and improving plant engineering and design. Additionally, digital solutions could enable behavioural change among the whole staff of the company at both operational and managerial level as well as enhancing the energy corporate culture of the company. Digital solutions could also support the production and/or use of renewable energy to meet the energy demand of companies.
Evaluation (Opportunity/ Challenge)	It will provide a significant opportunity to improving energy efficiency and renewable energy. It will present also a significant challenge to improving energy efficiency.
Key opportunities	Digitalisation is perceived to be a strong opportunity and a strong challenge for energy efficiency and more an opportunity than a challenge for renewable energy sources (RES). For both energy efficiency and RES it represents a relevant opportunity for direct benefits and co-benefits. First ones include increased knowledge of consumption/production, optimisation of production-loads, product optimisation. Co-benefits include the opportunity of relying on more accurate M&V plans for an easier access to financial resources. Through digitalisation the industry has the possibility to collect data and gain knowledge and experience that can be used for improvements and learning and enable for further development. Digitalisation will significantly facilitate increased energy monitoring within an industry and the use of digital technology will enable greater energy efficiency gains, including active energy management systems (EMS), data-driven consumer engagement platforms, and new performance-based revenue models. Digitalisation will also act on effective/efficient operations, cost-effectiveness (streamlining and speeding up processes) and on the reduction of the administrative and financial burden for energy efficiency and RES projects and would be a stimulus for their implementation. About the audit process, it can link customers through seamlessly to wider advice, information on regulatory compliance, and link to sources of private sector financing. Furthermore, IoT (Internet of Things) implementation could support maintenance procedures, energy management actions and renewable energy production. According to IEA, enlarging the boundary to the demand side, digitalisation's impact appears to be much more complex to be evaluated. Whilst digital devices potentially offer considerable improvements in energy efficiency for single sectors (e.g. industry), the prevalence of more devices and equipment (e.g. servers) could lead to relevant net increases in energy use, if not managed carefully.
Support needed to	• Capacity building and training activities on the technologies available, their costs of implementation and their benefits. Programmes addressing the global cost-benefits for Member States and EU on a wider scale than a single end-use sector.

maximise the opportunities	• Education on digitalisation, connecting all producers and customers, site visits to best practice examples. • Programmes addressing the global cost-benefits for Member States and EU on a wider scale than a single end-use sector; programmes supporting the evaluation of the digitalisation industrial potential; programmes aimed to certify components and/or market players offering reliable data protection solutions. • Financing research and new projects development and implementation. • Support pilot studies and information sharing. Focus on making researched technology more commercially available for widespread roll out within industry and services. Digitization is crucial to make renewables such as solar energy more reliable and easier to integrate with the main grids. • Programmes aimed to certify components and/or market players offering reliable data protection solutions. • Funding for early investments, good practices.
Key challenges and proposed solutions	• Lack of knowledge among technical staff since Industry 4.0 is a relatively new approach; co-financing training and dissemination activities could definitely help. • Most of technologies related to the concept of digitalisation are still relatively expensive and not all companies (especial small ones) can afford their large use. Special area of expertise is also needed. Rising awareness about the benefits of digitalisation would be helpful. Also creating centralised solutions (as e-services for example, or institutional platforms) could facilitate the access for the small businesses to digital technologies. • Digitalisation is crucial to make renewables energy more reliable and easier to integrate with the main grids.

2.1 Electrification

Topic	Electrification
Context	Electrification in industry and services means also replacing fossil fuels with renewable electricity. Swapping to the massive use of electric solutions (e.g., heat pumps, hybrid boilers, EV fleet) can enable decarbonisation and increase the overall energy efficiency of the company. Furthermore, energy efficient solutions applied in the industrial and service sectors can be used as a tool for power system balancing enabling new added-value services of demand response. Finally, the production and/or use of renewable energy sources and storage could be further investigated in the existing or new industrial processes (e.g. using advanced solar energy technology to provide clean heat/cooling for the company).
Evaluation (Opportunity/ Challenge)	It will provide a significant opportunity to improving energy efficiency and renewable energy. It will present also a significant challenge to improving energy efficiency and a small challenge to improving renewable energy.
Key opportunities	Electrification is currently considered an attractive decarbonization pathway for most sectors (industry, buildings, transport) and in fact most long-term forecasts of final energy demand show an increase in electricity across scenarios and sectors. The adoption of renewable energy in industry is a rapidly developing domain with very large impact on the performance and operation of the industries. It is seen as the key area to develop a CO_2 emission free industry by 2050. Renewable electricity will be mainly supplied to the industry in three modes: • Power – direct supply of 'green' electricity to drive electrically powered processes • Heat – for any thermal driven industrial operation (separations, drying, many others) • Energy carriers as base building block for products and as intermediate energy storage (e.g. H_2, NH_3, Methanol) If the cost of electricity continues to be significant, this will drive industries to search for lower-cost solutions for its generation. Hence, this will be an opportunity for the installation of RES – electricity installations, especially after constant decreasing price of PV modules. Nevertheless, the introduction of renewable energy remains a challenge as due to the usually relatively high investment costs which will determine the cost of renewable energy, they may be not be competitive to the fossil fuels cost. Concluding, replacing fossil fuels with renewable electricity for sure is beneficiary for the bigger picture – decarbonisation and long-term perspective for changes in the energy system. It is a very complex process and the opportunity is significant on national level but relatively small on company level. It is in general definitely an opportunity as long as there is a reduction in the energy consumption.
Support needed to maximise the opportunities	• Facilitate companies in assessing new solutions • Promote self-consumption and prosumers- model • Increase the role of SMEs in the energy transition • Encourage the sharing of resources • Increase the flexibility of the market and, more generally, of the economy

	• Capacity building and training activities on the technologies available, their costs of implementation and their benefits • Co-financing, education, site visits, energy audits
Key challenges and proposed solutions	It is of utmost importance to guarantee the reduction of the energy consumption, also considering that if the cost of electricity falls, this will be counter-productive to energy efficiency and/or renewable energy. A comprehensive approach is needed: as more electrification takes place, equipment has to become more and more efficient to be able to sustain increased demand. On the production side, green electricity is essential to achieve decarbonization, however it will also be needed in other sectors. Given the amount of energy involved, using electrification for deep decarbonization in industry alone would need enormous amounts of green power production as well as increased attention and investments to the network capacity and to storage solutions (especially for non-programmable RES). Fuel switching from fossil fuel–based processes to electrified ones can offer product and productivity benefits, but operating costs are in general much higher than fossil fuel-based process. Either lower costs of electricity and energy storage are required and/or new, cost-competitive electric-technology applications are needed to enable further electrification of industry. In order to overcome the challenges also the importance of Corporate Social Responsibility should be stressed. Specific aspects to be considered in the Programme: • Financing research and new business models and projects development and implementation. • Support commercialisation of equipment to make it a better investment for industry and services, thus making electrification more possible. • Capacity building and training activities on environmental management schemes and environmental labels.

2.3 Industrial Symbiosis

Topic	Industrial Symbiosis
Context	Industrial symbiosis involves the exchange of underutilised energy between two or more production sites or sectors, usually in close geographical proximity. In these transactions, waste energy of one company or site are integrated as inputs into another's production process. This can therefore increase energy efficiency. Moreover, the creation of local networks of companies (on voluntary basis) and experts committed to meet common energy efficiency and renewable targets could be further promoted. In this regard, synergies within industrial park's relevant stakeholders could facilitate the development of renewable energy production plants to meet the local energy demand.
Evaluation (Opportunity/ Challenge)	It will provide a significant opportunity to improving energy efficiency and renewable energy. It will present also a significant challenge to improving energy efficiency and renewable energy.
Key opportunities	It is strongly recognised among the national Agencies that industrial symbiosis is both a great opportunity and a challenge for energy efficiency and renewables. Industrial symbiosis provides an excellent opportunity for companies to work together and exchange material, water, and energy streams, increasing energy efficiency, resilience and economic gains, while reducing the environmental impact and expenses. It creates new business opportunities and jobs and contributes to close the loop for industrial resources. It has also a positive impact on industry revenues and can lead the way to transitioning towards more sustainable industrial practices and promote the use of renewable energy. As the majority of industries in the EU are SMEs, the implementation of energy efficiency and/or renewable energy actions are often not financially feasible due to either the long pay-back period or the difficulty in obtaining financing from financial institutions due to the relatively small budgets involved. By clustering the actions these obstacles can be overcome. Connecting industries is also important when the organic waste is energy source, since the initial investment is high but decreases if the system is bigger. Concluding, complex system changes to industry are achievable and can provide competitive advantages. Synergy benefits can be achieved through the optimisation of the use of feedstock and materials streams through cooperation between businesses in industrial hubs. System changes require cross-sector cooperation between public and private sector parties, the flexibility to learn and experiment, the deconstruction of non-sustainable structures and the construction of sustainable structures.
Support needed to maximise the opportunities	Given its particular features, Industrial symbiosis is a complex process that must be facilitated through the support of experts, in the role of facilitators and consultants, local institutions, public bodies, associations of enterprises, etc. Support should be provided to: • Actions that will bring together the relevant stakeholders and allow them to be informed of the opportunities available and to discuss possible interactions. • Industrial clusters can achieve more by taking up infrastructure needs, coordination issues, help of knowledge centres, Regional execution/ implementation structure for synergies and consensus among players.

	• Financing research and new projects development and implementation. • Promotion of pilot studies and information sharing about successful projects that have been implemented. • Co-financing, education, site visits, energy audits.
Key challenges and proposed solutions	• The introduction of renewable energy remains a challenge: the high cost of RES investments, which will determine the cost of renewable energy, could make RES not be competitive to the fossil fuels cost. • Changes in the operations of the enterprises: different business units of an enterprise have their own budgets and plan operations accordingly; common projects of business units is thus a challenge to overcome. • Industry and services are a competitive environment and sometimes this creates obstacles for symbiosis. • Studies should be carried out on possible policies and systems that allow a legal basis to sustain collaboration whilst safeguarding the interests of all parties.

2.4 Sustainable energy value chain

Topic	Sustainable energy value chain
Context	The entire value chain shall be considered when decarbonised the industry and service sectors, in order not to shift the carbon footprint from one level to another. SMEs and large companies can jointly share innovative business models and approaches enabling new added-value services that can facilitate the low energy transitions. Large companies can play a crucial role to facilitate SMEs operating in the whole supply chain to implement energy efficiency measures. Similarly, SMEs and start-ups can help more established companies to adapt their business models and becoming more energy efficient and sustainable. Furthermore, the collaboration between SMEs and obliged parties (as defined in art.7 of the EED) can be beneficial to foster the market uptake of energy efficient solutions.
Evaluation (Opportunity/ Challenge)	It will provide both a significant opportunity and challenge in industry and services
Key opportunities	Building a sustainable energy value chain and introducing it in industry and services will be the way to integrate an overall transition to innovative business model (i.e. circular economy). In fact the energy value chain should be defined through a holistic vision including materials (for energy) and following life thinking approach. This will be impacting also in energy efficiency, providing new approaches to energy savings and an overall larger impact that looking at single sectors. The creation of a sustainable energy value chain could include some of the previously mentioned opportunities, namely digital transformation and industrial symbiosis. This represents a major opportunity to promote joint innovative business models, new added-value services and the collaboration between the links of the energy value chain, generating innovative models for energy management. With the pandemic changing the business environment there might be a stronger will to consider value chains. Even though for SMEs, where time and capacity are key barriers to their action on energy.
Support needed to maximise the opportunities	• Working with industry associations and industry sector leaders to establish forums to develop approaches, codes and practices. • Identify champions from SMEs and large business sectors. • Public funding – probably to directly reward SMEs in their involvement in the early stages of these initiatives. • Financing research and new projects development and implementation. • Looking at models adapted in smaller companies that can be replicated in larger entities, possibly re-modelling certain ideas at a larger scale.
Key challenges and proposed solutions	It is still a challenge to integrate material resources and energy, because an integrated vision has still difficulties to be implemented. The programme should support actions with an overall vision, not only specific proposals.
Further comments	Energy efficiency could be promoted thinking also to the overall sustainability of materials and procedure.

2.5 Local Integrated Environment

Topic	Local Integrated Environment
Context	The development of a "Local Integrated Environment" is of utmost importance to enable Local Authorities (LAs) and companies to closely collaborate with the aim to foster the actual implementation of energy efficiency and/or renewable energy projects at local level. Synergies from relevant public and private stakeholders can lead to the achievement of important mutual benefits enabling the reduction of the carbon footprint at local level. In this regard, industrial sectors could be supported by LAs to implement their sector specific Industrial roadmaps aiming at reaching the low energy transition's objectives.
Evaluation (Opportunity/ Challenge)	It will provide a significant opportunity for both energy efficiency and renewables in industry and services.
Key opportunities	The development of a Local Integrated Environment could represent a valid opportunity to promote the collaboration between Local Authorities (which have wider knowledge than National Authorities on the local peculiarities, resources and business environment) and private entities, finding a common ground and establishing basis to reach tangible objectives. It would allow the possibility of devising a roadmap towards better energy efficiency and more renewables that is more in line with industry and services requirements, also considered that a number of energy efficiency and renewable energy sources projects depend on LAs infrastructures and long terms plans. An example of opportunity could be creating synergies in the mobility industry with private sector developing electric vehicles and LAs providing financial aid/guarantees and enhancing storage/recharging stations.
Support needed to maximise the opportunities	• Projects promoting the dialogue between public and private entities, to make both parties aware of the possible synergies. • Studies and sharing of ideas about success stories in such areas. The Programme should also look at "thinking outside the box" ideas that can results in such collaborations.
Key challenges and proposed solutions	The collaborative approach is the basis for integrated multi-stakeholder solutions, and this is the case also for local integrated environment. The active collaboration among different actors needs strong motivation (not only market driven). Even if more complex, the collaboration will be appreciated as more fruitful if it is enlarged to a multidimensional vision not only focusing on energy, but including also raw materials, bioresources, water, waste, services and other issues. Fostering actions and legislative measures should therefore focus on stressing the need for integrated and homogeneous approaches for any kind of resource (both energy and non-energy resources) promoting integrated and multidimensional collaborative solutions.
Further comments	Even if more complex, the collaboration will be appreciated as more fruitful if it is enlarged to a multidimensional vision not only focusing on energy, but including also raw materials, bioresources, water, waste, services and other issues.

ANNEX I: Key messages for the future Life programme

- **Raise co-financing rates**
  The significantly lower co-financing rates will deter many stakeholders from participating in CET sub-programme projects. Market uptake projects need a multidisciplinary and holistic approach that implies the participation of companies from both the public and private sectors.
- **Simplify administrative & management procedures**
  As LIFE is far more onerous and complex than Horizon 2020, it is necessary to harmonise the administrative and management procedures of LIFE and Horizon 2020/Horizon Europe in order to reduce administrative costs and burdens for beneficiaries.
- Maintain **broad geographical approach**.
- Raise overall **level of funding**
  Given the need for urgent actions, 1 billion euros over 7 years across 27 Member States does not seem realistic to meet the increased ambition of the climate change and energy policies in the European Union and the UK, especially now, as set out in the new European Green Deal.
- **Involve energy experts in the LIFE Committee work**
  It is essential that the LIFE Committee members join forces with energy experts for the thorough development and smooth operation of the Clean Energy Transition Sub-programme.
- Strong interest in the topics of **Digitalisation, electrification and Industrial symbiosis**. All of them are perceived to be a **strong opportunity and strong challenge for energy efficiency**, while **Digitalisation and Electrification appear to be more an opportunity than a challenge for RES**.
- **Energy audits, EMS and implementation of energy efficiency measures are considered to be a very high priority**. On these basis, it will be crucial to take into account:
  - the extent to which the **obligations on carrying out recommended measures could affect the audits** (e.g. if compulsory, the auditors or entrepreneurs could no longer report all the measures, but only those which are economically profitable and include no risks);
  - to **include efficiency of resources** (water, materials) in energy audits, which will allow SMEs to give more payback;
  - to **promote a common language among different players** (financial, enterprises, professionals);
  - to **measure the real effects** of ISO 50001 on long periods.
- **Circular economy and resource efficiency** are considered to be of utmost importance and funds may help here. It would be fruitful to evaluate approaches (leading to future business models) towards a multidimensional vision not only focusing on energy, but including also raw materials, bioresources, water, waste, services and other issues.
- **Covid 19 recovery**: due to the impacts of the Covid outbreak, it is a priority to understand how and how much enterprises and particularly SMEs have been affected in terms of business. Both Easme and DG-Ener mentioned attention to the Covid impact, this is very positive. High attention should be put also to ongoing or recently approved projects dealing with industry and enterprises, to look for suitable options according to the ongoing restrictions for the project execution (travels, shift from in-person meetings to web-meetings) and mutated scenario (new priorities for enterprises which could lead to lower interest in energy and climate topics).

ANNEX II: Agenda of the Brainstorming Session with EASME and DG-ENER

EASME Stakeholder Consultation on the future LIFE – Clean Energy Transition

Funding Priorities for SMEs & Industry

8th June 2020 (14.45 – 17.15 CET)

Moderation

Enrico Biele (**ENEA**), Industry & SME WG Leader, **EnR**

Contributions

Barto Piersma, Head of National Programmes, **RVO - EnR** Presidency 2020 (14:50-15:00)
Introduction and welcome

Vincent Berrutto, Head of Unit, **EASME** (15:00-15:15)
Overview of H2020 Energy Efficiency funding for SMEs and industry projects

Margot Pinault, Policy Officer, **DG ENER** (15:15-15:30)
The future Life programme and the Clean Energy Transition sub-programme

Samantha Morgan-Price, Senior Consultant, **Ricardo** (15:30-15:40)
Rationale and explanation of the survey for the sector of industry and services

Tour de table of National energy agencies and short intro on awareness and involvement in IEE and H2020 programmes (15:40-16:00)

Open discussion (**all participants**)

Relevance of past and existing topics for the future challenges (16:00-16:30)

Key challenges/opportunities where LIFE can help make a difference (16:30-17:00)

Conclusions (17:00-17:15)