

EuropeOn's full position on Smart Sector integration

EuropeOn, the electrical contractors' association, welcomes and supports the initiative of setting out a clear strategy to link sectors in view of more energy efficiency and GHG reductions. Electrical contractors employ the professionals carrying out electrical works and installations in buildings and on infrastructure. Comprising almost 2 million professionals across Europe, they have a unique, on-the-ground, experience of how sectors are or can be integrated and of how electricity use can be extended and they benefit from a proximity with end-users stemming from their local role, doing home visits.

EuropeOn would like to bring the electrical contractors' experience on the best way to sign roles for energy carriers:

Direct Electrification is key to a future-proof smart sector Integration

Electricity technologies have evolved at a very fast pace and are now able to drive decarbonisation for many sectors, through smart sector integration. This is why we believe that electrification should be incentivized in all the sectors which can be electrified.

Indeed, direct electrification, when it is possible, is always more efficient than using electricity to produce renewable gases. With the upcoming Recovery plans and the strategy for Smart sector integration, the European Union as well as Member States have all the necessary tools to roll out massive plans for electrification.

It is of the utmost importance to highlight this efficiency as it will enable large shares of the hard-to-abate sectors to switch to zero-emission alternatives. Proven electric solutions are currently on the market and with rapidly decreasing electricity generation emission and the possibility to further increase efficiency with on-site renewable generation, they offer greenest and most attainable way out of fossil fuels. While renewable gases will be needed to cover parts of sectors where electricity is not the best suited, such as long-haul heavy transport or heavy industry, the current inefficiency and capacity of RES gas production mean it should be prioritized for the aforementioned sectors.

For the transport sector, battery-electric vehicles have the best efficiency and can easily be charged at home, using on-site solar power. Further, EV sales have been on a dramatic rise in the past year showing a wider acceptance and maturity of this technology to cover most user needs. Hydrogen is also poised to have a role in transport but should be kept for uses where electrification is impossible, such as heavy-duty trucks and deep-sea shipping. Further, alternative fuels infrastructure will need a strong boost in the next AFID revision and the cost of refuelling stations for gases is ten times as expensive as charging stations, entailing a much greater cost to alleviate range anxiety.

For heating and cooling, electric heat-pumps can cover these needs with a 100% renewable and zero-emission energy use. Indeed, heat-pumps have a multiplier effect when it comes to the power used. Where traditional gas boilers have an efficiency rating of around 50%, electric heat-pumps go up to 285%, making the most of the available power. Further, heat-pumps can be powered with on-site solar PV or by excess renewable generation with Power-to-Heat applications, thus contributing to avoiding curtailment.

Smart Sector Integration and the Renovation Wave have many synergies for each other

It should be noted that buildings are an ideal hub for sector integration. This is where transport, electricity, heating and digitalisation meet and work together for the most efficiency possible. Indeed, electricity goes hand in hand with digitalisation. New technologies such as Power-over-Ethernet, where data and power are supplied via the same cable, are already available to accompany the digital electrification of our energy uses. This strategy should be linked to the upcoming renovation wave to ensure buildings are ready to accommodate all the sector integration technologies available.



Barriers to lift for a successful integration

- Fair competition and a level playing field have to be safeguarded in order to offer the most competitive solutions to end-users. Major players in the energy sector have to be regulated for them not to abuse their dominant position.
- Sending the right price signals to end-users is paramount to the business case for electric alternatives to currently fossil devices. For an EV user to unlock the potential of his vehicle on the energy market, a sound time-of-use pricing needs to be established and flexibility markets need to be developed to incentivize energy services at larger scales.
- Shortage in workforce and shortage in skills: Electrical installers across Europe report huge vacancies due to a lack in curricula and a poor image of the sector. They are working on it through the [#Skills4Climate campaign](#) but need amplification from public authorities.
- A prerequisite to smart sector integration in the built environment is to have future-proof electrical systems that can support electrified integrated technologies. This is why Electrical contractors call for incentives for deep renovation of electrical systems, through the Renovation Wave and this Strategy.

In short, direct electrification offers, by far, the most energy efficiency and is an ideal solution to ensure a local and decentralised integration of renewables. Such a system will provide drastic GHG reductions all the while keeping costly grid investments to a minimum.

Finally, direct electrification is the best way to foster consumer empowerment. Should buildings be prepared for sector integration, direct electrification and digitalisation, end-users will be in the driver's seat concerning their energy use. With on-site power generation, storage, energy management, electric heating and cooling, and e-mobility, consumers can implement their own, private and local energy system and be in control of both energy production and usage.



- 1. What would be the main features of a truly integrated energy system to enable a climate neutral future? Where do you see benefits or synergies? Where do you see the biggest energy efficiency and cost-efficiency potential through system integration?**

EuropeOn welcomes and echoes that addressing the “opportunities to increase the use of (...) electricity via electrification of sectors that still rely on fossil fuels” should come first, as presented the roadmap for “an EU Smart Sector Integration Strategy”.

Electricity should indeed be a main feature of truly integrated energy systems. This energy carrier underpins the links between sectors and enables zero-emissions solutions, all the while providing the highest levels of efficiency in the case of direct electrification.

Direct electrification is more efficient than indirect electrification (i.e. producing renewables gases via electrolysis) as less conversion is needed entailing less energy losses. Further, new sectors can benefit from electric, and zero-emission, solutions as technologies have matured to be efficient and viable at large scale. Heating and transport are prime examples of carbon-intensive sectors that can be powered by electricity, leading to no end-use emissions and higher efficiency ratings.

Electrification comes with the most synergies and integration potential, even at local level and in decentralised energy systems. Electric technologies can be directly powered by onsite renewable generation such as solar PV and minimise conversion and transformation losses, and integrating mobility and heating solutions that are traditionally reliant on fossil fuels.

Additionally, e-mobility and electric heating have a high integration potential as they can become a resource for electricity grids and systems. Electric vehicles can better integration variable renewable energy sources, and then support the grid in times of low generation (e.g. with vehicles-to-grid solutions and smart charging). Similarly, heat-pumps can store excess renewable electricity in the form of heat (i.e. power-to-heat) and avoid curtailing.

Buildings are an ideal hub for sector integration. The aforementioned synergies between transport, heating and renewable power generation can take place in buildings, whether it is large commercial/industrial or smaller residential buildings, and can turn our building stock into a solution for decarbonisation policies.

These integrated buildings, coupled with digitalised and modern electrical systems can turn simple consumers into prosumers and empower citizens to contribute to the energy transition at their level.

- 2. What are the main barriers to energy system integration that would require to be addressed in your view?**

For direct electrification to be feasible, buildings will need modern and strong electrical systems. Currently, many European houses are fitted with electrical systems and wiring that is too old and obsolete to be able to accommodate all the electric technologies and unlock their efficiency potential.

While energy efficiency renovations are important to decarbonise buildings, electric renovations are paramount to enable sector integration. The upcoming Renovation Wave strategy should make the most of the proposed investments and address the electrical systems in the context of deep renovations. As the “forgotten building system”, home-



owners prefer to renovate other, more apparent and comfort-related features of their houses, instead of redoing the wiring. The latter is indeed costly and disruptive (as it requires opening the walls), without bringing added value that is obviously visible to consumers, who may fail to value the potential for sector integration and increased electrical safety. Without this, all of the benefits explained under question 1 will not materialise.

Further, electrical contractors have noticed a few other barriers:

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- Skills and workforce shortages: electrical installers across Europe report vacancies and full order books that cannot be filled due to a lack of professionals educated in green and digital fields. Up- and re-skilling opportunities are needed as well as more private sector involvement in education policies to ensure curricula are updated and relevant. The #Skills4Climate campaign has already been raising awareness on this issue.
- Interoperability of electrical and technical building installations, with Building Automation and Control Systems, is necessary to fully enable sector integration. Open protocols and standards are needed to ensure the installed devices and technologies are interoperable.

3. More specifically:

- **How could electricity drive increased decarbonisation in other sectors? In which other sectors do you see a key role for electricity use? What role should electrification play in the integrated energy system?**

Electrification is the main solution to reduce GHG emissions. Electricity is a zero-emissions energy carrier for end uses and can now easily and cost-effectively be generated from renewable and emissions-free sources. Further, this power can be generated in a centralised or distributed energy system. It is best to reduce emissions linked to climate change such as CO₂ and methane, but also to provide for a better air quality in urban centres, without local emissions (e.g. particulate matter, NO_x or SO_x).

For transport, direct electrification can offer viable solutions to cover significant portions of the sector. Battery-electric vehicles have the highest efficiency ratings and this technology has matured to cover most needs of individual consumers. Further, these electric vehicles (EVs) are a zero-emission solution for mobility but also for electricity grids and the integration of variable renewable electricity. Vehicle-to-grid (V2G) enables EVs to feed back power to the grid and be used for energy services. Coupled with solar PV, EVs will be able to store excess electricity directly and either use it for transport or for energy services, avoiding curtailment.

Heavy-duty transport will also soon be able to benefit from electric powertrains and new technologies such as dynamic charging and electric road will enable seamless zero-



emission travel for goods and persons across the EU. Finally, the maritime sector can also be electrified to a certain extent. The EU Green Deal already highlights this potential to curb the local emissions and improve air quality in coastal cities by mentioning the will to “oblige docked ships to use shore-side electricity”. Finally, electric solutions are already in place for short-sea shipping and ferries, as enabled by the H2020 E-Ferry project.

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These two sectors will indeed benefit from local renewable power and the latter will benefit from them, highlighting the synergy between electricity production and consumption.

- **What role should hydrogen play and how its development and deployment could be supported by the EU?**

Green hydrogen, or indirect electrification, is far from the most efficient solution, requiring more electricity than direct electrification where the latter is possible. It should be kept for hard to abate sectors where the aforementioned direct electrification solutions are impossible.

For instance, long-haul road transport, deep-sea shipping or heavy industry have energy needs that can not be met with direct electrification. Such sectors will rely on hydrogen to have access to a zero-emission solution. In order to ensure the needed hydrogen is available for the sectors that cannot turn elsewhere, sectors that can run on electricity should not divert the renewable gas from those that really need it.

The best case for green hydrogen production is when it is created during times of excess renewable generation (from wind farms for example) which cannot be fed into the grid.

Blue hydrogen is not a zero-emission energy carrier and is based on fossil fuels, and should not be incentivised in view of climate neutrality objectives.

- **How could circular economy and the use of waste heat and other waste resources play a greater role in the integrated energy system? What concrete actions would you suggest to achieve this?**

The transition to a circular economy is not just about adjustments that will reduce the negative impacts of a traditional linear economy. It also represents a system change that allows economic growth as well as environmental benefits. Electrical contractors can facilitate better utilisation and management of all buildings, infrastructure and other facilities we already have through digitalisation and electrification.

- **How can energy markets contribute to a more integrated energy system?**

Energy markets need to send the correct price signals to incentivise and take full advantage of the flexibility offered by EVs, heat-pumps and other demand response solutions.



- **How can cost-efficient use and development of energy infrastructure and digitalisation enable an integration of the energy system?**

The case of e-mobility would be strongly bolstered with a more comprehensive public charging network. The upcoming revision of the Alternative Fuels Infrastructure Directive (AFID) is the opportunity to mandate the installation of charging stations across the EU, and bring forward the objectives for TEN-T core network coverage. Further, V2G should be incentives and deployed widely to accompany the development of electro-mobility in the energy system.

Additionally, more renewable power generation is needed across the EU. While some member states are well endowed with natural resources making renewable generation easily cost-effective, others need support to swiftly rollout renewable generation capacity. The latter has the benefit of being versatile enough for both centralised and distributed deployment strategies. The upcoming Renovation Wave initiative should thus support the deployment of renewables in buildings.

Further, incentivizing the use of digital processes such as Building Information Modelling (BIM) would lead to more efficiency in the construction phase but also later, allow for energy analysis and predictive maintenance, leading to more longevity of installations. Finally, they go hand in hand with a flexible energy system based on renewable energy sources.

1. **Are there any best practices or concrete projects for an integrated energy system you would like to highlight?**

For e-mobility, several V2G trials and projects have been conclusive and real-world applications are starting to see the light of day.

For electric maritime transport, the Horizon 2020 project “E-Ferry” demonstrated a 100% electric, emission free, medium sized ferry for passengers and cars, trucks and cargo¹ in full-scale operation on longer distances than previously seen.

2. **What policy actions and legislative measures could the Commission take to foster an integration of the energy system?**

The upcoming Renovation wave will be paramount to ensure that our buildings are capable of enabling sector integration and for the prosumer model take root, leading to more consumer empowerment in the energy transition. Electrical systems need to be renovated in order to make electrification of new sectors a reality and this initiative is the best opportunity for the EU to address these shortcomings.

Skills and training will increasingly become an issue as the green economy develops and as demand further grows for clean and digital solutions. Again, the Renovation Wave aims at tackling skills shortages and green and digital energy skills should be addressed.

The upcoming AFID revision, will be the opportunity to mandate the installation of charging stations, needed for the consumer acceptance of this zero-emission technology. The last version was too weak as it did not feature any binding targets for infrastructure deployment. Further, the new AFID could complement the Energy Performance of Buildings Directive, which did have e-mobility provisions, albeit weak ones. A better framework for charging in buildings is needed to reap the sector integration benefits of e-mobility.

