ene.field national dissemination workshop – Belgium

Findings & policy recommendations

The Belgian national ene.field workshop, held on the 27th of September near Brussels, was the second in a series of national events aimed to inform participants about the ene.field project[1] findings and the potential of fuel cell micro-CHP technologies for the energy transition at national level. The workshop participants, representing the fuel cells industry, the research community as well as EU policymakers, identified the existing challenges and made policy recommendations for the **large scale deployment of fuel cell micro-CHP technologies in Belgium**.

Opening the workshop, ***Mr. Bart Biebuyck, Executive Director of the Fuel Cell and Hydrogen Joint Undertaking***, stressed that the FCH JU is strongly committed to accelerating the development towards large scale deployment of fuel cell micro-CHP, as fuel cells and hydrogen technologies will deliver energy security, competitiveness and sustainability. National and regional authorities should thus support the EU efforts by showing high level political commitment to an energy transition that takes advance of a range of technologies, including fuel cell micro-CHP. Mr. Biebuyck also highlighted the exemplary role that public authorities can play by installing fuel cell micro-CHP technologies in public buildings.

The potential of fuel cells m-CHP technology for the energy transition in Belgium and the EU

Speaking on behalf of COGEN Europe, ***Ms. Alexandra Tudoroiu-Lakavice*** highlighted the key role of **fuel cell micro-CHP products for improving the energy efficiency of the building stock in Europe, while reducing GHG emissions and helping to stabilize the electricity grids**. The ene.field project has enabled the industry to gain valuable insights from installing units in homes across Europe, which can be further explored and implemented as part of the FCH JU co-funded PACE project – the follow-up to ene.field. PACE stands for Pathway to a Competitive European FC mCHP Market and wishes to reach its objective through further reductions in product cost to enable FC micro-CHP competitiveness, improvements in performance in order to increase efficiency and the establishment of an appropriate policy framework. As Belgium is one of the four target countries in PACE, the project will help build the market for fuel cell micro-CHP in Belgium and provide the evidence base needed for a supportive policy framework at the national and regional level.

[1] The ene.field project is the largest European demonstration project of the latest smart energy solution for private homes, micro-CHP. It will see up to 1,000 households across Europe able to experience the benefits of this new energy solution. The five-year project uses modern fuel cell technology to produce heat and electricity in households and empowers them in their electricity and heat choices. The ene.field project is co-funded by the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) and brings together 27 partners, including 11 European manufacturers who will make the products available across 11 European countries.

Mr. Jan-Willem Tolkamp, representing SOLIDpower, opened his presentation by praising **the benefits of fuel cells micro-CHP**, such as primary energy savings and CO_2 emissions reductions, nearly eliminating NO_x and SO_x, which can significantly contribute towards Belgium's energy transition objectives.
Just as importantly, **fuel cell micro-CHP represent the missing link next to the renewables in the energy transition**. Today fuel cells are dispatchable, aggregated, cleantech generating assets and can thus increase the amount of renewables that can be connected to the grid; secondly they can operate with renewable fuels (biogas, Power to Gas) and will thus be fully renewable by 2050; thirdly they are reversible, therefore they can store renewable energy and enable full decarbonisation; last but not least, they work also when sun and wind are not available. Mr. Tolkamp also touched upon product cost reductions required for fuel cells to reach mass market, which are directly linked to scaling up production. Nevertheless, reaching large volumes require stable and favorable market conditions, government regulation, general trust and recognition of fuel cells technology, bankability and new business models.

During her presentation, ***Ms. Joni Rossi, Technical & Scientific Officer, COGEN Vlaanderen,*** presented the outcomes of a COGEN Vlaanderen study on fuel cells technologies, highlighting the **advantages** as well as the risks that fuel cell micro-CHP products are facing at this early commercialization stage.
From a policy perspective, fuel cells encounter both opportunities and barriers, which should be addressed in order to reap their benefits. Namely, it is of strategic importance to raise awareness among policymakers and to simplify the complex certificates support. Moreover, the primary energy savings realised by fuel cell CHP are not fully accounted for in the current EPB methodology, a.o. due to a lower primary energy factor for CHP (1.8) than for other technologies (2.5).

Setting up a comprehensive framework for the deployment of fuel cell micro-CHP in Belgium

The workshop panel, comprised of Mr. Biebuyck (FCH JU), Ms. Rossi (COGEN Vlaanderen), Ms. Tudoroiu (COGEN Europe), Mr. Van den Eynde (Viessmann), Mr. Van Haver (Spirit Group) and moderated by Mr. Jon Jordan (Hyer), agreed that the large scale uptake of fuel cell micro-CHP technologies in Belgium and on the European market, the **development of a comprehensive policy framework** is necessary.

- High-level recognition of the environmental and energy security contribution of fuel cell micro-CHP technologies towards the Belgian energy transition is key for the successful mass commercialization of these products in Belgium.

- As long as these fuel cell micro-CHP products can deliver system wide benefits in terms of primary energy savings, GHG (including CO2, NOx, SOx) reductions, RES integration, adequate support schemes should be designed to reward these technologies and facilitate their mass market uptake.

- Addressing **non-economic and administrative barriers** is also necessary in order to prevent further cost being incurred in early commercialisation. One such example is recognising fuel cells as eligible under the EPB methodology, which is time consuming and very costly for this emerging technology. Further **harmonization of standards and requirements between the three Belgian regions** would also be beneficial.

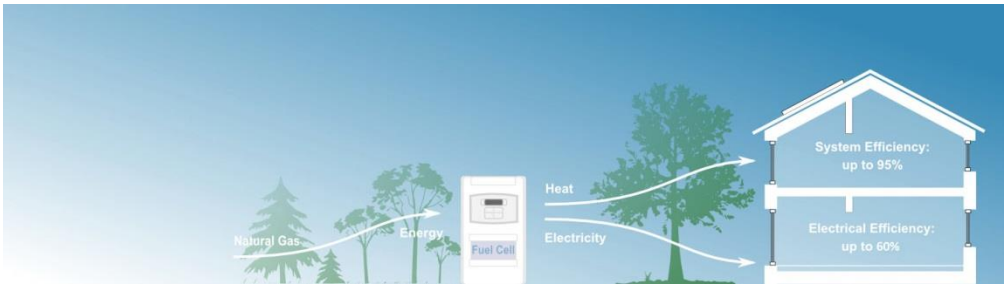
- **Partnerships between industry, policymakers and customers** are essential for the promotion of fuel cells micro-CHP in Belgium. The panelists agreed that manufacturers should address customer needs by delivering tailored solutions to the end-users. In addition to recognising fuel cell micro-CHP as one of the key technologies to deliver the energy transition in Belgium by addressing the barriers and providing sufficient support, public authorities themselves can give a boost to the industry by investing in these innovative technologies.

- Having more engagement by the equipment manufacturers and the whole supply chain will also lead to a more dynamic market in Belgium.

The technical potential for fuel cell micro-CHP technologies in Belgium has been assessed by COGEN Vlaanderen at 200,000 units by 2030[2]. Belgium should thus not miss the opportunity of reaping the benefits from the large scale deployment of these products.

[2] http://www.cogenvlaanderen.be/beheer/uploads/cogen_vlaanderen_-_nota_brandstofcel_wkk(1).pdf

Key facts about fuel cell micro-CHP



- Fuel cell micro – combined heat and power, or fuel cell micro-CHP for short, is a technology that uses a single fuel (hydrogen, natural gas or LPG) to produce both heat (for heating, hot water and/or cooling) and electricity for a building.
- The fuel cell works by combining hydrogen produced from the fuel and oxygen from the air to produce dc power, water, and heat.
- Reaching **total efficiencies of over 90% and electrical efficiencies of up to 60%**, fuel cell micro-CHPs represent one of the next generation solutions for the replacement of condensing-gas boilers in much of the built environment and a viable alternative for new buildings. Recent estimates, based on the technical performance of an average fuel cell micro-CHP unit, show that installing a fuel cell micro-CHP in an existing family home **will reduce primary energy consumption by at least 24%**[3].
- The primary energy savings translate into important CO_2 emission savings. A **fuel cell micro-CHP will reduce CO_2 emissions by 33% already today**, while attributable emissions of pollutants such as NO_x and SO_x could be virtually eliminated[4].
- On-site electricity production and self-consumption can **help support the grid and integrate intermittent generation of electricity from renewables**. For example, a fuel cell micro-CHP unit can efficiently generate electricity during peak heat demand periods, thus supplying the necessary power that heat pumps demand while reducing the need for grid reinforcements[5].
- Fuel cell micro-CHP remains a **viable and reliable solution to decarbonise the heating sector in the future**, thanks to its versatility and integration capabilities. The technology is **ready to run on carbon-neutral biogas, green hydrogen and to be combined with power-to-gas technologies**.
- **Fuel cell technologies are reversible, so they can store renewable energy**, supporting the transition to de-carbonisation

[3] The Roland Berger Study estimates that a fuel cell micro-CHP solution would consume overall 24% less primary energy when compared to a condensing boiler and electricity from a conventional power plant. Given that around 80% of Europe's individual heating systems consist of non-condensing boilers, more substantial savings should be expected as the old inefficient boiler stock is being replaced. Roland Berger, March 2015: Advancing Europe's Energy Systems: Stationary Fuel Cells in Distributed Generation, page 26.

[4] Based on Roland Berger Study. Detailed benchmarking on CO_2 and NO_x on page 29

[5] Both ene.field and PACE projects will estimate the reduced operational grid costs and avoided or delayed grid capacity investments associated with the higher penetration of fuel cell micro-CHP technologies.

Conclusions

ene.field and PACE projects, both co-funded by the industry and the Fuel Cell and Hydrogen Joint Undertaking (FCH JU), have embarked on an ambitious programme to install and monitor thousands of fuel cell micro-CHP units under different climate conditions throughout Europe. **In Belgium, the ene.field project has already installed 21 fuel cell micro-CHP units. As Belgium is one of the PACE project target countries, the follow-up activities expected in PACE will represent a step up in ambition**.

The industry is committed to deliver the fuel cell micro-CHP products to consumers, while cutting down costs and aiming for even higher electrical and total efficiency for their technologies. For the successful FC micro-CHP market entry, however, industry efforts need to be complemented by high level political commitment. Addressing administrative and other non-economic barriers is key to encourage the adoption of such innovative technologies.

To conclude, fuel cell micro-CHP **solutions are ready to enter consumers' homes, enabling householders to efficiently produce their own heat and power, thus reducing their energy bills and environmental footprint.** In order to realise the potential of fuel cell micro-CHP, however, there is a need for a **clear vision on policy and market development in Belgium**. This will ensure that European manufacturers can bring product cost down, and reach mass commercialisation by scaling up production and create growth and jobs through innovation across Europe.

About ene.field

The ene.field project is the largest European demonstration project of the latest smart energy solution for private homes, micro-CHP. It will see up to 1,000 households across Europe able to experience the benefits of this new energy solution. The five-year project uses modern fuel cell technology to produce heat and electricity in households and empowers them in their electricity and heat choices.

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The ene.field partners are: