

# HyTrEc<sup>2</sup>

## Newsletter 2020



# HyTrEc2's dazzling Mid-Term Conference



The HyTrEc2 Mid-term Conference was one of the highlights of Scotland's First Hydrogen Festival which took place from 28th September to the 4th October 2019 in Aberdeen.

HyTrEc2 workshops took place during the "Hydrogen: A Business Opportunity in the North Sea Region" Conference, on Tuesday 1st October. The Festival's opening conference featured multiple inspiring speakers who are delivering hydrogen projects throughout the North Sea Region.

The HyTrEc2 workshops covered several topics that are being addressed as part of the HyTrEc2 project deliverables including:

- Opportunities for Off-Grid Houses with Hydrogen
- The Business Case for Hydrogen in Aberdeen
- Development of Technology to Assist Hydrogen Users
- Can Fuel Cells and Battery Technologies Ever Live in Harmony?
- Delivering Solar Powered Hydrogen Vehicles in Groningen

If you would like to view any of these presentations, they are available for downloading from our website.

The event filled the conference venue with around 260 delegates. The audience included many who are already involved in the hydrogen sector, as well as those who were either exploring potential business opportunities or new to the sector. The variety of interest of the audience was only matched by the diversity of nationalities, with delegates from the Baltic States and Japan, as well as those directly involved in HyTrEc2.

The overall conclusion from the final audience poll was that the word 'exciting' best described the day and their view on hydrogen! It is abundantly clear that hydrogen is being recognised by many across the North Sea Region as offering a real opportunity for a cleaner economy and that its longer-term potential can only be realised if enough brave regions follow the HyTrEc2 Partners and begin to develop and deploy hydrogen in real and meaningful applications.

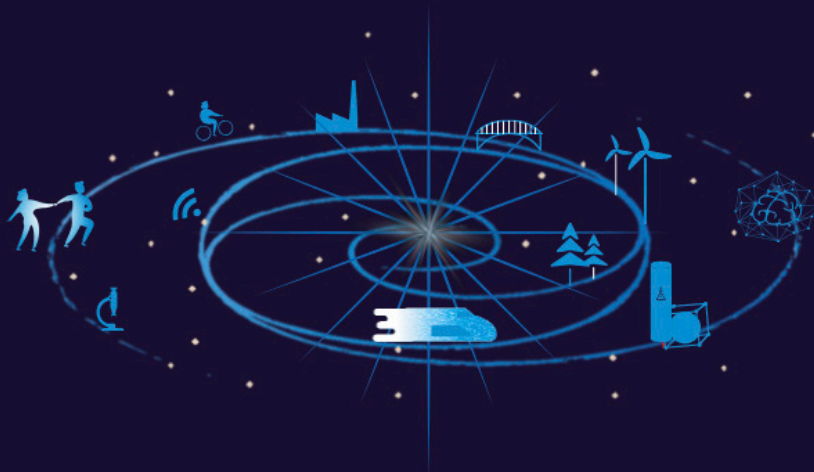
More details can be found here:

<https://northsearegion.eu/hytrec2/news/hytrec2-mid-term-conference-takes-part-in-scotland-s-first-hydrogen-festival/>



REGIO**STARS**

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# RegioStars Awards 2020: The Finals, what an honour!

HyTrEc2 made it to the Finals of the RegioStars Award 2020! RegioStars is an award that highlights European Union funded projects that inspire others with the innovative approaches to regional development.

The award has been running annually since 2008. The 2020 RegioStars award saw a record number of applications, with 206 projects submitting. Despite this tough competition HyTrEc2 has found itself a spot on the shortlist. HyTrEc2 project made it to the finals of this prestigious event and was recognised in the top 5 in the category: 'Smart Growth: Industrial transition for a smart Europe'.

Being shortlisted affirms all the years of hard work and collaboration that has gone into the project so far! A big thank you to all our lovely Partners for all their hard work. It is only through their dedication and determination to delivering a hydrogen future that this project has been so successful. The enthusiasm that Aberdeen, Aberdeenshire, Cenex, Drenthe, Eifi, Groningen, RISE, UiT and atene Kom have makes us feel more hopeful that we can achieve a cleaner, greener future!

More details can be found here:

<https://northsearegion.eu/hytre2/news/wish-you-were-here/>

<https://northsearegion.eu/hytrec2/news/hytrec2-is-a-regiostars-finalists/>



## Introduction of atene Kom

It is official, a new German partner is entering the HyTrEc2 project in the place the Elfl: The Agency for Communication, Organisation and Management, atene KOM, based in Berlin. HyTrEc2's newest Partner is a consultancy firm, which works in tandem with the public sector on large-scale projects. atene KOM chiefly focuses on bringing future technologies and infrastructure into rural areas, which makes them perfect to help us achieve our ambitions for Hydrogen in the North Sea Region!

atene KOM have thirteen years' experience in marketing; organising workshops; delivering training modules; and in project communication. In addition, they have unique hydrogen experience across Germany ranging from exploring nifty hydrogen storage solutions in Berlin to hydrogen production from water treatment along the river Emscher. From

their extensive project experience and their hydrogen insight we are certain that atene KOM are set to be a wonderful addition to our partnership! atene KOM will take an active outreach role within HyTrEc2. The company plans to host various hydrogen events in Germany which will facilitate business-to-business meetings. Furthermore, atene KOM intends to construct a hydrogen demonstration model which will be shown at such events to entice newcomers into the hydrogen sector. atene KOM also hope to develop a HyTrEc2 road trip across all partner regions (Covid-19 restriction dependent), to highlight the blossoming network of green hydrogen technology and associated hydrogen infrastructure.

Welcome, atene KOM, to the HyTrEc2 Team !

Information can be here: <https://northsearegion.eu/hytrec2/news/welcome-atene-kom/>

## Hydrogen Vehicles The Netherlands



Is there anything more quintessentially Dutch than bicycles along a canal?

Well, HyTrEc2 partners, Groningen and Drenthe, are doing their bit to make the sight of Fuel Cell Vehicles a staple of daily Dutch life!

2020 saw the introduction of four hydrogen fuel cell Hyundai Nexos to the Provincie of Drenthe's fleet. The new hydrogen cars will be used by the province's staff for business trips, ensuring they are promoting the energy transition with each outing.

The Province has big plans for a refuelling network, with 5 sites across the region lined up to be hydrogen

refueling stations: a hydrogen economy is really developing in the North Sea Region.

In addition, 2020 saw Gemeente Groningen add a new fuel cell waste truck their fleet, the first of two trucks the City will deploy as part of Hytrec2. The trucks will be used for waste collection in the city centre, and will aid Groningen to meet its ambitious target of being energy neutral by 2035. Groningen is planning to deploy more hydrogen vehicles with the experience gained from Hytrec2 helping to further finetune operations. With learning from this truck informing the Interreg North West Europe HECTOR project truck deployment and demonstrating HyTrEc2's ability to add further value by sharing knowledge of this young market.

Further information can be found here:

<https://northsearegion.eu/hytrec2/news/sneak-peek-of-the-future-in-drenthe/>

<https://northsearegion.eu/hytrec2/news/groningens-fuel-cell-waste-truck/>



## Scotland

This year, HyTrEc2 welcomed another bespoke vehicle to its fleet, a road-sweeper, which has proven to be such a success that Aberdeen City Council are seeking further sweeper conversions.

Willie Whyte, the fleet manager said, *'The sweeper's performance has been exceptional, and results show for city operation hydrogen is best.'*

The road-sweeper is a dual-fuel large vehicle, which operates on diesel and hydrogen. The sweeper shows the ingenuity and innovative nature of HyTrEc2, as it's a particularly unique example of Hydrogen integration: it is a large vehicle with two engines. In this model both the propulsion engine and the brushes engine have hydrogen incorporated, greatly reducing

emissions. From December 2019- October 2020 the inclusion of hydrogen allowed the road sweeper to save over 1300KGs of CO<sub>2</sub>e!

Further information can be found here:

<https://northsearegion.eu/hytrlec2/news/hytrlec2-road-sweeper-in-aberdeen-cutting-edge-dual-fuel-technology/>





# Hydrogen Heroes Scotland

It would be remiss to not mention the largest event of 2020 in this newsletter: The Covid-19 Pandemic. Hydrogen, like everything else, was impacted by subsequent restrictions. However, hydrogen also proved itself to be heroic in our hour of need. HyTrEc2 partners, Aberdeen and Aberdeenshire have a series of hydrogen vehicles being trialled by the public and community partners as well as by the authority staff themselves, these fuel cells vehicles helped to ease some of the difficulties caused by the pandemic in the North East Coast of Scotland.

In Spring 2020 the Community Pharmacy Delivery Scheme was established throughout Scotland in response to the COVID-19 pandemic; this led to local authority staff providing support to the National Health Service with the delivery of prescribed medication from local community pharmacies to people who were 'shielding' due to medical conditions during the pandemic 'lockdown' period. In Aberdeenshire the HyTrEc2 fuel cell Toyota was deployed by council staff for prescription deliveries across North East Scotland. The extra range and power provided by the hydrogen fuel cell was especially valuable, given the need for extensive travel covering some very rural roads all the way from the coast to deep in the Cairngorm mountain range. These tasks ensured that one of Aberdeenshire's HyTrEc2 cars passed the 15,000 Km mark in well under a year! Although the 'lockdown' period has since ended, and shielding has paused in the UK (at time of writing), the delivery service remained available for vulnerable individuals who have no other means of receiving their prescribed medication.

Also, an Aberdeen-based community food initiative, CFINE, relied on the HyTrEc2-funded hydrogen vehicle to distribute food to those most in need. The demand for food assistance rapidly stepped up during the onset of the pandemic, as some began 'shielding' and other faced increasing uncertain financial situations, thanks to the hydrogen car CFINE were able to continue their excellent work!

Learn more here:

<https://www.cfine.org/vegareonitoon-fruit-and-vegetable-box-delivery>

In addition, Co-wheels, the car sharing platform that HyTrEc2 has partnered with to provide hydrogen vehicles to public, slashed the price of rental for those who work in the National Health Service. That meant that despite reductions in available buses, key workers were still able to get to work. This came in tandem with Aberdeen receiving funding from Smarter Choices Smarter Places funding to subsidise the cost of hydrogen fuel, making our very glamorous hydrogen vehicles the cheapest vehicles to rent on the Car Club fleet.

Further details can be found here:

<https://northsearegion.eu/hytrec2/news/starupdate-further-reductions-in-pricestar-hydrogen-fuel-now-free-for-hytrec2-vehicles-in-aberdeen/>

## RISE

HyTrEc2 recognised the gap in the market that exists for hydrogen based heavy duty forklifts. A report was orchestrated by HyTrEc2 partner RISE, which used Simulink computer software to simulate a working day for a 5-9 tonne forklift. The findings of the modelling prove that hydrogen could be a hugely beneficial fuel for the heavy forklift industry, as it offers the possibility of productivity trebling.

The results have been disseminated around interested manufacturers and researchers, including at the Interreg Öresund-Kattegat-Skagerrak's Cleancon webinar on 3rd November 2020. It is hoped that the analysis of hydrogen integration into heavy forklifts carried out by HyTrEc2 can be carried forward by Cleancon to release clean construction machinery.

More information can be found here:

<https://northsearegion.eu/hytrec2/news/successful-forklift-simulation/>

<https://northsearegion.eu/hytrec2/news/working-together/>

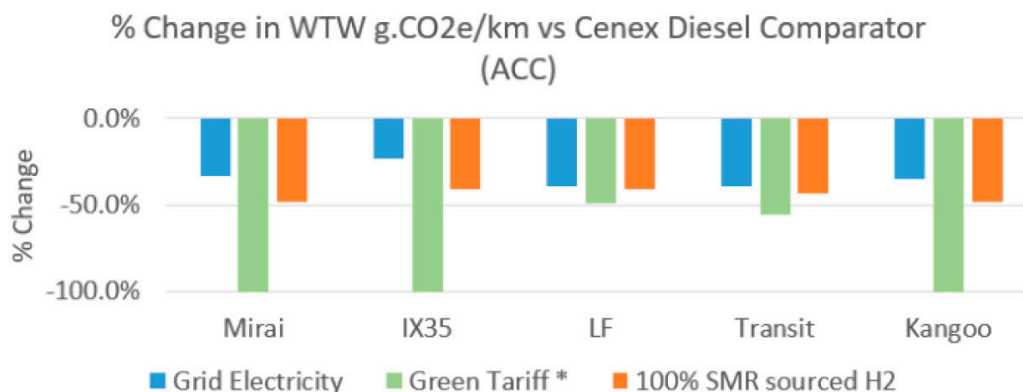
<https://interreg-oks.eu/projektbank/projekt/cleancon.5.3a616d8e16b527c1fd5e1a1.html>



# Cenex review Aberdeen City Council Vehicles' Well-to-Wheel Emissions



## Aberdeen City Council Vehicle Analysis - WTW



\*Green tariff carbon intensity (0g co2e/kWh) is direct emissions only. This does not account for renewable technology construction or maintenance (Real emissions would likely be 12-44 g co2e/kWh based on only renewables). Additionally, this excludes the need for energy balancing, such as storage, which will increase carbon intensity substantially in an energy mixture provided by EDFs green tariff.

The above graph shows the CO2 emissions from each vehicle type present in Aberdeen City Council fleet. The 0% represents the amount of CO2e an equivalent diesel vehicle would produce. The bars represent the percentage change of various forms of hydrogen: renewable hydrogen ('green' hydrogen produced electrolysis from renewables or off a green tariff), hydrogen produced from national grid powered electrolysis, and steam methane reformed hydrogen made with fossil fuel. Each type of hydrogen in every vehicle type delivers emissions savings; proving that hydrogen transport is better for the planet.

This data is a significant change from that reported in the last newsletter. The current analysis shows a significant improvement in the quality of grid hydrogen. The grid-based savings are due to the UK National Grid increasingly using renewables to generate electricity and having decommissioned several coal-fired power plants.

The largest savings are still being made by green hydrogen in fuel cell vehicles and range extended battery electrics as these are the most efficient at using hydrogen and rely on the fuel for most, if not all, of it driving. While the Transit and LF are both dual-fuel combustion engines running on hydrogen and diesel, which explains why the savings for these vehicles are not at the 100% level.

Further information about the previous data can be found here:

<https://northsearegion.eu/media/10937/hytrec2-2019news-single-pages.pdf>

More details about the project's emission savings can be found here:

<https://northsearegion.eu/hytrec2/news/hytrec2-emissions-savings-so-far/>

# University of Tromsø groundbreaking Hydrogen Refuelling Station



In an effort to ensure cheaper green hydrogen production, storage and distribution in rural North Sea Region areas, The Arctic University of Norway have begun work on a small Hydrogen Refuelling Station (HRS) set-up on site.

The UiT team are the leader of work package 5, which focuses on strengthening the supply chain and creating training. The creation of the HRS will help to galvanise the local hydrogen supply chain.

Furthermore, the intention is to use the station mainly as an educational tool. The practical training potential that the HRS holds will significantly advance the provision of study available: allowing the students to strengthen their technical understanding with practical examples. Thus, the HRS goes a far way to help advance work package 5.

In addition, this HRS offers the project an additional source of data to draw upon for work package 3 and 4. The station will create an opportunity to better understand the conditions of green hydrogen production and storage locally allowing the University the capacity to trial a hydrogen vehicle. This is exciting news, as the climate conditions in Narvik are far more extreme than other partners, so will offer an insight into the functionality of a hydrogen transport and refuelling in colder conditions.

More details and further updates can be found on the HyTrEc2 website: <https://northsearegion.eu/hytrrec2/>

## 5 Things to Look Forward to in the coming months:

- **NSR rules and regulations**
- **Further adoption of green hydrogen in large vehicles**
- **Completion of UiT Hydrogen Refuelling Station**
- **HyTrEc2 training modules**
- **The business case for green hydrogen**

**Interreg**  
North Sea Region  
HyTrEc2  
European Regional Development Fund



EUROPEAN UNION

**HyTrEc2**  
Hydrogen Transport Economy  
for the North Sea Region