



Decarbonizing the Gas Grid with Renewable Fuels: Lessons from Northern Europe

October 19 to 25, 2025

Updated 19 October

Welcome to Denmark! We are so excited to have you with us, and we hope that you become equally excited about the Danish way of building sustainability into almost every aspect of daily life.

Our only rules for the trip:

1. We leave exactly on time! We have a lot of ground to cover and want to be respectful of both our hosts and the other participants. This means if you miss a departure you will need to find your way to where we will be on your own. All departure times and addresses of our destinations are included in this itinerary.
2. We provide preselected wines for all group meals. If you would like to drink something different, such as a cocktail or an alternative wine, please let the wait staff know that you will be paying for that on your own.
3. Please let us know by early afternoon if you are not planning to join us at one of the group dinners. We want to be able to inform the restaurants in time so that good meals don't go to waste!

SUNDAY (19 October) - Copenhagen

Directions to our hotel: With a station right at the CPH airport, it's easy to catch the Metro. Buy a 3-zone ticket to center city at the self-serve DSB vending machines in the main terminal. Then take the elevator up to the Metro station, where you'll catch the M2 toward Vanløse Station. Trains depart every 6 minutes, so there's no need to run! Go eight stops (13 min.) to Kongens Nytorv Station. Once you're at Kongens Nytorv go up the two banks of escalators and keep walking in that direction until you see the Gade Street / Strøget exit. Take the stairs (or the elevator) up to street level, and with the Rolex sign behind you walk around Kongens Nytorv square toward the building with the large 1664 beer bottle sign. Nyhavn, a busy pedestrian-filled street alongside the canal, will then be to your right. Walk down

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Nyhavn, and then take a left where a bridge crosses the canal (on Toldbodgade). Our hotel, the Copenhagen Admiral Hotel, will be 1-1/2 blocks ahead, on your right. From Kongens Nytorv, it's about a 10 to 15-minute walk (1/2 mile).

Afternoon – Check into our hotel, Copenhagen Admiral Hotel

Address: Toldbodgade 24, 28, 1253 København K

King Christian IV founded the Nyhavn area to support the flourishing trade in the 1600s. The harbor was completed in 1673 as an alternative to the old port (the name Nyhavn was derived from "Den Nye Havn", the New Harbor) and for many years Nyhavn was a busy commercial port where ships from all over the world docked. The 1,500-foot-long canal in Nyhavn was constructed to make Denmark more competitive in the trade business by creating a waterway that led straight into Kongens Nytorv – the new upcoming city center of Copenhagen.



5.30p – Leave our hotel lobby to walk to the Restaurant ORANJE for our introductory meeting
Address: Nyhavn 65 a, 1051 Indre By

6.00p to 7.00p – Introductory meeting at Restaurant ORANJE

We'll provide some background on the goals of the trip, review the itinerary and rules, and do a quick round of introductions.

7.00p to 8.30p – Group welcome dinner at Restaurant ORANJE

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MONDAY (20 October) - Copenhagen

8.45a – Leave the hotel lobby for a 30 min walk down the Strøget to our morning meetings

Address: State of Green – Vesterbrogade 1E, 1620 København

9.30a to 11.00a – Series of meetings at State of Green

This is a locked facility. You must be at the front door with the group by 9.25a to be let in for our meetings.

9.30a to 10.00a – State of Green: Denmark's Green Transition

State of Green is a not-for-profit, public-private partnership that seeks to foster relations with international stakeholders. This presentation will provide an introduction to Danish perspectives on the role of renewable energy and renewable fuels, with an emphasis on how Danish companies and solutions are allowing the nation to decarbonize the energy sector while achieving economic growth.

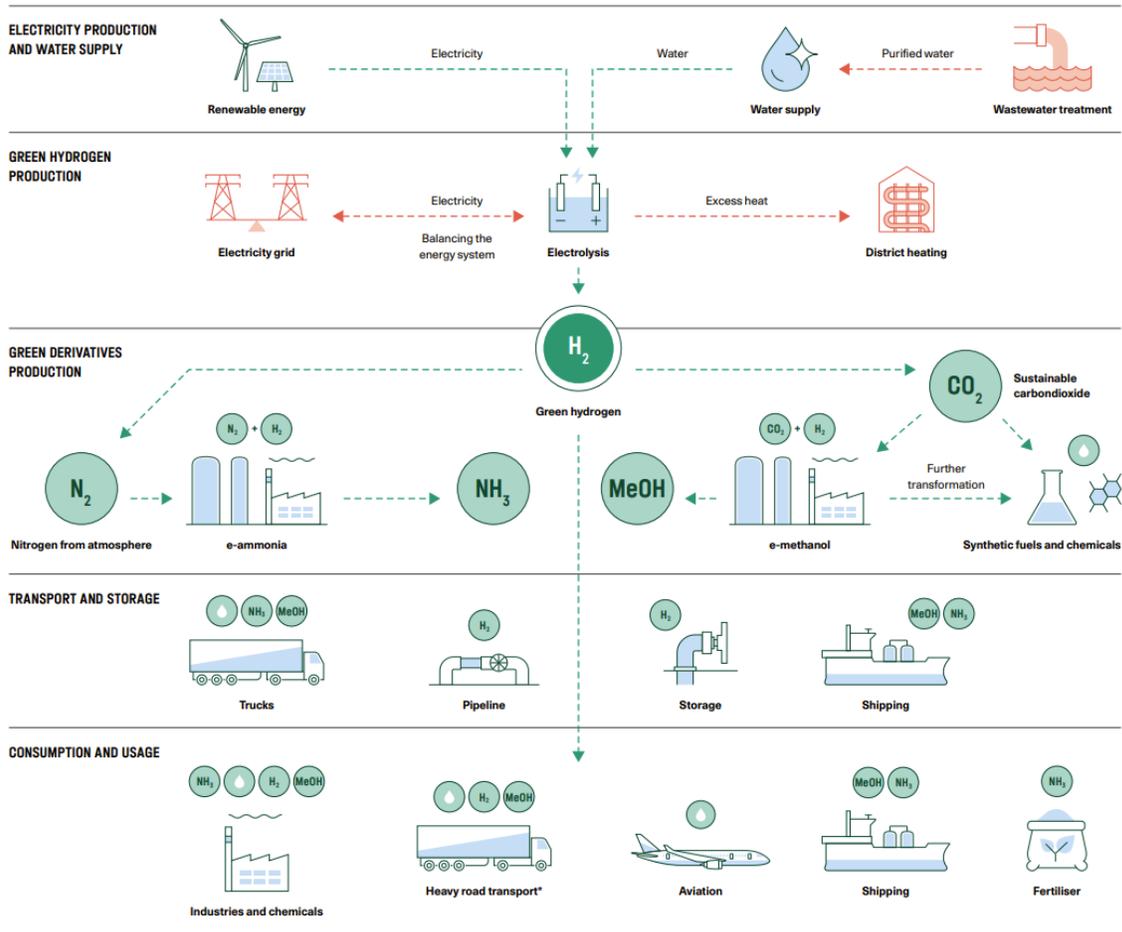
10.00a to 11.00a –Danish Energy Agency: Biogas, PtX and Green Hydrogen Initiatives

The Danish Energy Agency, established in 1975, is an agency of the Danish Ministry of Energy, Utilities and Climate and Energy. It is responsible for activities related to energy production, supply and consumption, as well as Danish efforts to reduce carbon emissions. This includes responsibility for the regulations regarding government subsidies and other support for sustainable biogas and hydrogen production. The Agency will discuss how the government's policies have accelerated the growing biogas economy, and will provide an overview of climate goals and government policies related to green hydrogen production through Power to X (PtX).

Biogas (also referred to as RNG) is a methane-containing gas produced during the anaerobic decomposition of organic residues and waste products. It plays an important role in the green transition, as it can be upgraded to biomethane which can directly replace the use of fossil natural gas. The share of biogas in the Danish gas system was almost 40 percent in 2023, and by 2030, Denmark aims to rely 100% on green gas (both biomethane and biogas).

PtX covers several technologies, all of which are based on converting water into hydrogen through electrolysis. The hydrogen can then be combined with nitrogen or CO₂ to produce green e-fuels such as ammonia, methanol or kerosene. The Danish Energy Agency views PtX as an important piece in meeting the government's goal of climate neutrality by 2045, as PtX fuels can be used to serve energy intensive sectors that are historically challenging to electrify - such as heavy industries like steel manufacturing or cement production; aviation and maritime transport; and agriculture.

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11.00a to 11.15a – Travel by bus to our lunch restaurant in Nordhavn

Address: Wulff & Konstali – Århusgade 130, 2150 København

11.30a to 12.30p – Lunch at Wulff & Konstali



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*12.30p to 12.45p – Walk to Bjarke Ingels Group (BIG) headquarters**Address: Sundkaj 165, 2150 København*

It's a very pleasant 0.5 mile walk to BIG, but the bus will be available for anyone who prefers not to walk.

12.45p to 2.00p – Ground source heating and cooling at BIG

Ground source heating and cooling systems (geothermal systems) take advantage of the relatively constant temperatures beneath the earth's surface - this constant earth temperature is higher than average winter temperatures, and lower than average summer temperatures. At the BIG headquarters building a Pile Thermal Energy System (PTES), designed by Energy Machines, uses energy piles to transfer the ground temperature to the heat pumps that serve the building's heating and cooling system. Energy piles are specially manufactured concrete foundation piles equipped with energy storage capabilities. BIG's 50,000 sf headquarters stands on 222 energy piles, each about 50 feet deep. With this system, 84% of the building's heating and 100% of cooling is derived from renewable energy.

*2.00p to 2.30p – Travel by bus to Dansk Metal**Address: Molestien 7, 2450 København SV**2.30p to 4.00p – Meeting with Dansk Metal*

Dansk Metal is the union that represents the metal workers in Denmark, with workers in automotive, IT, telecommunications, construction, aviation, and other industries. Dansk Metal is also building new homes – including student and dormitory housing, as well as apartments – at the Sydporten in Copenhagen, where members of Dansk Metal have the first right to rent. The union represents many of the workers who are key to the growth of the green economy in Denmark. We will be hearing about their initiatives to provide training and workforce development for these critical skills. In May of 2025 Dansk Metals president Claus Jensen was announced as the most influential person in Denmark, illustrating the important role that labor unions play in Denmark.



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4.00p to 4.30p – Travel by bus to Bryggerens, in the Old Carlsberg District

Address: Bag Elefanterne 20, 1799 København

4.30p to 5.30p – Happy hour at Bryggerens. Danish labor representatives from Dansk Metal will be joining us.

Beer, nachos and conversation over happy hour. Dinner tonight is on your own. The bus will return to our hotel at 5.45p, so you can take that back or arrange for your own transportation after dinner.

5.45p – Our bus will leave to go back to our hotel with anyone who is ready to return.

TUESDAY (21 October) – Copenhagen to Flensburg

8.00a – Make sure you are checked out of your room and your bags are on the bus.

You must be wearing closed-toe shoes today for the afternoon site visit!

8.15a to 8.45a – Take our bus at 8.30a, or leave at 8.15a to enjoy a 30-minute walk along the waterfront

Address: BLOXHUB, Athens Meeting Room – Bryghuspladsen 8, 1473 København

9.00a to 10.30a – Meeting with Energinet

As the Danish national transmission system operator, Energinet owns, operates and develops the transmission systems for both electricity and natural gas in Denmark. The presentation will provide an introduction to Energinet and an update on the business case for hydrogen, including a look at tariffs, subsidies, and the levelized cost and competitiveness for green hydrogen.

This year the Danish government agreed to provide Energinet almost \$2.5 billion in financial support to construct and operate a hydrogen pipeline from the west coast of Denmark to Germany, with a target completion date of 2030. The project combines new hydrogen pipes on some portions of the route with the reuse of existing natural gas pipes in other areas. The Danish Hydrogen Backbone is an important part of the transition to green energy and will eventually connect Denmark to a European hydrogen grid.

10.30a to 1.00p – Travel by bus to Fredericia

1.00p to 2.45p – Group lunch in Fredericia, with lunch presentation on the HySynergy Phase II PtX plant

Address: Hotel Kryb I Ly Kro – Kolding Landevej 160, 7000 Fredericia, Denmark

The HySynergy Power-to-X plant, in Fredericia, is one of Europe's largest Power-to-X plants with an initial electrolyzer capacity of 20 MW and expected expansions to 300 MW and 1 GW. The Phase 1 electrolyzer contributes to significant decarbonization of industrial processes at the adjacent

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Crossbridge Energy Refinery. HySynergy will also offer a competitive supply of green hydrogen as zero-emission fuel for heavy-duty mobility. Further expansion plans include the development of additional green hydrogen production capacities in Denmark to supply industrial demand in Germany, through the EU Hydrogen Backbone.

If our lunch and presentation end early you can take some time to enjoy the beautiful grounds of the hotel.

2.45p to 4.00p – Travel by bus to the Glansager biogas plant

Address: Shell Glansager Biogas – Glansager 4C. DK-6400 Sønderborg

4.00p to 5.30p – Tour of the Glansager biogas plant

Shell's biogas plant in Glansager is the first in the world to commercially increase the production of biogas via electrolysis and biological methanation. An electrolyzer plant converts excess electricity from the sun and wind into hydrogen that is fed into Shell's methanation plant where it is combined with CO₂ to form e-methane, thereby increasing biogas production from the existing biogas plant and reducing the amount of CO₂ released.



Shell
Low Carbon Solutions

Biogas

5.30p to 6.30p – Travel by bus to Hotel Hafen

Address: Schiffbrücke 33, 24939 Flensburg, Germany

7.00p to 8.30p – Group dinner at Hansens Brauerei

Address: Schiffbrücke 16, 24939 Flensburg, Germany

The restaurant is a two-minute walk from our hotel. Guests are invited!

Flensburg was developed as a trading port in 1284 during the Middle Ages because of its location on the Flensburg Fjord which connects to the Baltic Sea. Near the Danish border, Flensburg is a compact German port city known for its historic old town, maritime museums, and waterfront cafés. Visitors enjoy exploring the harbor and walking through well-preserved merchant courtyards.

WEDNESDAY (22 Oct) – Flensburg to Groningen

8.45a – Make sure you are checked out of your room, and your bags are on the bus. We will have a long bus ride today, so it's a good idea to keep out anything you might want to access to catch up on work or reading. There is no Wi-Fi on the bus.

9.00a to 10.45a – Travel by bus to the Hamburg Expo Center

Address: Hamburg Exhibition Hall and Congress, Messepl. 1, 20357 Hamburg, Germany

11.00a to 3.00p – Hydrogen Technology Conference & Expo Europe 2025

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This international conference and expo event focuses on advanced technologies for the hydrogen and fuel cell industry, covering the entire hydrogen value chain. It will feature a vendor exhibition and a large conference including over 300 speakers and is projected to attract over 20,000 attendees.

All participants will receive VIP passes that give you full access to the expo, all speaker sessions, and lunch. Please have a printed copy of your pass with you, or have it available on your phone, so we can go through the FastPass lane. Other than the activities listed below, you are free to spend your time at the conference as you choose. As our time there is limited, we suggest you review the [conference schedule](#) before we arrive to see if there are sessions you may want to attend, or vendors you wish to meet with.

12.15 to 1.15p – Group lunch at the Low Carbon Hydrogen Production track networking lunch

Groningen and the Hydrogen Transition

We will split into two smaller groups. Please meet at the Groningen Hydrogen Valley booth near the entrance to the Expo Hall (Hall B6, Stand 6J15) at your designated time for a presentation by the New Energy Coalition and an introduction to the HEAVENN project.

1.30p to 2.15p – Group A meets at the Groningen Hydrogen Valley booth

2.15p to 3.00p – Group B meets at the Groningen Hydrogen Valley booth

Groningen, located in the northern Netherlands, sits atop Europe's largest natural gas reserve, which has long served as a primary energy source for the Netherlands and much of Western Europe. Historically, the region was one of Europe's most important centers for natural gas production and distribution. However, as the Netherlands phases out natural gas production, existing extraction and purification facilities are being decommissioned.

In response, the region has committed to becoming the *Green Hydrogen Capital of Europe*, driving the transition from gray to blue and ultimately to green hydrogen in production, distribution, and utilization. Leading this effort, the New Energy Coalition coordinates the HEAVENN project, which established the Hydrogen Valley in the northern Netherlands. The Coalition is also exploring opportunities to repurpose existing natural gas infrastructure to create sustainable energy hubs.

2.20p to 2.45p (OPTIONAL) –those interested in potential opportunities for hydrogen use within aviation may want to attend the conference session “Hydrogen Aviation Research at ZAL TechCenter in Hamburg”

3.20p – Make sure you have made your way back to the bus and are ready to roll for our departure!

3.30p to 5.30p – Travel by bus to Oldenburg

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5.30p to 7.00p – Dinner on your own in Oldenburg

We will stop in the downtown core of this quaint German city, where you will find several restaurants to choose from for your dinner.

7.00p to 8.30p – Continue by bus to our hotel in Groningen

Address: The Market Hotel Groningen– Grote Markt 31, 9712 HS Groningen

Groningen is a vibrant university city known for its youthful energy and rich culture. Visitors love exploring the historic city center with its Martinitoren tower, charming canals, and lively markets. The city combines classic Dutch architecture with modern design, like the striking Groninger Museum. With its bike-friendly streets, cozy cafés, and active arts scene, Groningen offers a perfect mix of tradition and contemporary urban life — all within easy walking distance.

THURSDAY (23 Oct) – Groningen

We will be staying at our hotel for a second night, so you do not need to check out or pack your bags today!

8.15a to 9.00a – Travel by bus to Groningen Seaports

Address: Nijlicht, Schildweg 16, Eemshaven

9.00a to 10.30a – Groningen Seaports

Groningen Seaports operates an industrial H₂ pipeline “ring” system feeding output from the Nobian chlor-alkali facility to existing industrial customers. Green hydrogen will be used for the production of green methanol (20 MW) and the production of green kerosene (40 MW). A trailer outlet is being completed, enabling green hydrogen to be loaded onto trailers and transported to users in the region, and a hydrogen-powered barge with a hydrogen fuel cell emergency power supply demonstrates a zero-emission shore-based power supply.



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10.30a to 12.00p – Travel by bus to our lunch in Hoogeveen

Address: Narline – Hoogeveenseweg 17, 7921 PC Zuidwolde, Netherlands

12.00p to 1.20p – Lunch at Narline

1.20p to 1.30p - Travel by bus to the Hoogeveen Hydrogen District

Address: Zuidwoldigerweg 52, 7908 AD Hoogeveen

1.30p to 3.30p – Tour the Hoogeveen Hydrogen District

The Municipality of Hoogeveen is developing 100 new homes that will rely on a 100% hydrogen supply, and converting more than 400 existing homes from natural gas to hydrogen. The project will reuse portions of the existing natural gas network and deploy a new hydrogen central heating boiler, to show the role that green hydrogen can play in serving the Dutch housing stock. In addition, a data center is being fitted with an emergency power supply that uses a hydrogen fuel cell. If this proves to be effective, it will demonstrate how fuel cells can provide data centers with a reliable electricity supply even when the electricity grid is constrained.

3.30p to 4.15p – Travel by bus to our hotel in Groningen

Address: The Market Hotel Groningen– Grote Markt 31, 9712 HS Groningen

6.00p to 7.30p – Group dinner at Smoke

Address: Smoke – Grote Markt 21a, 9712 HR Groningen

Our restaurant is just a short two block walk from the hotel.

FRIDAY (24 Oct) – Groningen to Amsterdam

8.30a – Make sure you are checked out of your room, and your bags are on the bus.

8.45a to 9.00a – Travel by bus to DNV Technology Center

Address: Plus Ultra Groningen - Zernikelaan 14, 9747 AA Groningen (Zernike Campus)

9.00a to 10.30a – DNV Technology Center

The specialists at DNV’s Technology Centre in Groningen have strong capabilities within a broad range of fuel types including renewables such as biogas, hydrogen and (bio-)LNG. The Centre works on the full-scale implementation of hydrogen as a fuel for industries and households and assists clients in understanding the challenges when converting pipelines, distribution infrastructure and end use equipment such as burners, engines and domestic appliances from natural gas to hydrogen.

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10.30a to 11.00a – Travel by bus to Gasunie

Address: Concourslaan 17, 9727 KC Groningen



11.00a to 12.30p – Meeting at Gasunie

Gasunie is a major gas distribution utility in the Netherlands and the northern part of Germany, and is responsible for managing and maintaining the infrastructure for large-scale transport and storage of gas. Although currently this network is primarily serving natural gas, Gasunie is now developing a national hydrogen network, with an initial focus on connecting industrial clusters and facilitating both onshore and offshore hydrogen transport. The company is also involved in international connections and aims to establish the Netherlands as a key hydrogen hub. The Ministry of Economic Affairs and Climate commissioned Gasunie to build a network to ensure that industry has access to hydrogen as a cleaner form of energy. Gasunie subsidiary Hynetwork will be converting around 80 miles of natural gas pipeline and laying another 50 miles of new pipeline, with work expected to be completed by the end of 2027.

The presentation will focus on the development and challenges in building out a hydrogen network, and will highlight some of Gasunie's projects related to hydrogen import, hydrogen storage, and offshore hydrogen.

1.00p to 1.30p – Lunch at Gasunie

Address: In our meeting room at Gasunie

1.45p to 4.00p – Travel by bus to our hotel in Zaandam

Address: Inntel Hotels Amsterdam – Provincialeweg 102, 1506 MD Zaandam

5.30p – Leave from the hotel for a 20-minute walk to Restaurant Castell Zaandam

6.00p to 7.00p – Mandatory debrief meeting at Restaurant Castell Zaandam

Address: Zuiddijk 2, 1501 CA Zaandam

We'll use this time to discuss what we saw during the week, its significance, its relevance to our own region, and potential next steps.

7.00p – Farewell group dinner at Restaurant Castell Zaandam

Address: Zuiddijk 2, 1501 CA Zaandam

Guests are welcome to join us at 7.00p for dinner.

SATURDAY (25 Oct) - Departure

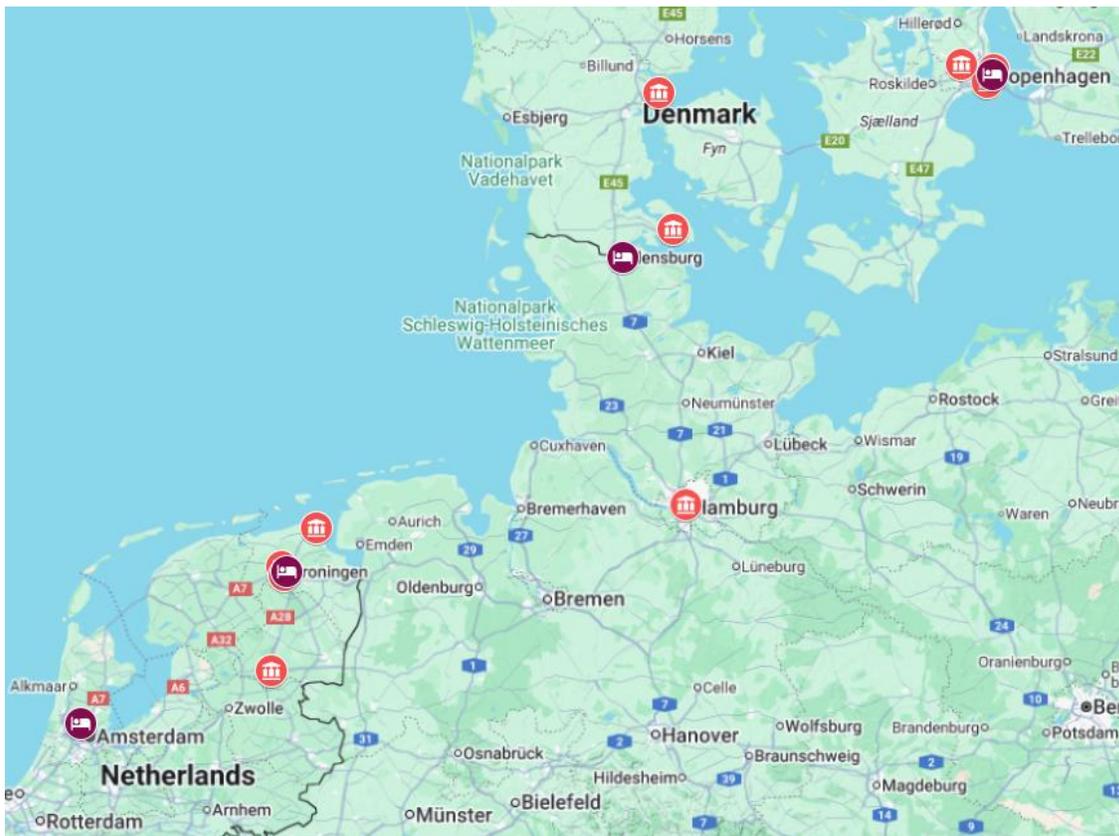
Our i-SUSTAIN program is over!

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The easiest way to get to Schipol Airport is to walk to the main train station, about 10 minutes away, and then take the non-stop Sprinter, which runs about every half hour and takes 26 minutes.

For those who will be spending some extra time in this vibrant city, Amsterdam will be pulling out all the stops on Oct 27 to celebrate 750 years since the city received its official city rights in 1275, with 24-hour neighborhood festivals and a nine-mile-long street party.

Click [here](#) to go to an interactive, on-line map with labels for all the places we will be visiting.



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