



PROSPERITY FROM SUSTAINABLE INFRASTRUCTURE AND ENERGY
DELEGATION TO DENMARK

Sept. 15-20, 2019
Draft Itinerary

Grab the page(s) for the day and go.

Sunday, Sept. 15, Copenhagen

For general and cultural information, go to: <http://www.aok.dk/english> and <http://www.visitdenmark.com/denmark/tourist-frontpage>

For background information on sustainable energy and infrastructure, go to:
<http://i-sustain.com/background-information-on-denmark-and-sweden/>

From the Copenhagen airport, CPH, to the hotel:

Local trains leave CPH's International Terminal, where you arrive, every 10 minutes and go to Copenhagen Central Station (København H). This requires buying a ticket in advance and takes approx. 20 minutes. The hotel is a five minute walk from the train station.

Check into the Scandic Palace Hotel

Rådhuspladsen 57

6:00 pm - Meet in the lobby for introductions and to review the itinerary

6:45 pm - Leave lobby to walk to Welcome Dinner

7:30 pm - Welcome Dinner at 56 Grader

Address: Krudtloeksvej 8

Patricia: 1-206-349-4904 / Jayson: 1-206-354-2278

Monday, Sept. 16, Copenhagen

9:15 am - Private bus leaves to hotel to go to Solrød Biogas plant

10:00 am to 12:30 pm - Arrive at Solrød Biogas (see map below)

Åmarken 6, 4623 Lille Skensved

Meet with Solrød Biogas <https://solrodbiogas.dk/en/>

Background: This is great case of agricultural industrial symbiosis. Feedstock includes: seaweed, livestock waste, food waste and industrial waste (organic waste residuals from biotech companies in the nearby area, Chr. Hansen and CP Kelco). The trucks that deliver the liquid manure to the facility, take the 200,000 tons of digestate in return and distribute it on the farms that use it for biological fertilizer. The plant is the first of its kind in Denmark to produce sustainable energy from seaweed.

Solrød provides interesting insights into the organizational structure and the engagement of the local community involving the homeowner association, Solrød Strandrensninglaug, (translated: Solrød Beach Cleaning association), corporations, developers and local authorities and utilities.

The biogas is sent to a CHP facility where it is converted into 23 GWh electricity to power 3,800 households. The surplus heat from the facility will be reused in district heating corresponding to the consumption of about 1700 households.

12:30 pm - Take the bus back to State of Green in Copenhagen Copenhagen

1:00 pm to 3:15 pm - Presentations by State of Green, Danish Energy Agency and Fors,
(includes lunch)

Address: Vesterbrogade 1E, 1620 Copenhagen V.

As the official green brand for Denmark, State of Green works to strengthen international awareness of the solutions and competences of Danish business and industry within energy, water, climate adaptation and environment.

The Danish Energy Agency was established in 1975 as an agency of the Danish Ministry of Transport and was in 2007 transferred to the newly created Danish Ministry of Climate and Energy.

Fors is a Danish utility who manages trash/recycling, heating, water and wastewater who is creating industrial symbiosis opportunities in the areas in which they work.

Dinner on your own.

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Tuesday, Sept. 17, Copenhagen/Kalundborg and Samsø Island

A little free time in the morning to sleep in or explore Copenhagen

10:00 am - Bus leaves from the hotel to go to Kalundborg

12:00 pm - Arrive at Kalundborg Utility and have lunch provided by Kalundborg Utility
Address: Kalundborg Forsyning, Dokhavnsvej 15

Background: Kalundborg is town of 16,500 residents, 65 miles from Copenhagen which developed an interesting economic development strategy. It hosts the world's most well-known example of Industrial Symbiosis, an association between two or more industrial facilities or companies in which the waste or byproducts of one become the raw materials for another. The motivation for exchange arose in the early 1970s from a mutual effort to reduce costs by seeking income-producing uses for "waste" products. Gradually, those involved realized that a carefully managed exchange of energy and materials could enable mutual economic benefit while reducing the environmental impact of large industrial operations. Today, Kalundborg's Industrial Symbiosis comprises eight core companies; DONG Energy Asnæs Power Station, Statoil-Hydro Refinery, Gyproc A/S, Novo Nordisk, Novozymes, recycling company RGS 90 A/S, waste company Kara Noveren I/S and Kalundborg Municipality. Each company is bound to each other via an intricate network of flows; flows of steam, gas, water, gypsum, fly ash and sludge. The system consists of 6 private partners, 3 public partners, over 5000 employees combined and 25 different resource streams exchanged.

12:30 pm - A presentation by Per Møller on Kalundborg Symbiosis

1:00 pm - A general introduction to Kalundborg Utility by Lars Sørensen

1:20 pm - Wastewater treatment, energy and environment by Preben Thisgaard

1:40 pm - Questions and answers and general discussion

2:00 pm - Guided tour to Tissø II. A waterwork for treatment of water from Lake Tissø where a - 10 MWh heatpump uses heat from wastewater. This installation supplies more than 30% of Kalundborg City with district heating.
- Visit the WWTP. An advanced treatment plant for industrial and sanitary wastewater

3:00 pm - Departure for Bigadan

3:15 pm - Visit Bigadan

In co-operation with Ørsted, the Bigadan biogas plant handles waste products from the insulin and enzyme production at Novo Nordisk and Novozymes. The plant produces the equivalent of the annual natural gas consumption of 5,000 households.

4:30 pm - Departure for Samsø ferry

4:30 pm to 5:30 pm - There should be time for us to grab a beer in Kalundborg before the ferry.

5:55 pm - Take the ferry to Samsø Island

Route/Ferry: Kalundborg to Ballen/Samsø.

Background: Samsø is a small island with a population of 3,724. Due to its central location, the island was used during the Viking age as a meeting place. In 1997, Samsø won a government competition to become a model renewable energy community. As a result, 100% of its electricity today comes from offshore and onshore wind power and biomass. It also has several biomass-based district heating systems so that 70% of the heat demand is generated by local resources. The island often exports renewable electricity to the mainland. Energy tourism is an important part of the local economy as interested people from all over the world come to learn how the island has become a renewable energy community.

Arrive 7:25 pm - A bus will be waiting for us to take us to the Ballen Baden hotel

Address: Ballen Havn | 8305 Samsø | Phone: +45 8659 1799 <http://www.ballenbadehotel.dk/>

8:00 pm - Dinner at Ballen Baden Hotel.

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Wednesday, Sept. 18, Samsø Island/Aarhus

Before 9:00am - Please leave your luggage with the front desk. We will not be returning to the hotel. (Your luggage will be picked up.)

9:00am - Leave hotel lobby and walk to Energy Academy

Address: Energiakademiet.dk - Strandengen 1, 8305 Samsø - Tlf. +45 8792 1011

9:15am - 3:00pm - Energy Academy including lunch at Skipperly.

Background: Samsø Island is the world's first 100% renewable powered island. Much of the fuel used is local forestry and farm waste. We will start the day at Samsø Energy Academy, which, apart from being the daily workplace for the Energy Academy's staff, is a highly sustainable building. We will learn about the processes behind local ownership and engagement. How was it possible for Samsø to become self-sufficient with renewable energy in less than 10 years? In this presentation we will explain the processes behind Samsø's 10-year transition as Denmark's Renewable Energy Island and the vision to become fossil free by 2030.

The tour of the island will include the following:

- Visit to the straw-based district heating plant in Ballen/Brundby
- Visit to a wind turbine owned by a local farmer
- Visit to the Solar PV (photovoltaic) and electrical cars owned by Samsø municipality
- Visit to Mårup local district heating plant based on 75% woodchips and 25% solar thermal collectors

For in depth background information, download the 10 year status report at their website: <http://energiakademiet.dk/en/vedvarende-energi-o/>

3:45 pm - Take the Samsø Rederi ferry to Hou. (This is not the same ferry/route we came on.)

Background on the ferry - Prinsesse Isabella will become the first CO2 neutral ferry in the world. This is the first domestic ferry in Denmark to be powered by liquefied natural gas. The goal is for the ferry to run on locally produced biogas. Residual products from the island's farming industry will form the foundation of this environmentally friendly fuel.

4:45 pm - Arrive Hou

4:50 pm - Take private bus to Aarhus

6:00 pm - Arrive in Aarhus and check into Radisson Blu.

Explore the lovely city of Aarhus and dinner on your own

Background: This Viking-founded, student-filled hub has accrued some weighty accolades — in 2017 its titles included European Capital of Culture and European Region of Gastronomy. The ever-expanding menu of architectural landmarks, lauded restaurants, bars, festivals and boutiques is a mark of a vibrant city on the rise. It's a great place to explore — compact, photogenic and friendly (its local nickname is 'the city of smiles'). Here you'll be left in little doubt why Denmark scores so highly in those livability lists.

Thursday, Sept. 19/Aarhus/Tjelle/Copenhagen

8:30 am - Bus leaves hotel for Agro Business Park

Background: ABP is an Agro-environmental incubator and business development organization located next to Aarhus University's research facility, which has a research digester. **Apple has invested 2 billion USD on a data centre in Denmark and Ireland. The size of the data centre in Denmark is 166,000 cubic meters. This is the largest investment in Europe to date. The idea is to run the data centre on 100 % renewable energy and the reason for choosing Denmark as one of their location.** The data centre is under construction and will be located next to Agro Business Park with access to wind, biogas and other renewable sources.

AGP is participating in an EU funded initiative called ValueWaste launched in November 2018. It is about urban waste upcycling for the production of high-value bio-based products. One of the participating companies is Danish UniBio. They have developed what they call the U-Loop technology, which turns methane (from natural gas or biogas) into a highly concentrated protein product, which can be used in feed for animals thru a fermentation process. Kalundborg Kommune is also participating the project.

For more information on ABP: <https://investinviborg.com/Green-Tech/Agro-Business-Park>

For more information on Value Waste: <https://www.agropark.dk/projekter/valuewaste>

9.30 am - Meet with Michael Stöckler of Agro Business Park

Address: Niels Pedersens Allé 2, Tjelle

11.00 am - Go to Aarhus University for a tour of the biogas plant and biogas upgrade

12.00 pm - Lunch at Aarhus University

12.45 pm - Tour of Aarhus University - Biorefining green biomass

2: 00 pm - Departure by bus to Skanderborg train station

3:30 pm - Train from Skanderborg to Copenhagen

You will have homework to do on the train in preparation for the meeting tomorrow morning

6.00 pm - Arrival Copenhagen; return to Scandic Palace

7:00 pm - Leave the hotel for the Farewell Dinner at Garden Restaurant

7:30 pm : Farewell Dinner at Garden Restaurant

Gothersgade 87 &, Landemærket 57

Friday, Sept. 20, Copenhagen

9:00 am to 10:30 am - Facilitated meeting by i-SUSTAIN and CSI at the hotel,
What did we learn that is applicable to Washington State? Ideas to move forward?

10:45 am to 12:00 pm - Bike tour of Copenhagen
Extended option to 2:00 pm for those who have the time.

12:00 pm - Program is officially over

Things to Think About This Week

1. Which projects were the most interesting and why?
2. Which strategies could you see adapting to your district or within Washington State.
3. What projects or strategies would you like to learn more about?
4. If you saw projects or strategies this week that you think would be adaptable to your district, how could the state be the most helpful in transforming your ideas into action?
5. Which Danish beer did you like the most?



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OF DENMARK**
Washington D.C.