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EIA for a waste incinerator in Denmark

Construction of a waste incinerator at Nordforbrænding

Type of impact assessment	Mandatory Environmental Impact Assessment (EIA)
Type of project/plan	Construction project – a new waste incinerator at Nord-forbrænding
Climate change related issues	Emissions of greenhouse gases and flooding from rain-water
Influence of the EIA	Public participation leading to incorporation of climate change risks; measures to decrease risk of flooding

A planned new waste incinerator will be located in an area which is at risk of flooding – a risk that will increase under climate change. During public hearings as part of the project's EIA, inclusion of climate risks was requested. This led to mitigation measures which will decrease the risk of flooding.

Climate change in Denmark

For Denmark, various climate change effects are predicted. These include a 1–4°C temperature rise by 2100, increased precipitation of up to 40%, and more frequent intense rains,

cloudbursts and severe storms. The sea level is expected to rise by up to 1.2 metres by 2100. These issues pressure the water infrastructure and will cause more frequent and severe floods from e.g. overflowing sewers and water courses.

In this context, waste handling company Nordforbrænding wants to build a new waste incineration oven. The company, located north of Copenhagen, aims for this new, more efficient and low-pollution oven to replace two older ovens. The new facility will also be used for heat and power production, with a capacity of 10 tons of waste per hour, and an energy efficiency of 99%. It will allow the company to increase its energy production with sufficient electricity for 13,000 households and heat for 5,000 households, while incinerating the same quantity of waste.

Nordforbrænding's incineration plant is located close to a small river, Usserød Å, which has previously flooded its low-lying surroundings. This causes considerable disturbance to local residents and damage to infrastructure. The three municipalities through which Usserød Å runs have established a joint climate change adaptation strategy to prevent further flooding. Among the initiatives highlighted in the strategy are wetlands to store water and delay discharge (with recreational values as a bonus) and a barrier in the river (sluice) to regulate water levels.

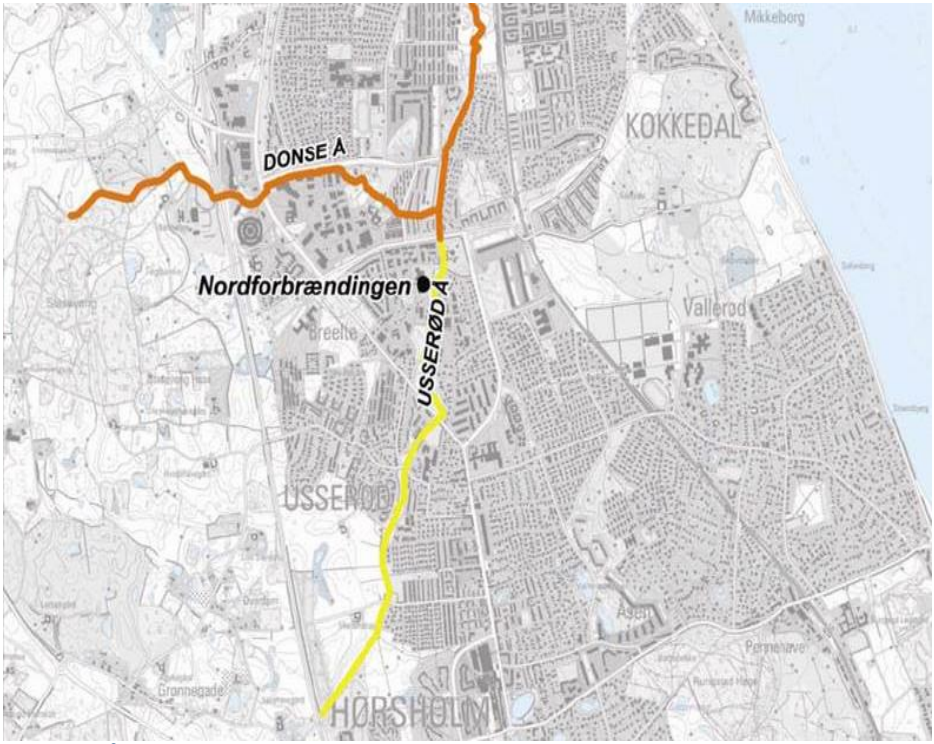
Assessing climate change risks for the incinerator

In the common climate change adaptation strategy, part of Nordforbrænding's area is mapped as being at risk of flooding. Currently, rainwater from the existing incineration plant is discharged partly into the sewage system and partly directly into Usserød Å. An assessment showed that an increased discharge can be part of the flooding problem in the river system, both on Nordforbrænding's area and elsewhere along the river. In order to minimise this risk, a goal was set: a maximum of 7,200 litres of water per hectare can be discharged to the river system. As part of this project, the cover of 1,250 m^2 of the area will change from gravel and grass (in which rainwater can percolate) to hard sealed surfaces. This means that more rainwater needs to be discharged, adding to the pressures on the river system and the risk of

flooding. With the new project, 3,036 m³ of water will be discharged into Usserød Å each year. These climate change risks were included in the EIA, based on a request during the hearing phase from one of the affected municipalities.

Climate smart mitigation measures in the EIA

In order to mitigate potential floods, 2,300 m² of the new roofs of the facility will be constructed as green roofs. They can absorb some of the rainwater that falls on the site, and delay another part of the water to prevent flooding in cases of cloudbursts. The green roofs can absorb a total of 690m3 of rain per year. The total discharge from Nordforbrænding's area with the mitigation measures in place will be ca. 500 m³ lower than in the 'zero alternative'. Without mitigation measures, more water would be discharged in the new project than in the zero alterna-



Usserød Å and Nordforbrænding

tive, making the project less attractive. In order to build further capacity for delaying rainwater, an underground basin is added that allows a 10 minute delay of a high intensity rainfall (occurring once in five years).

Conclusion: Climate smart design of the incinerator

The design of the new incinerator has been adaptive to climate change, using green roofs and an underground basin to decrease and delay rainwater discharge into the river system. This decreases the risk of flooding. The measures do not only benefit the facility, but are part of an overall strategy to adapt the river system to climate change. Together, the measures allow the discharge to stay below the maximum of 7,200 litres per hectare.

References

Miljøvurdering indeholdende VVM-redegørelse – For Ny ovnlinje 5 på Nordforbrænding I Hørsholm Kommune. 2012. www.mst.dk/media/mst/Attachments/VVMredegrelse.pdf.

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Characteristics of climate smart(er) project:

- Three-step approach applied
- Climate smart(er) project design ✓
- EIA increased commitment for project ✓

Climate smart(er) because:

- Green roofs and underground basin absorb rainwater and delay rainwater discharge.
- The pressure on the Usserød Å river system is minimised.
- The project and climate change adaptation measures are connected to a broader adaptation strategy.

This case is part of the publication 'Environmental Assessment for Climate Smart Decision Making: Good practice cases', published by the NCEA in 2017. See www.eia.nl for the other cases.