



From “waste” to “surplus” heat. Experiences with CBAs and data centers in Norway

Dag Arne Høystad

Senior adviser, NVE

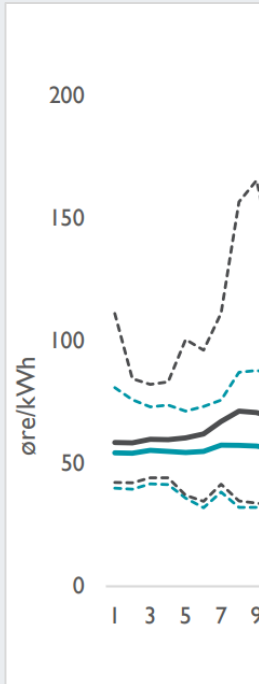
October 24th, Cyprus

Content:

- I. About NVE
- II. Regulations on surplus heat
- III. Requirement for cost- benefit analysis
- IV. Data-centers in Norway with two example CBA
- V. Questions related to the cost- benefit analysis
- VI. Additional enabling regulations



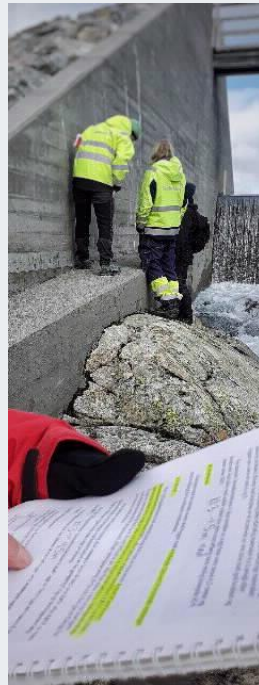
I. The Norwegian Water Resources and Energy Directorate



Analysis



Licensing



Supervision



Preparedness



Energy efficiency

II. Regulations on surplus heat

1. Waste heat (emission) traditionally regulated by the Pollution Control Act
2. Surplus heat now also included in the Energy Act:

Hearing, webinars and consultations with stake-holders

Utilization of
surplus heat
included in the
energy law

16.06. 2023

Regulation on
Cost-benefit
analysis

25.09.2024

Detailed guide-
lines

27.03 2025

Legal requirement
of Cost-benefit
analysis

01.04 2025

[Lov om produksjon, omforming, overføring, omsetning, fordeling og bruk av energi m.m. \(energiloven\) - Kap. 7. Energiplanlegging og kost-nytteanalyser – Lovdata](#)

[Forskrift om kost-nytteanalyse av mulighetene for å utnytte overskuddsvarme – Lovdata](#)

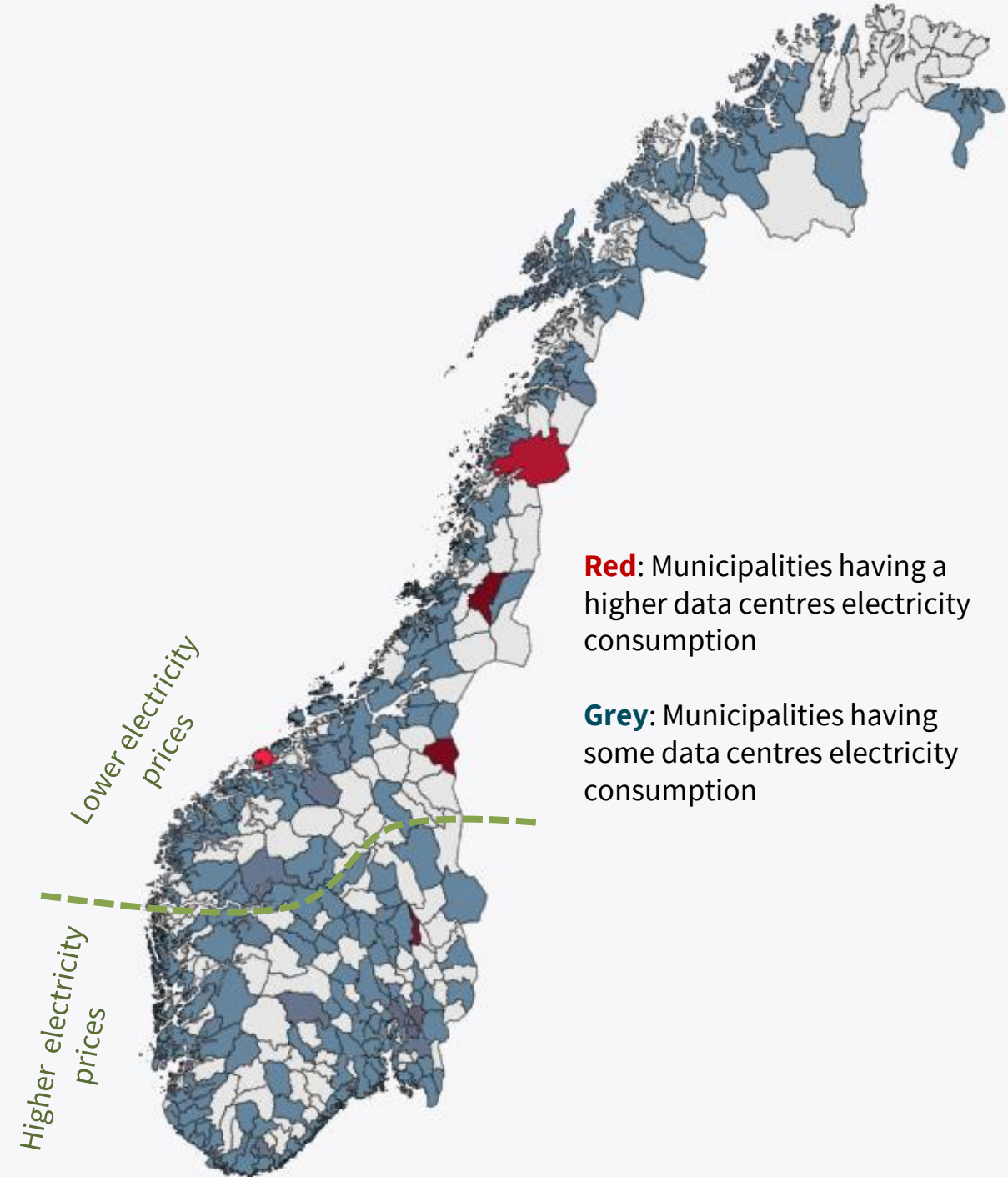
[Kost-nytteanalyse av overskuddsvarme](#)

III. Requirement for cost- benefit analysis

- Adaptations to EED
- From “waste heat” to “surplus heat”
- Included installations with **electrical effect** (20 MW)
- Included **data centers** with more than 2 MW nominal effect
- Installations with electrical effect **not required** to ensure utilization of heat, even given a positive CBA

IV. Data-centres in Norway

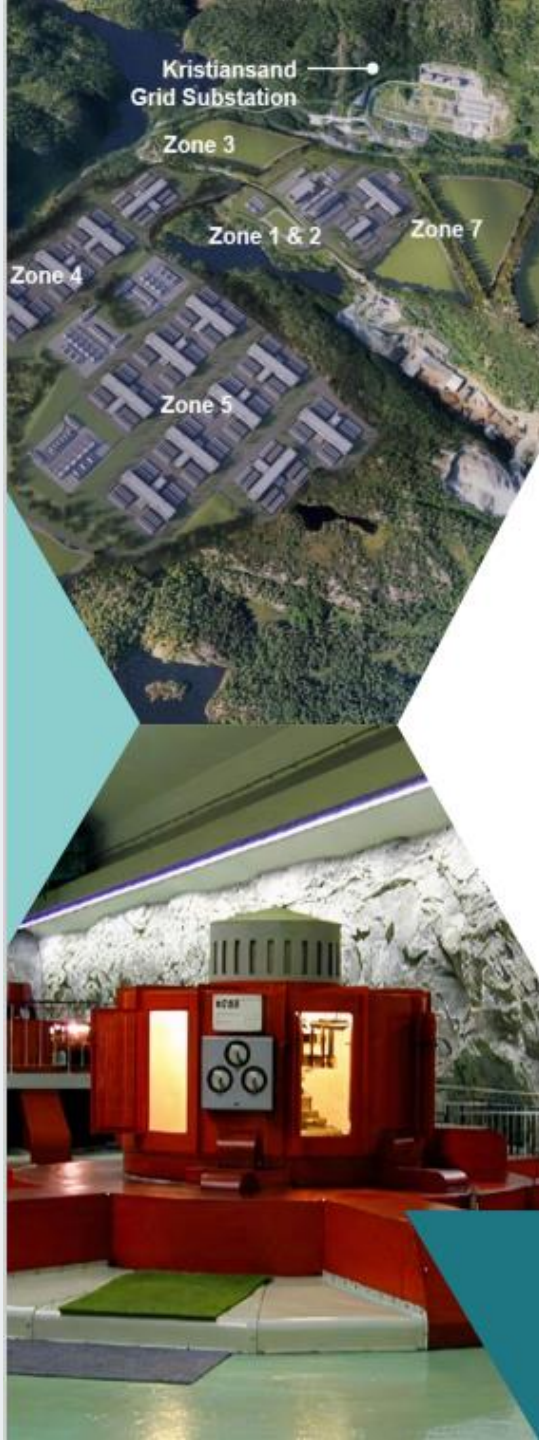
- Growth in data centres last 2-3 years
- 2 TWh electricity consumption in 2024
 - 1,4 TWh first half of 2025
- Drivers for location:
 - Hyperscale centres : stable electricity grid connection, low latency internet connection, stable politics, cold climate
 - Crypto mining: establish in areas with low electricity prices





Bulk

- 2nd hall 30 MW (of 5 planned)
- 25 C water, 4 MW surplus heat at 0 cost.
- 11 km to district heating
- Have invited potential heat users
- CBA on heat central, heat pump > 55 C, 5 MW
- Early involvement of stake holders



Google



- 2nd hall 120 MW (of 6 planned)
- 32 C water, 44 MW surplus heat at 0 cost.
- 7 km to district heating
- Have invited potential heat users
- CBA on heat central, heat pump, dh > 55 C, 5,5 MW x n
- Early involvement of stake holders

V. Questions related to the CBA

- How to define electrical effect?
- What is before start of construction?
- How to handle restricted information?
- Additional CBA for each new data-hall?
- How to make CBA without real of-taker?
- Who can make the CBA?
- How to document stakeholder involvement?

 NVE DIGITAL VEILEDER

Kost-nytteanalyse av overskuddsvarme

Publisert 27.03.25 | Sist endret 02.09.25

🔗 🖨

Kapittel 1. Formål, virkeområde og definisjoner ▼

Kapittel 2. Plikt til å gjennomføre kost-nytteanalyse ▼

Kapittel 3. Innhold og gjennomføring av kost-nytteanalyser ▼

Kapittel 4. Innsending, godkjenning og bruk av kost-nytteanalysene ▼

Kapittel 5. Diverse bestemmelser ▼

VI. Additional enabling regulations for surplus heat utilization

- [National guidelines](#) on climate and energy in land-use planning
 - Facilitate district heating and utilization of surplus heat
- Updated heat-map
- Surplus heat voluntary reported in energy audit of a large enterprises
- Economic incentives for use of surplus heat
- Proposed amendment in the Energy Act open for consultation
 - Out-put levels correspond to EED 2023 (1, 7, 8, 10 MW)
 - One alternative suggest that all types of installations are mandated to utilize the waste heat unless, it is economically unfeasible proven by CBA.



Takk for meg!
dahod@nve.no