



**The new administration building for the Ringvegen housing cooperative
A holistic energy concept with local energy production**

Alise Plavina/ PIR II AS /Nordic ZEB+ / Trondheim 07. 11. 2019



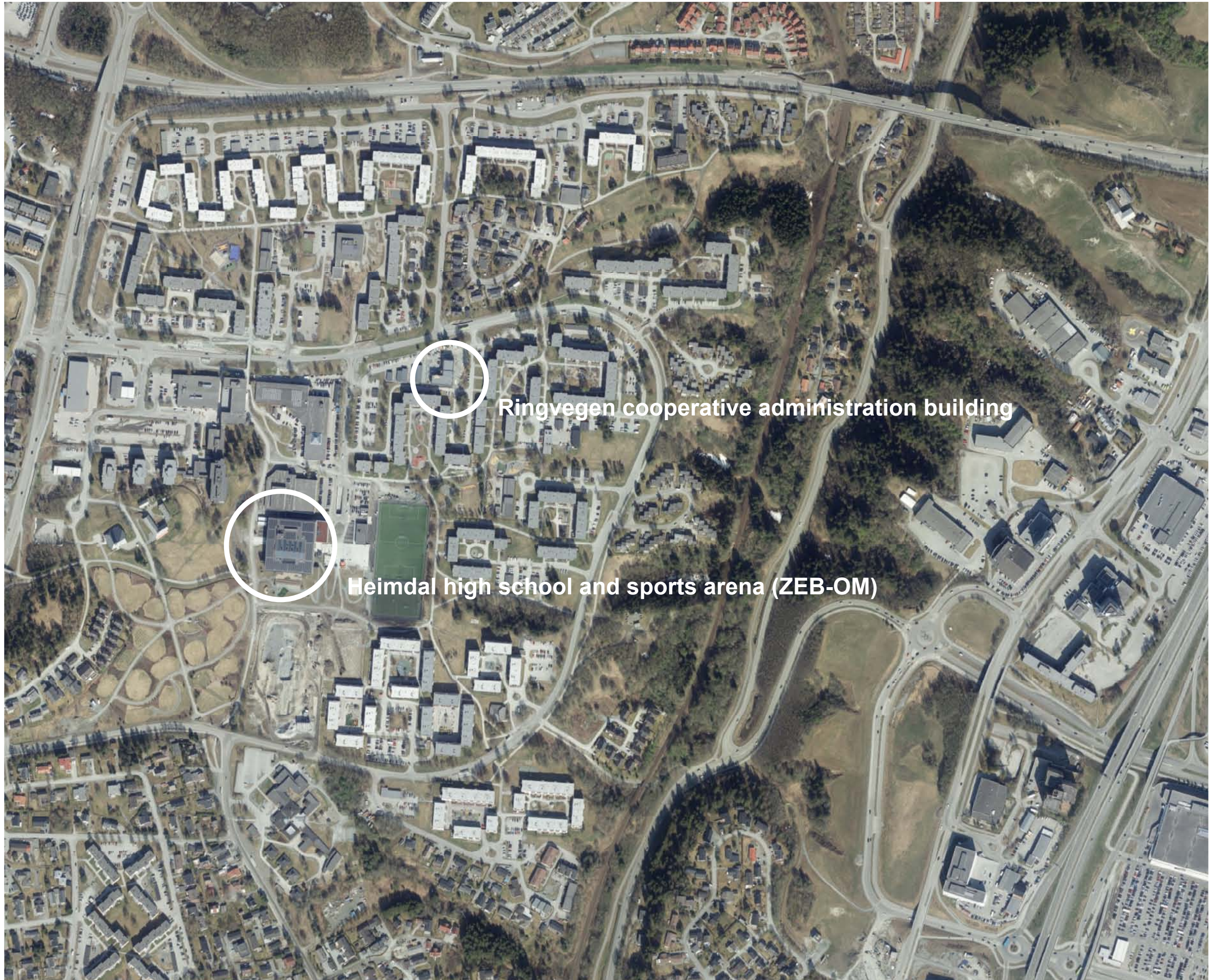
The Location



Trondheim city centre

Ringvegen housing cooperative

The Location



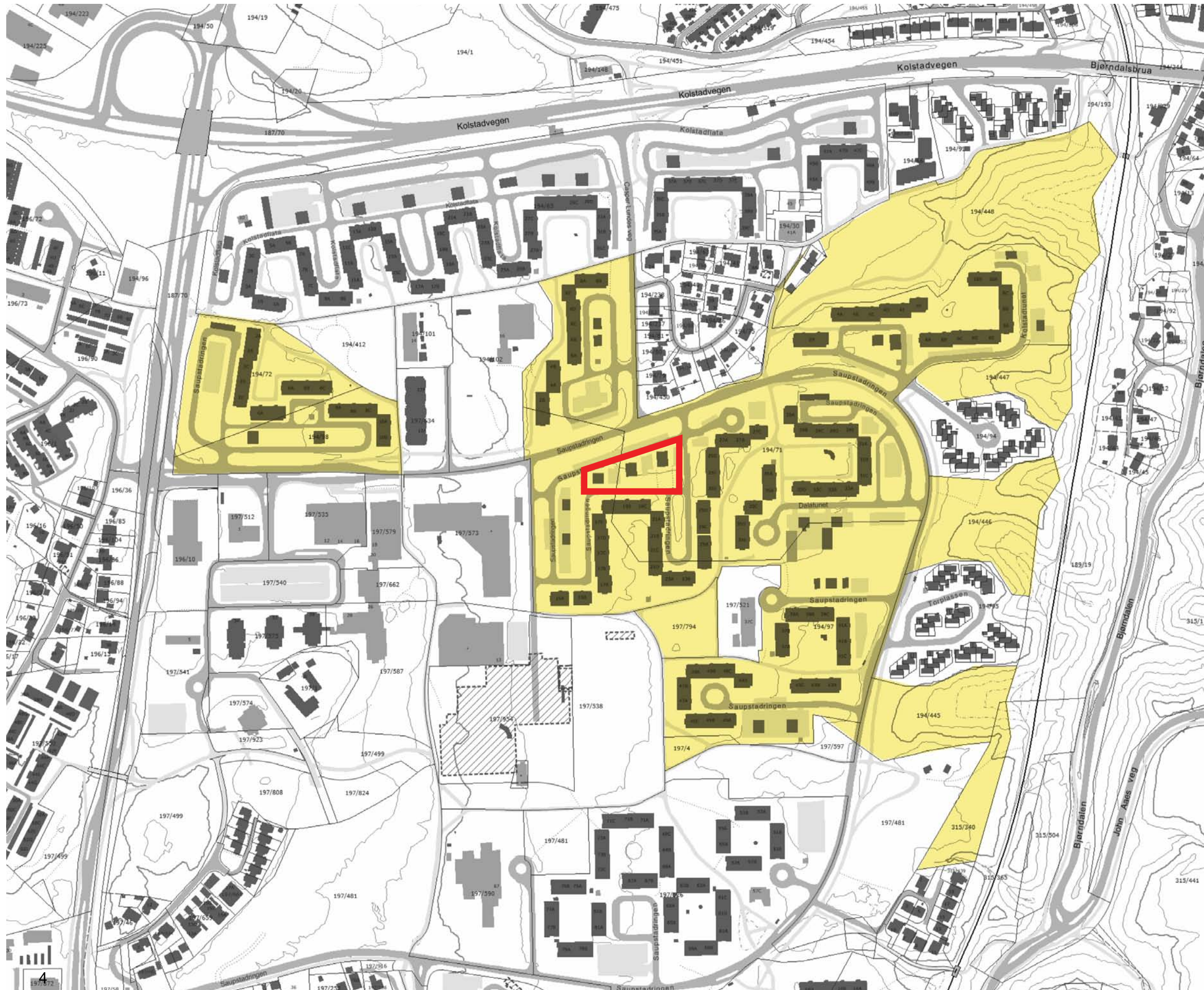
Ringvegen cooperative administration building



Heimdal high school and sports arena (ZEB-OM)

Ringvegen Housing Cooperative

- Built in the period 1971 - 1973
- 911 flats divided in 32 low-rise blocks
- The old administration building is from 1970s
- A need for a new building with better working conditions (garages, workshops, administration), as well as common areas for the inhabitants of the cooperative
- Interest in environmentally friendly and future-oriented energy supply
- Test-arena for future upgrading of whole housing stock (primarily electrical heating)

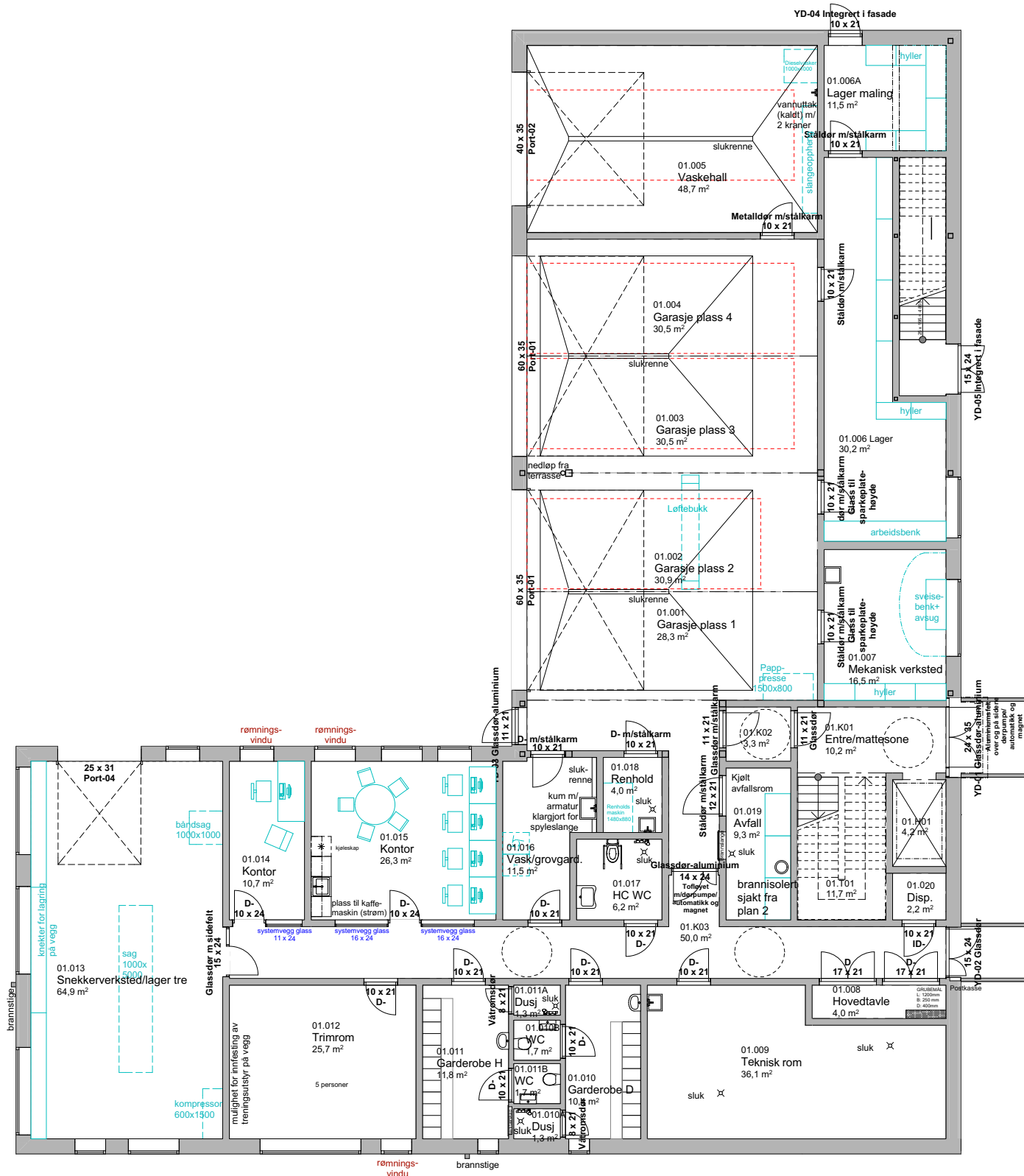


Site plan

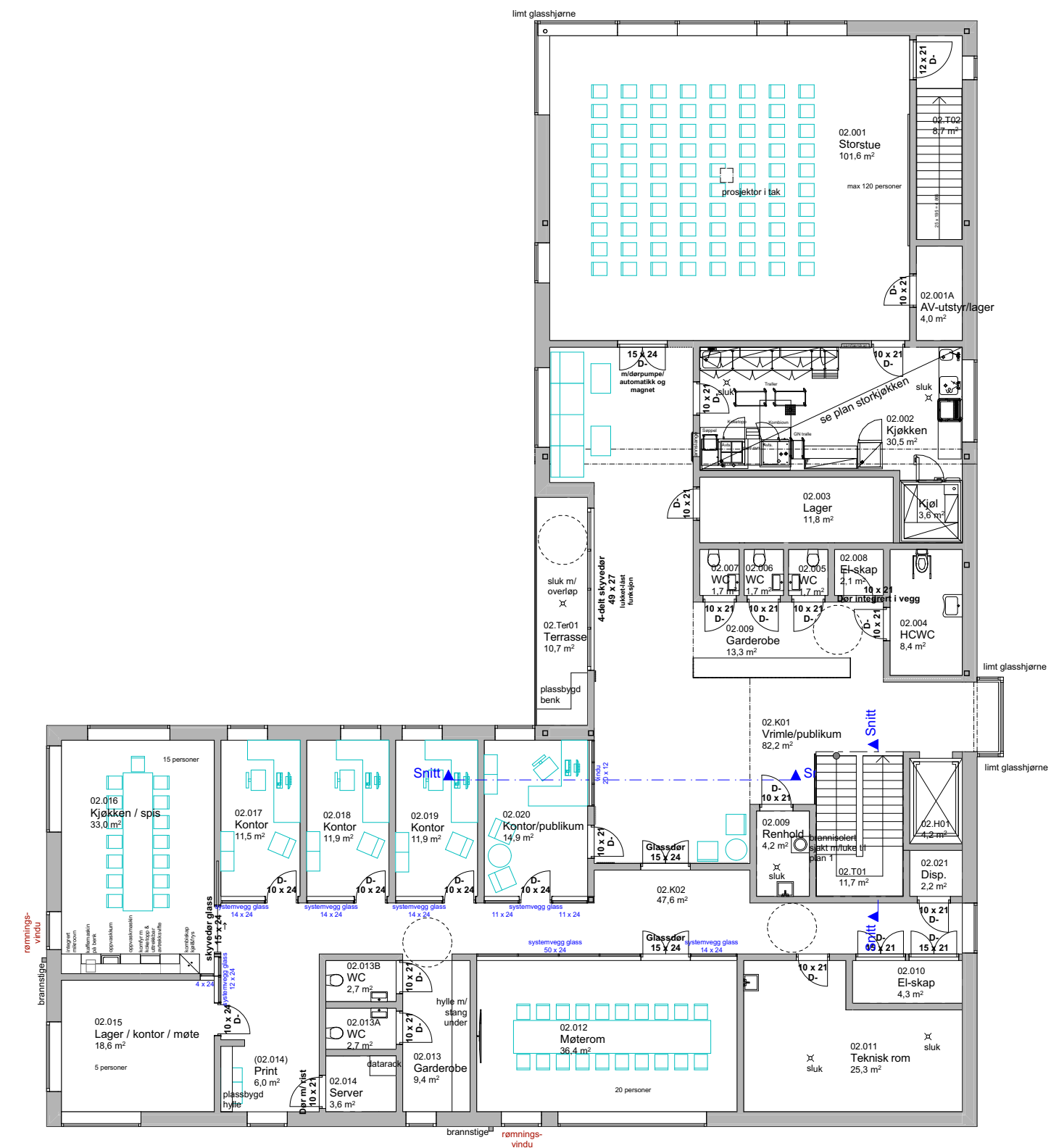
- A new administration and community building for the Ringvegen housing cooperative
- 20 new garages with charging facilities for el.cars connected to the new building



The building/ functions



Plan 1. floor



Plan 2. floor



A holistic energy concept

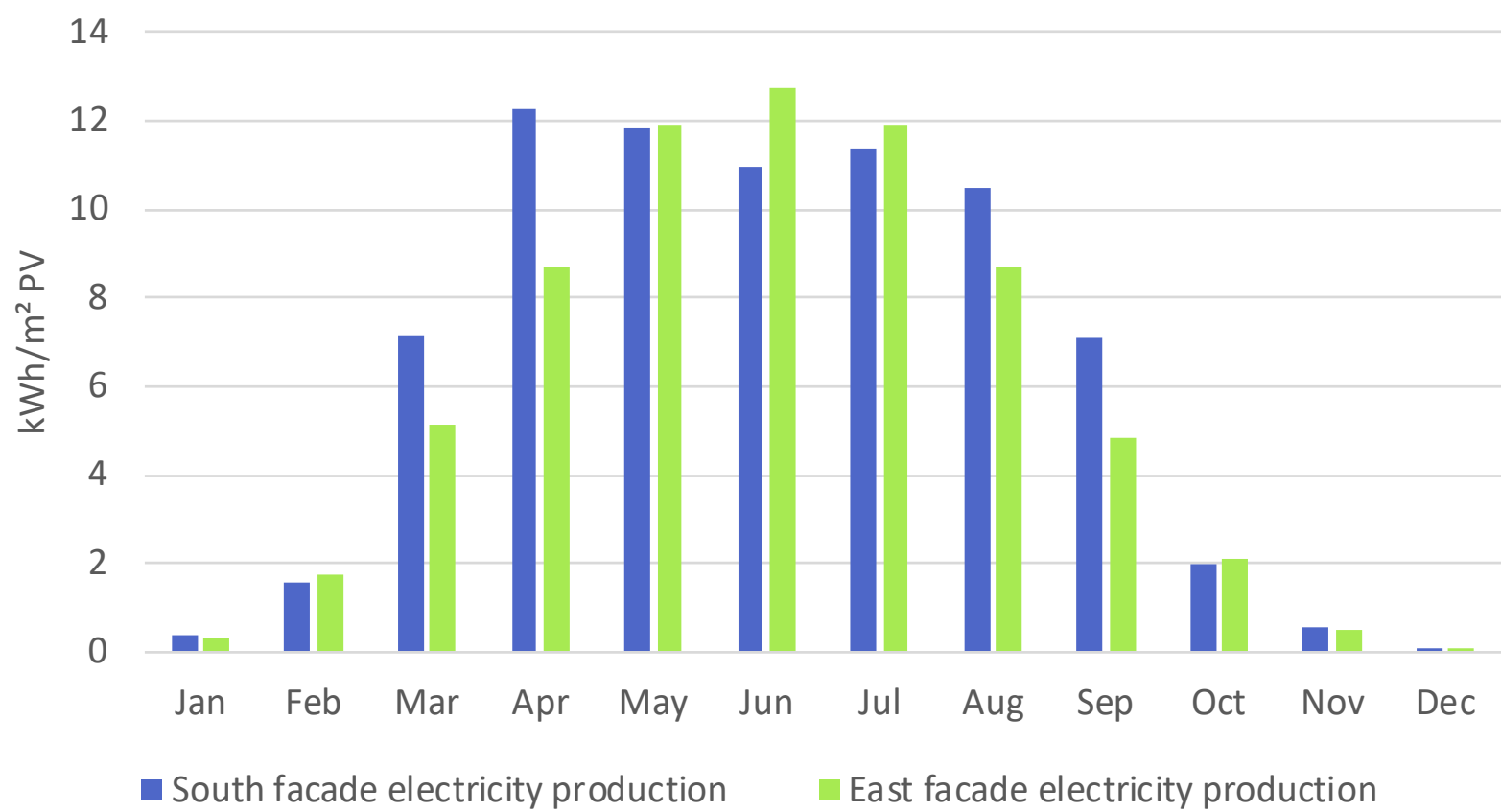
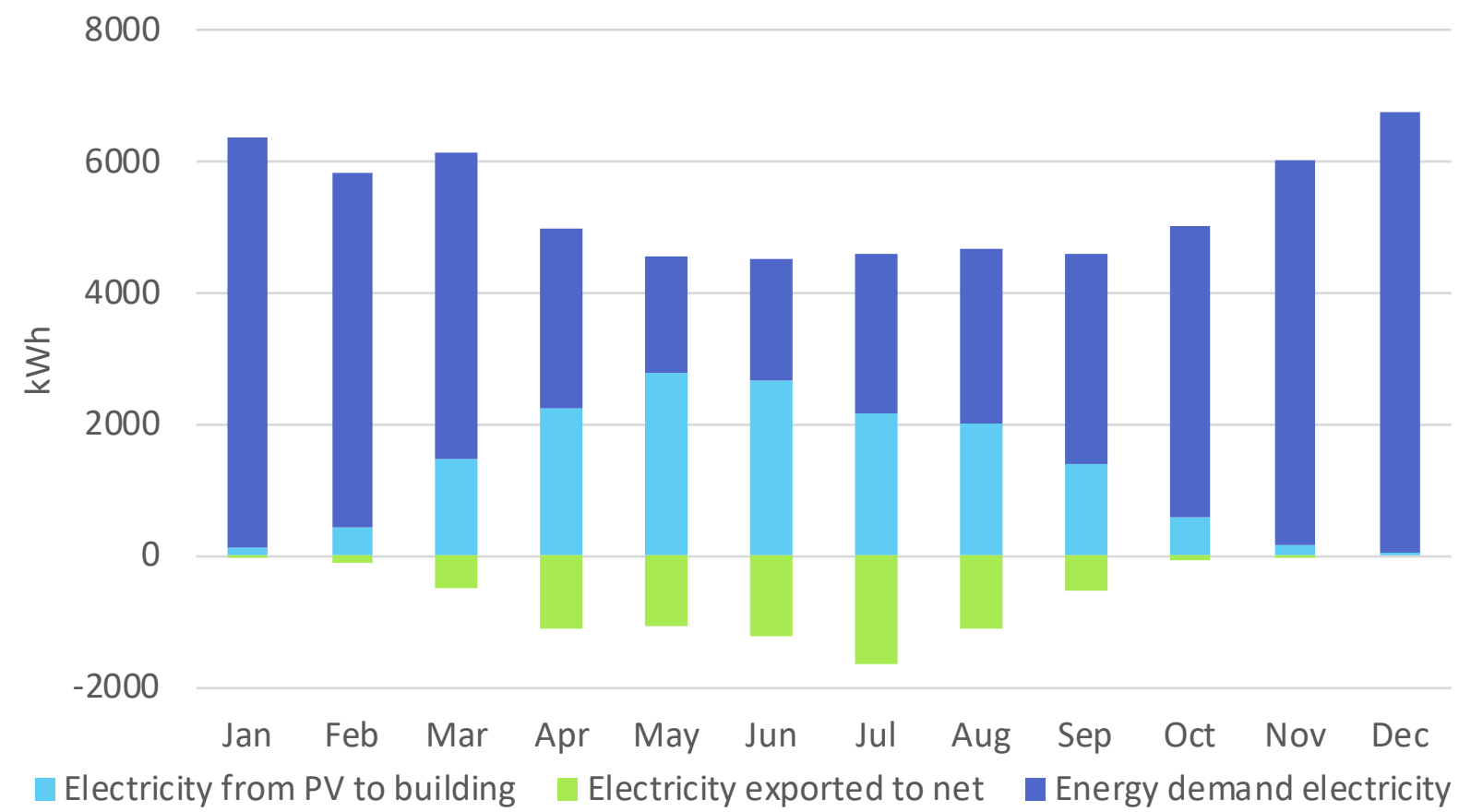
- **Passivhouse standard (NS3701)**
building with local production of electrical and thermal energy
- **Geothermal heat pump** covering heating and hot water
- **BIPV: thin-film PV-installation** on the facade of the building, area: 280 m²
- Focus on **local use of produced solar electricity** and reduction of mismatch, not maximum production
- Supported by **ENOVA** scheme 'Energy efficient new buildings'

Building typology	Light industry (1.floor)	Offices (2. floor)
Net energy demand		
Reference TEK17, (kWh/ m2)	140	115
As built, (kWh/ m2)	86,7	70,6
Delivered energy		
Direct electricity, (kWh/ m2)	45,9	43,5
Heat pump, (kWh/m2)	15,4	10,3
Total delivered energy without PV, (kWh/ m2)	57,6	
Photovoltaics		
Production for own use (kWh/ m2)	13,5	
Surpluss for export to el-cars (kWh/ m2)	7,0	
Total delivered without export (kWh/ m2)	44,1	

The building in numbers

- Useful area: **1 145 m²**
- Energy demand reduced by ca. **40%** compared to current building standard
- Local production of thermal energy and electricity
- **23,5%** of the buildings energy demand covered by solar electricity
- **66%** of produced energy used directly in the building, the rest used locally for charging electric cars

Kilde: Energirapport Ringvegen administrasjonsbygg/ HENT/ Energirådgiver Ann Helen Fjell



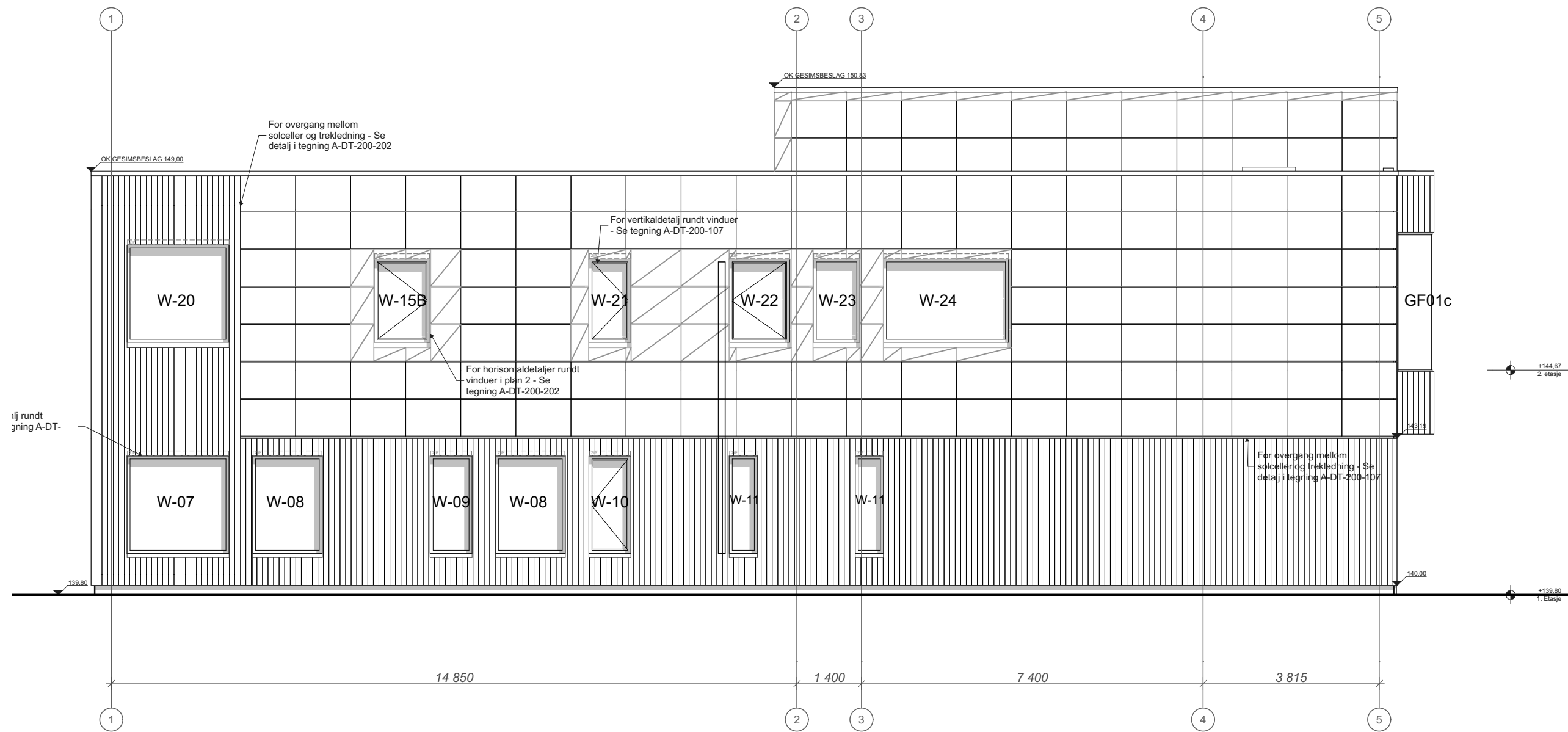
The building in numbers

- **BIPV: thin-film PV-installation** on the facade of the building
- Installed area: south 130,7 m², east 149,5 m²
- Installed power: **43,21 kWp**
- Product: **Solibro SL2-145**

Source: Application material to ENOVA // Pir II AS

Source: Solbære AS

Facade concept

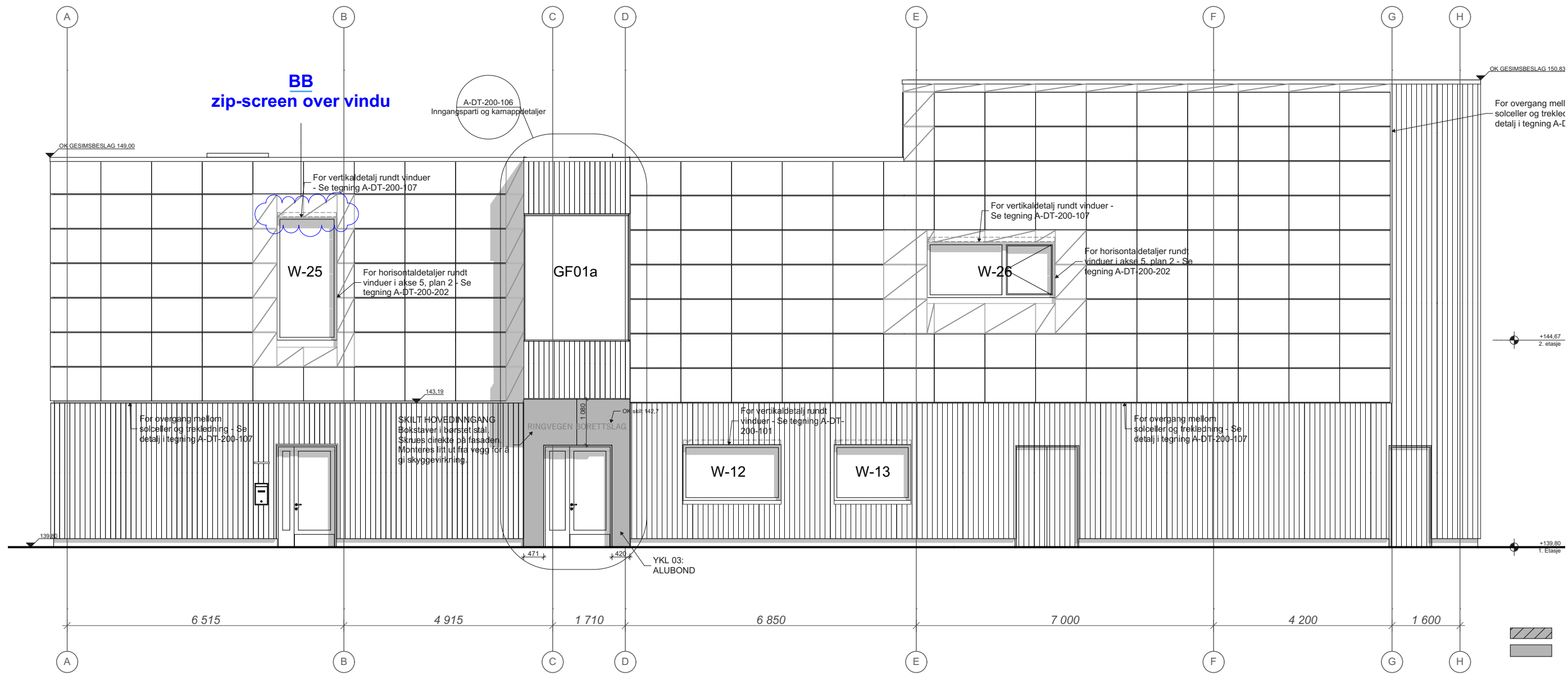


FASADE VEST

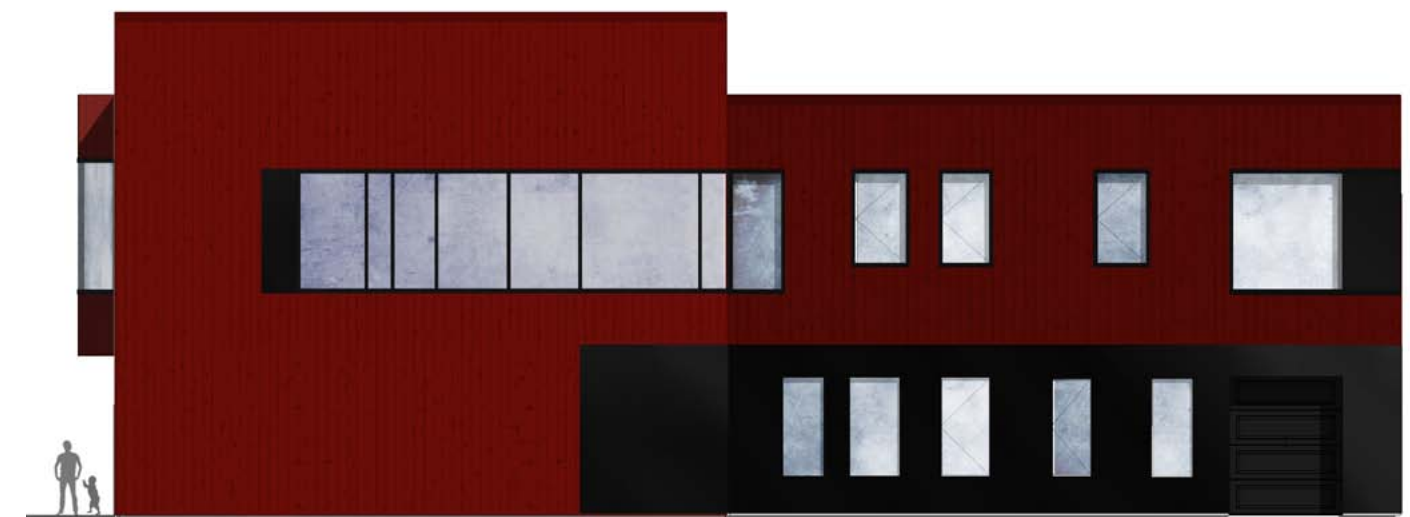


FASADE SØR

Facade concept



FASADE ØST



FASADE NORD





Project team:



Supported by:

