

# LUMIERE

*Technical requirements and options*

# *Core Requirements*

- Space for lasers in an appropriate DLA.
- Excellent environmental control of the DLA.
  - High capacity air conditioning sufficient to stabilize temperature to better than 0.5°C
  - Basic “clean room” conditions .. ISO- M7 or better ... laminar flow unit installed over benches
  - Low vibration environment
- Easy optical beam path from DLA to laser injection point.

# ***Typical Laser Space Requirements***

## **CW LASERS**

Depends on expected operating time but typically 1 x Dye laser setup and 1 x TiSa setup. (Both with external cavity fx2)

Pumped by 2xDPSS or 1x DPSS + 1x Ar<sup>+</sup>

→ 2 optical benches each of ~1m x 4m

## **PULSED LASERS**

2x large frame YAG lasers + 2 x seeded TiSa cavities

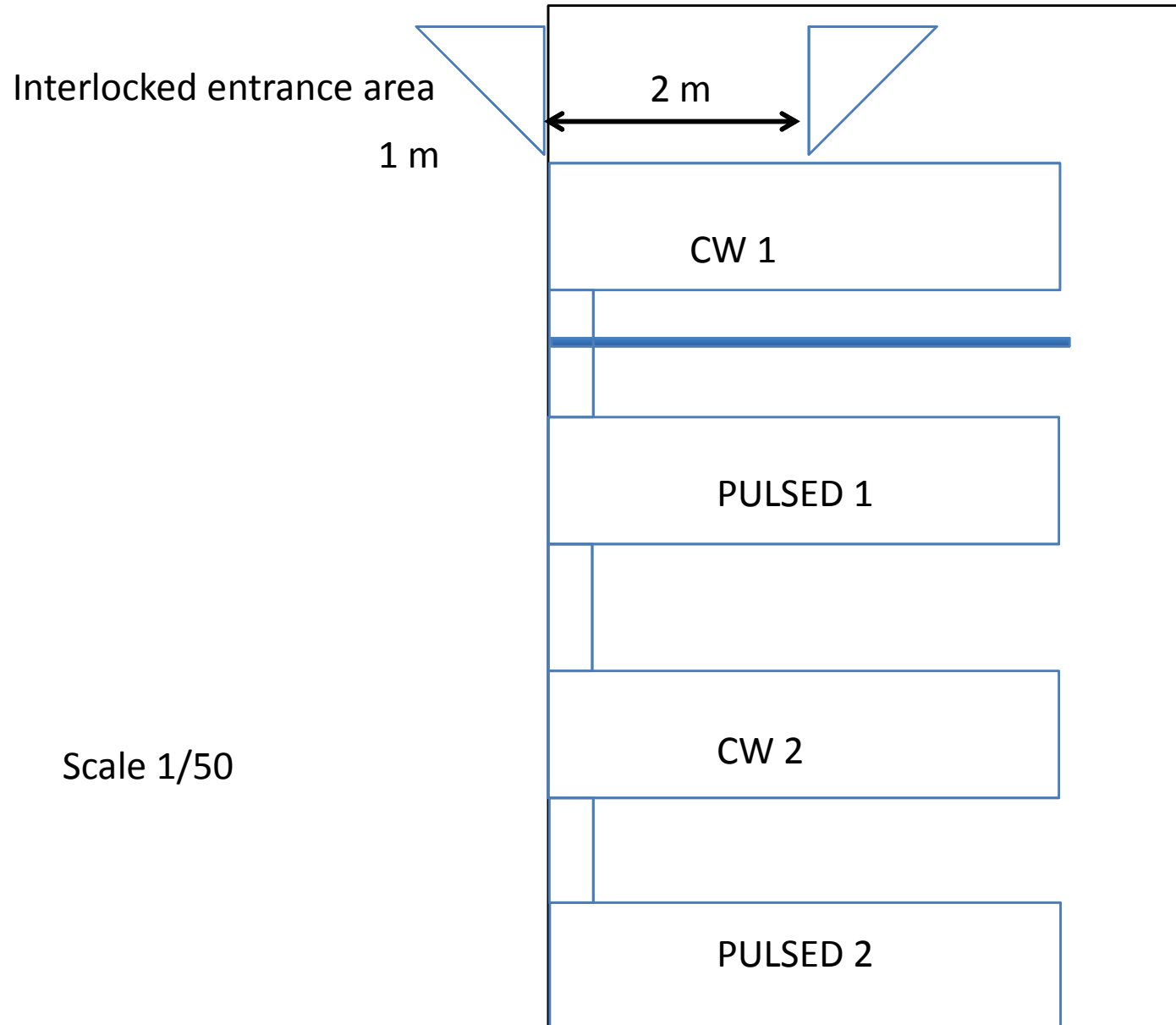
→ 2 optical benches each of ~1m x 4m

**WALKING/WORKING SPACE** 1m<sup>2</sup> per m<sup>2</sup> of laser table → 16m<sup>2</sup>

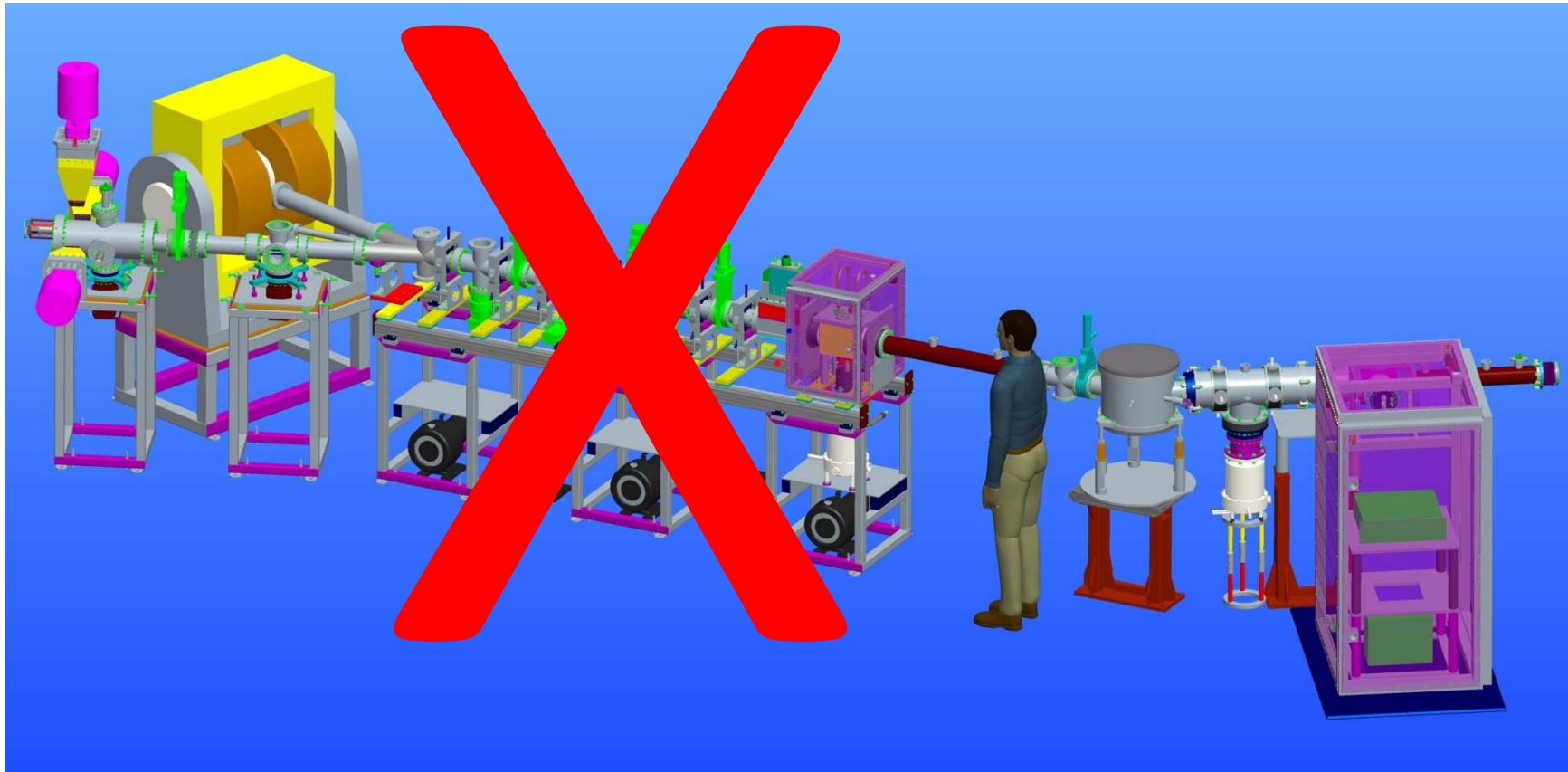
**POWER SUPPLIES AND SERVICES** 1m<sup>2</sup> / laser system → 4m<sup>2</sup>

**Total = 36m<sup>2</sup>**

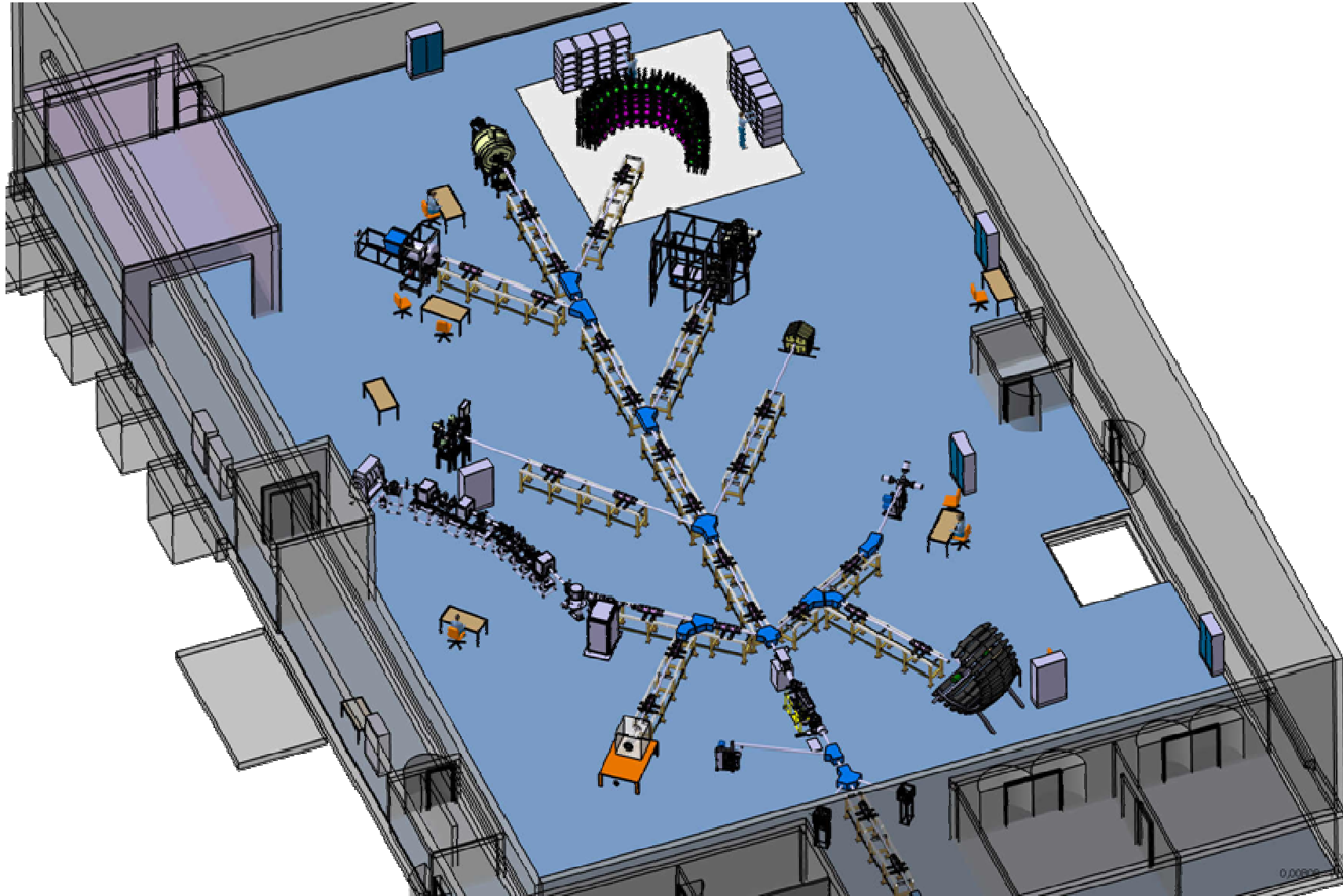
# ***Possible DESIR Laser room - 8x5 m<sup>2</sup>***



# ***Combined line does not work***



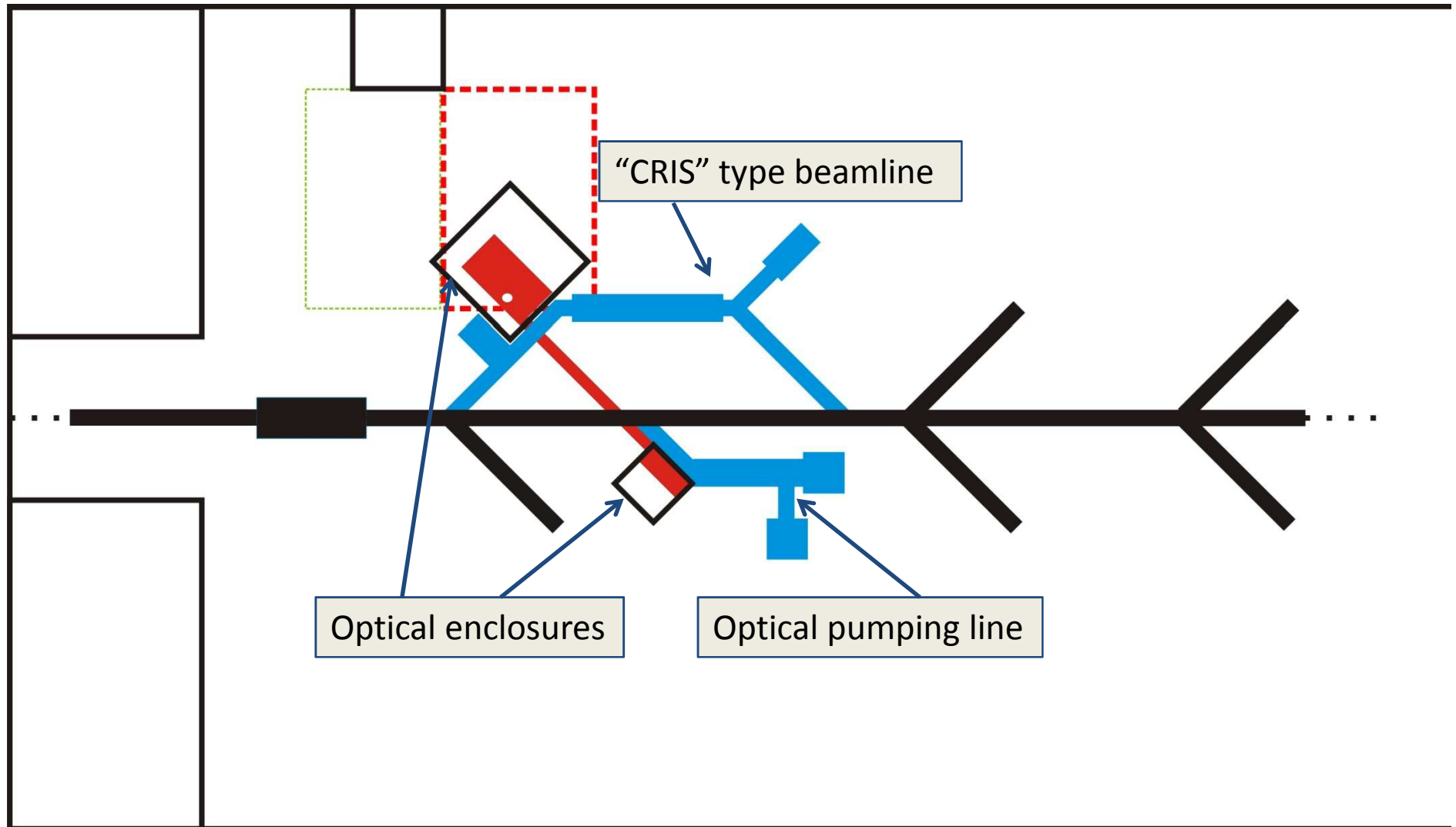
# *Layout for core program*



# ***Additional possibilities***

- A core feature of the CRIS technique is the ability to provide ultimate isotopic and isomeric purification of beams.
  - Do other experiments want to make use of these features?
  - Are such users “fixed installations” or could they relocate to the end of the laser line?
  - How many UT’s / year can we assume for core programme + providing this service (laser space requirements)?

# *Alternative Layout*





# ***Additional requirements***

- In the event that LUMIERE should provide a substantial service commitment to DESIR additional space and lasers become necessary.
  - For this purpose a cabin in the hall area could house part of the pulsed laser system freeing up space in the main DLA.

## ***Power and Water – (Absolute Max)***

- **Ar<sup>+</sup>** (SP 2085): 57 kW. Water cooled  
20 l/min consumption.
- **Nd: YAG** : 10 kW each 8l/min water.
- **Verdi** : 1.3kW
  
- Beam line ~ 1kW/ Pump Station (6 CRIS +  
Polarization line)
- + ~4kW CEC and other power supplies.