

# Metering concept for Geneva

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## Ongoing activities in Switzerland

Canton of Geneva: preparation to introduce standard

- **Metering concept** for data centre infrastructure efficiency (C1 = DCiE)
- **Measurement** of data centre infrastructure efficiency in 10 – 20 data centres **by different teams**
- In order to define values of indicator C1 (= DCiE) to be used
  - as minimal requirement (**mandatory standard**)
  - target value (**best practice**)

## Metering concepts

Elaborated by

-  AMSTEIN + WALTHERT
-  willers

## Metering concepts

Following two characteristics of data centres:

1. Reliability: Tier levels I – IV defined by Uptime Institute
2. Cooling by equipment
  - dedicated to data centre
  - used for the whole (office) building

### Metering concepts for Tier IV with dedicated colling equipment

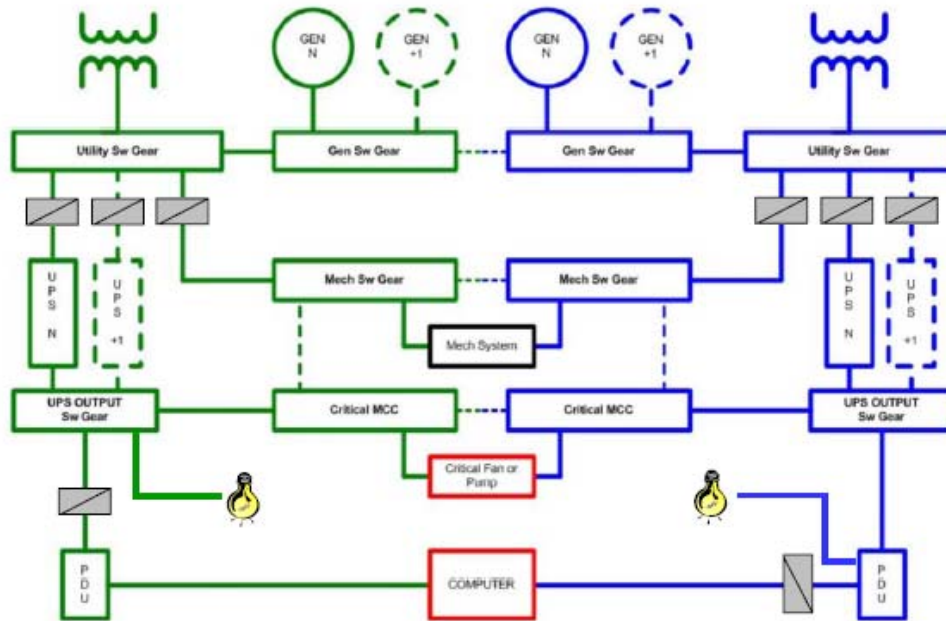


Figure 4 : principe de mesure avec production de froid dédiée et 2 variantes éclairage

### Determination of cooling energy for not dedicated colling equipment

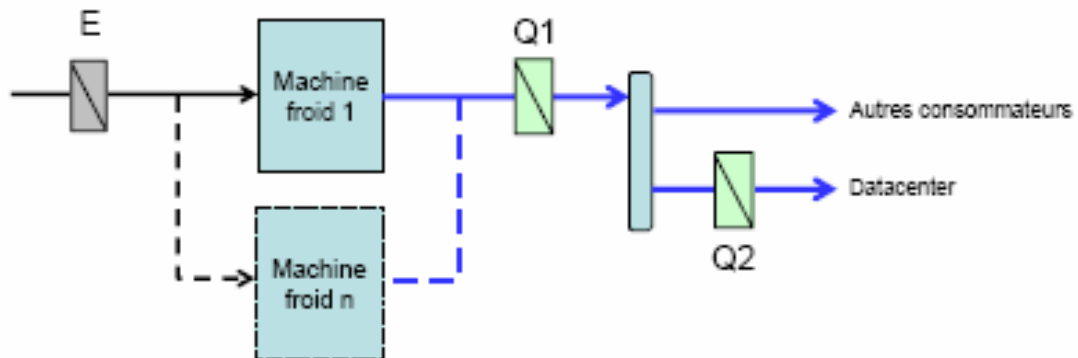
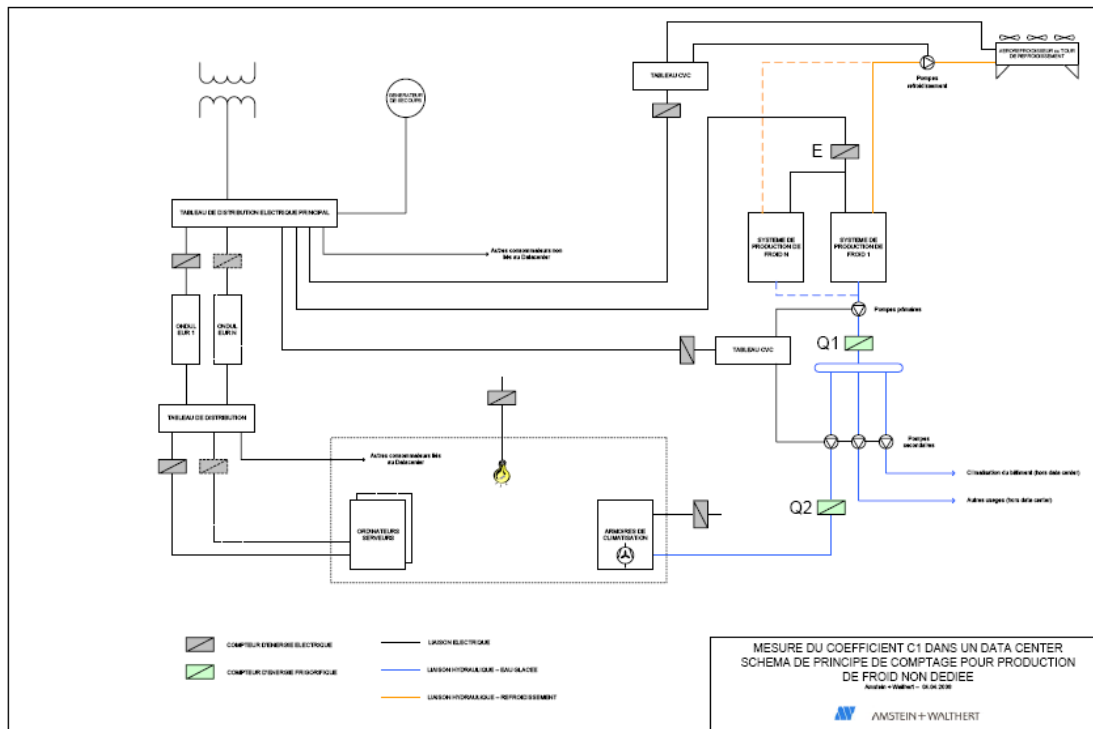


Figure 6 : principe de mesure de la consommation électrique des machines frigorifiques en cas de production non dédiée

$$E_d = E \times Q_2 / Q_1$$

## Metering concept for Tier IV with not dedicated cooling equipment



## Frequency of read out and reporting

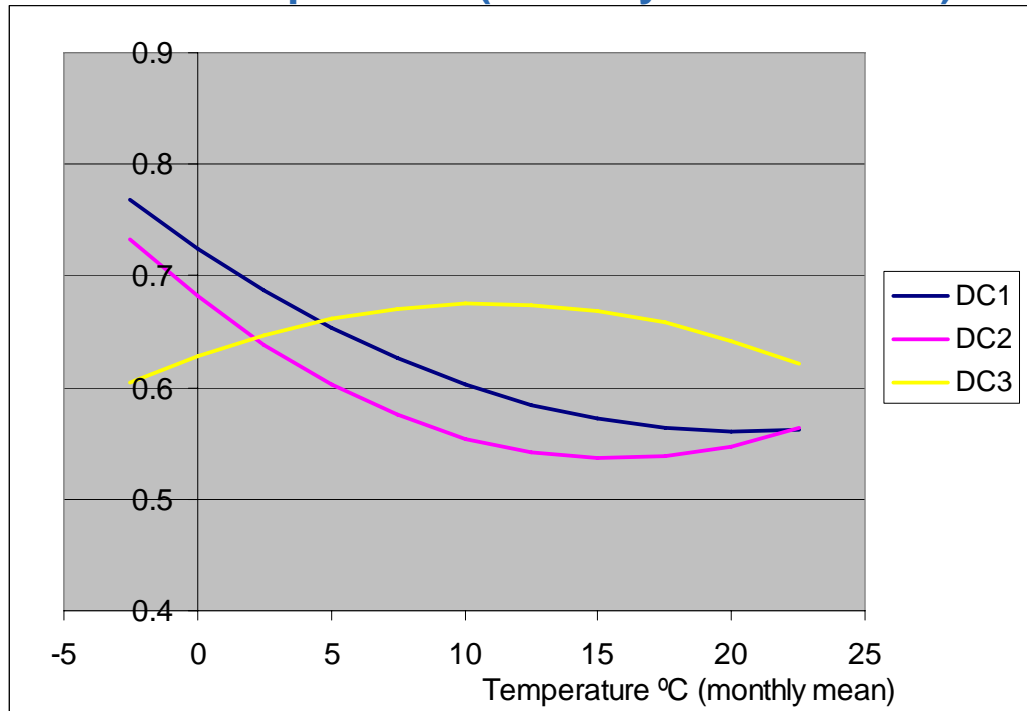
### Automatic read-out:

- read out locally or from distance
- frequency no problem (except amount of data)
- electronic data base

### Read-out by hand:

- read out at least once a month (at least monthly data points needed for analysis)
- reported in tables

## Data centre infrastructure efficiency in function of outdoor temperature (monthly mean values)



Source:  
Swiss DCEE  
Group, 2007;  
Baenninger,  
2007

## Reference

Baenninger, M., 2007. Energy consumption of large data centres in the financial sector in Zurich. Internal working paper.

Maucoronel C. and J. Willers, 2008. Concept de mesure standardisé pour les centres de calculs et leurs infrastructures. Elaborated by Amstein+Walthert and Willers Engineering. On behalf of the Canton of Geneva. April

Swiss DCEE (data centre energy efficiency) Group, 2007. Internal working paper.