Hands on experiences in setting-up and running of renewable energy solutions in Africa

Norbert Demmelbauer
BBM / 2014

BBM Austria

Procurment company of MIVA

- Service provider for NGOs
  - (Vehicle) procurement
  - Infrastructural projects
  - Logistics
- 25 years of experience
  - Since 1995 ecological sanitation with „sustainable technology“:
  - Established network of technicians

Setting up renewable energy systems:

- **Before any detail planning / installation:**
  - Need assessment: list of loads, interviews, expectations
  - Project partner capacity evaluation (on maintenance, technical understandings,..)
  - Environment conditions
  - Local market survey
  - Quality / cost performance ratio
  - Proper design and selection of system (real stand alone, hybrid, …)
  - Budgeting of complete system including: accessories, proper wiring, protective components, maintenance tools, lightening protection / earthing
  - Drawings, programming software

Setting up renewable energy systems:

- **Installation:**
  - Trained local expert team required
  - Proper tools and instruments
  - Commissioning and staff training

Setting up renewable energy systems:

- **Problems encountered during installation:**
- Untrained technicians
- Unknown equipment
- Changed conditions from planing state
- Bad quality, obsolete or wrong equipment, manuals in wrong language
- Cultural understandings / misunderstandings
- Mixture of international standards
- Environmental conditions
- Legal aspects /permits etc
- Norms and concepts
- Technical workmanship & supervision
- Managerial aspects (financial planning and financial constrains of institutions)

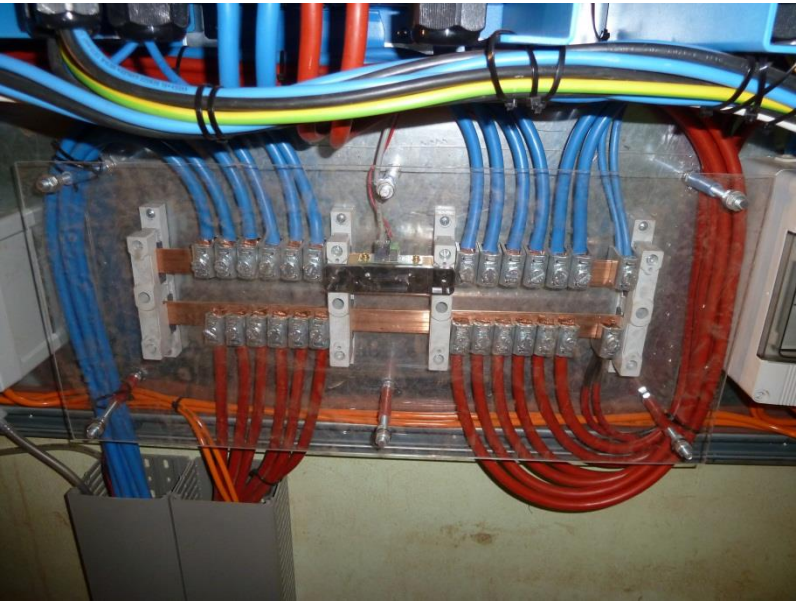
Running of renewable energy systems:

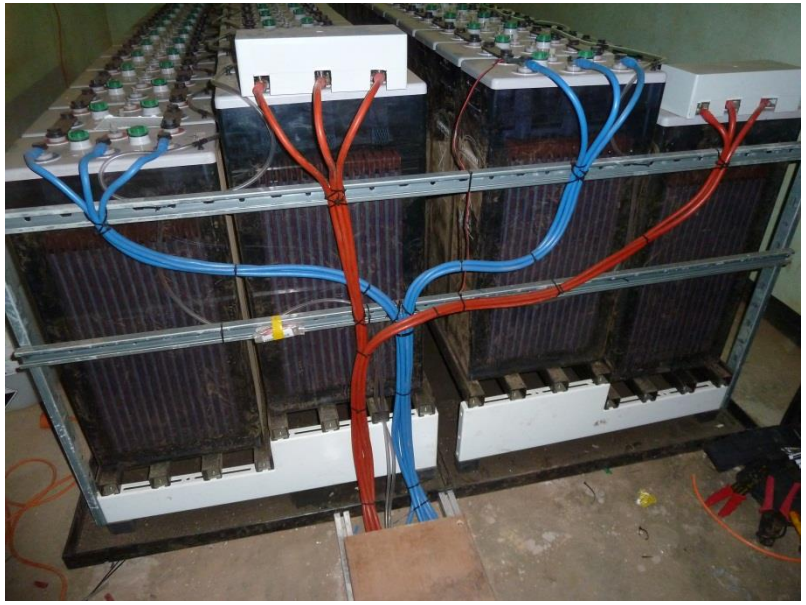
- **Criterias for good working system (like PV):**
  - Basic understanding of the system – Key phrases:
    - Energy saving is the most important. Switch off the light and equipment when not needed
    - the PV system is not a generator
    - The battery has limited capacity and limited life cycle time
    - No heating elements on the PV lines
  - Person in charge for daily / weekly control
    - Visual check of panels, battery and electronic components (e.g. surge arrestors)
    - Acid level of battery
    - Float time hours
  - Well trained maintenance technician for monthly / quarterly check up
    - Check of acid density
    - Electric contacts DC and AC: bolts, nuts, plugs etc
    - Remaining cyle life time of battery (Ah test, conductivity, ..)
  - Perfect set of technical manuals / technical drawings and supplier contacts
  - Proper set of tools and monitoring devices

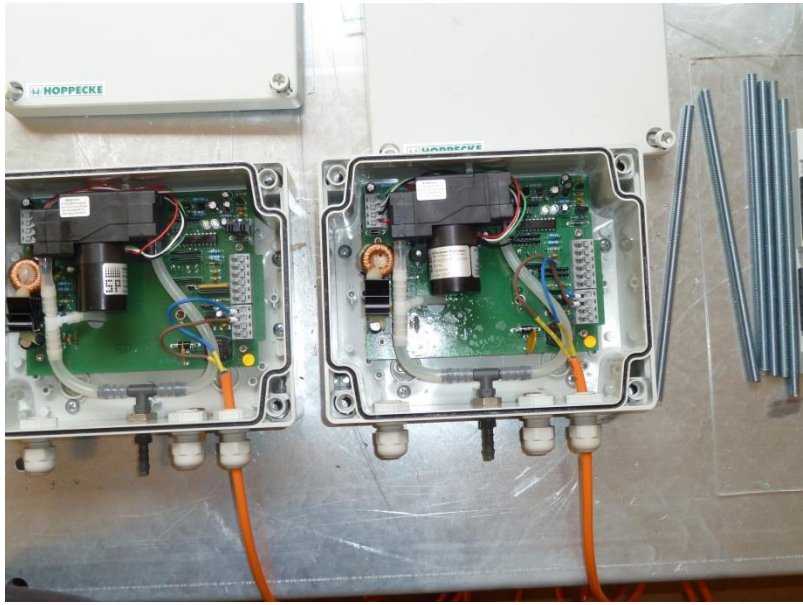
Example 1: Laundry systems
St Marys Hospital, Lacor

- Problems:
  - Ebola outbreak August 2000 - January 2001
  - 224 people including 13 hospital staff died
  - Water and electricity was wasted
- Solution:
  - New adapted laundry system implemented
  - Barrier medical care washing machines
  - 100 m² solar hot water systems


G1000





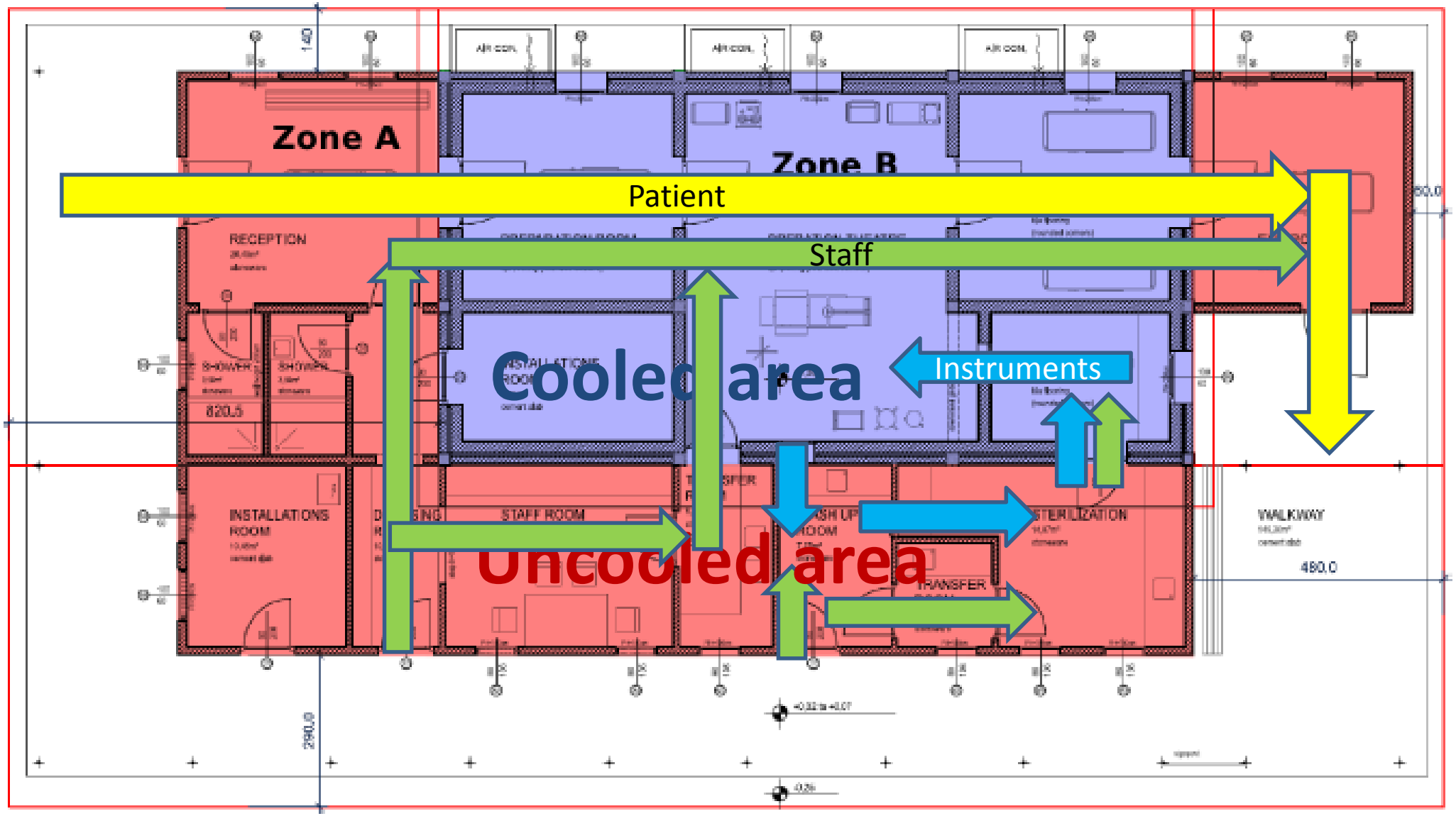

HOPPECKE

Example 2: Operation Theatre

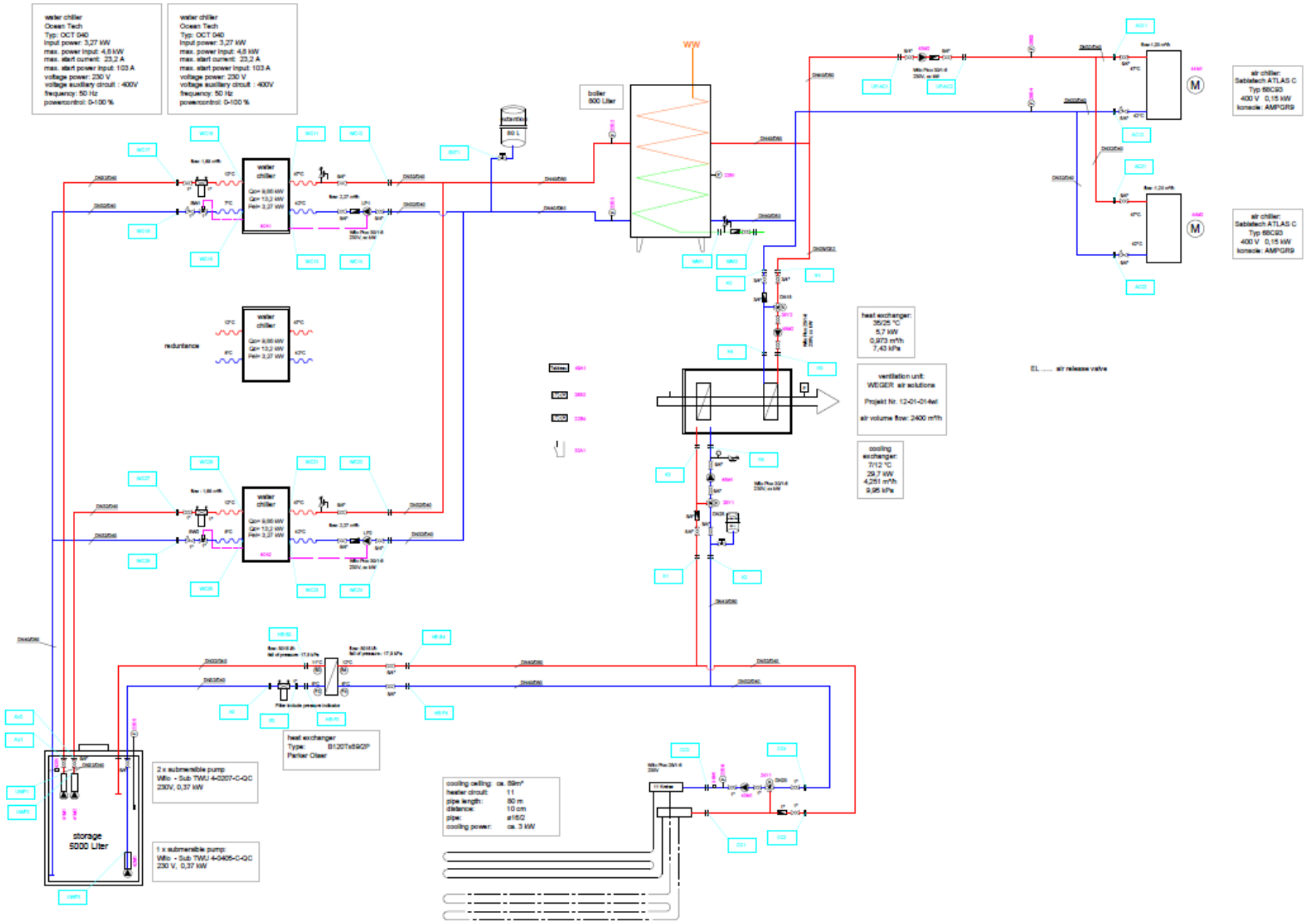
St Francis Hospital, Marial Lou

- Problems:
  - Lack of hygiene
  - Unreliable power supply
  - Harsh environmental conditions
- Solution:
  - Optimized building design
  - Self-sufficient energy supply
  - Innovative cooling concept

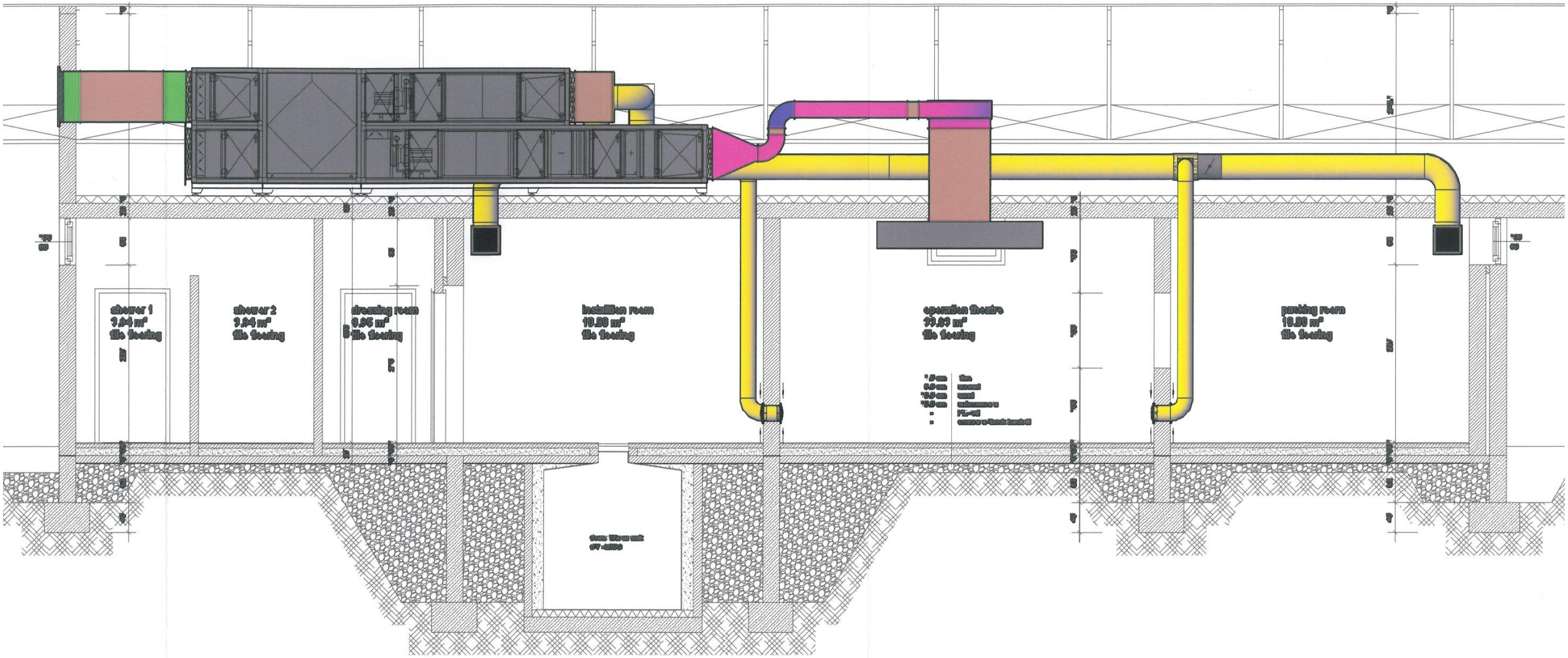

OPERATION
THEATER



St Francis Hospital

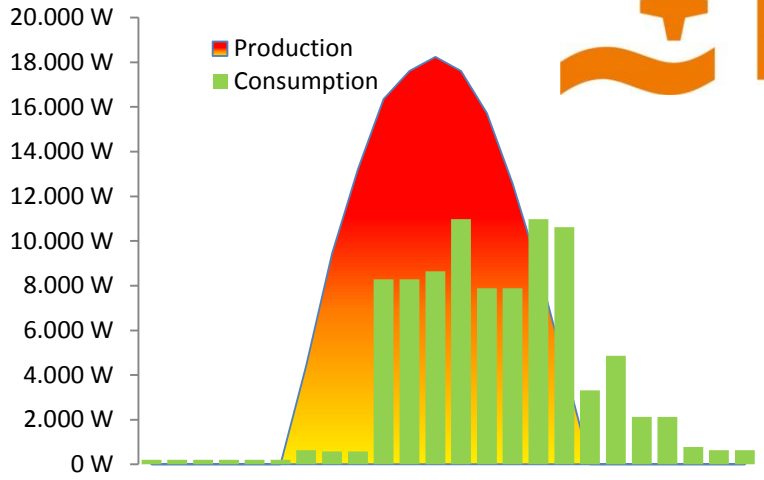


Aircon - system



Aircon - system

120 panels of 235 Wp
= 28.200Wp



BBM

1 x 10 kW Grid inverter 3~
6 x 3 kW Grid inverter 1~

3 x 10.000W
Inverter /Charger

Generator 3~
24 kVA

Industrial battery OpzS
3890 Ah C20 48V

Loads

Cold water set
2 x 3,3 kW

PV hybrid system

Sustainability needs:

- Comprehensive approach
- Long-term cooperation & support
- Continuous trainings
- Capacity & capability building

Thank you for your attention