

# THE USE OF BATTERIES IN A DOMESTIC HOT WATER HEAT PUMP DRIVEN BY PV PANELS

**Prof. Dr. Pedro Vicente Quiles**

Universidad Miguel Hernández de Elche

pedro.vicente@umh.es

<http://dime.umh.e>

**Dipl. Ing. Francisco J. Aguilar Valero**

Universidad Miguel Hernández de Elche

**Dipl. Ing. Simón Aledo Vives**

simon@printer.es

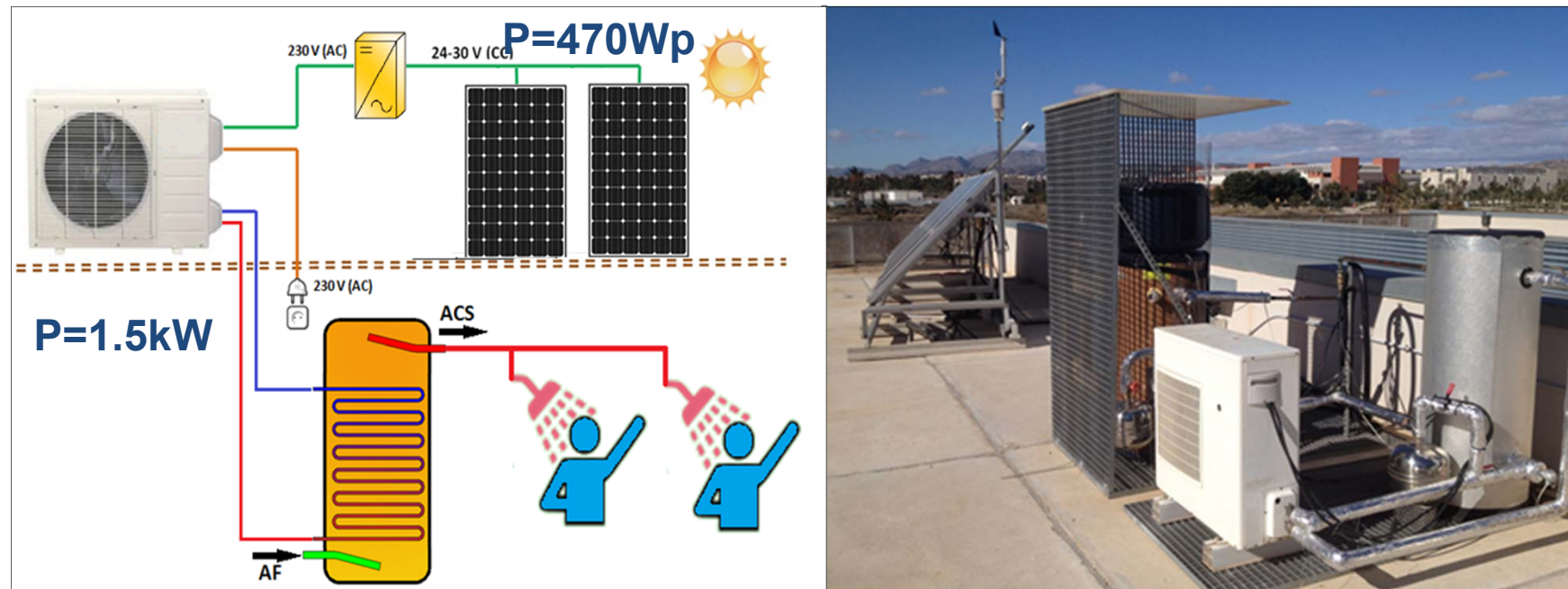
Printer, S.L.

# 1. Objectives of the study

- a) To analyze the possibility of using batteries in PV supported systems
- b) To show the real possibilities of DHW production with a heat pump with PV support and batteries.
- c) To collect experimental data to calibrate future numerical simulations of DHW production systems by heat pumps + photovoltaics + batteries

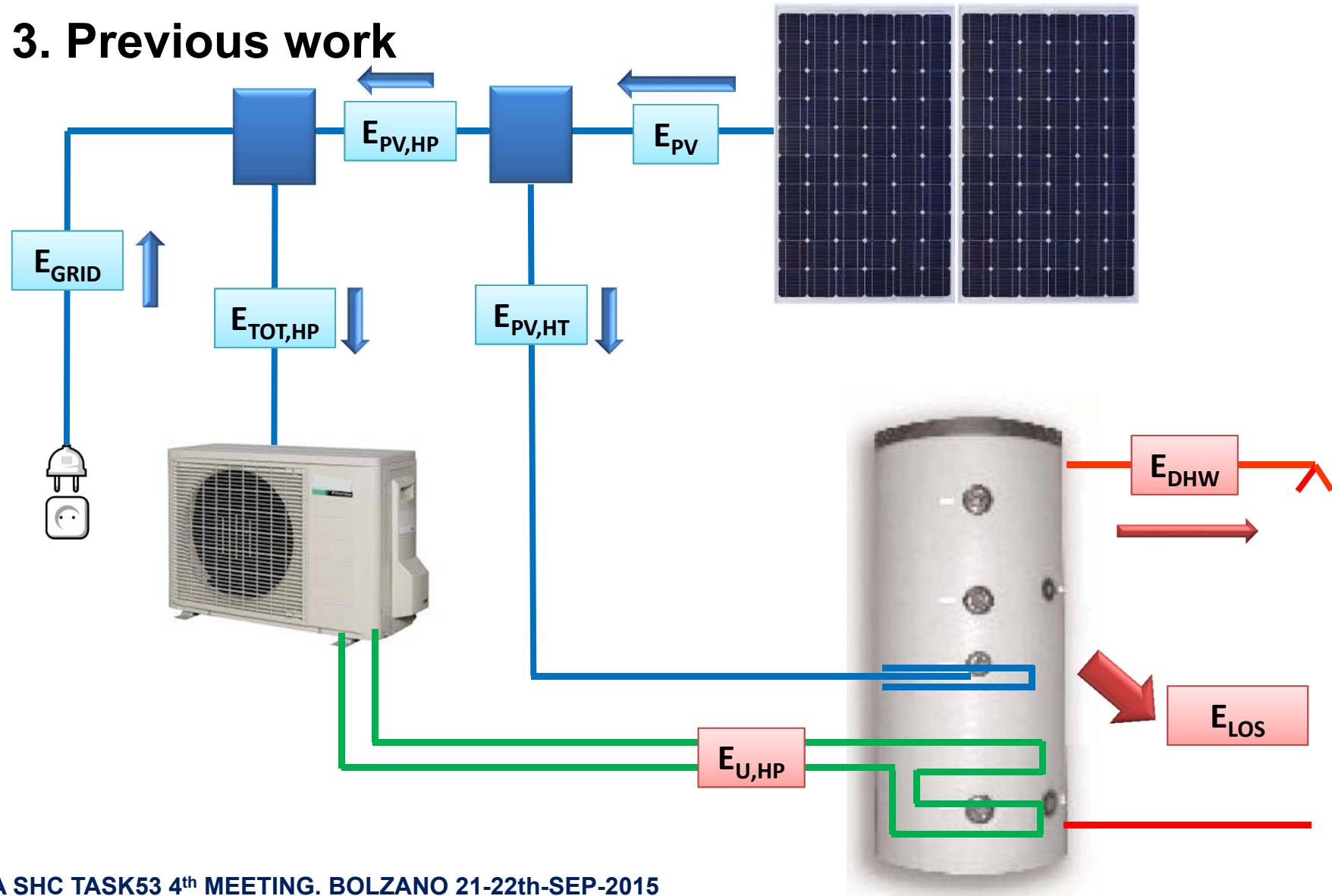
## 2. Experimental facility

The experimental facility was set up on the roof of a Miguel Hernández University building

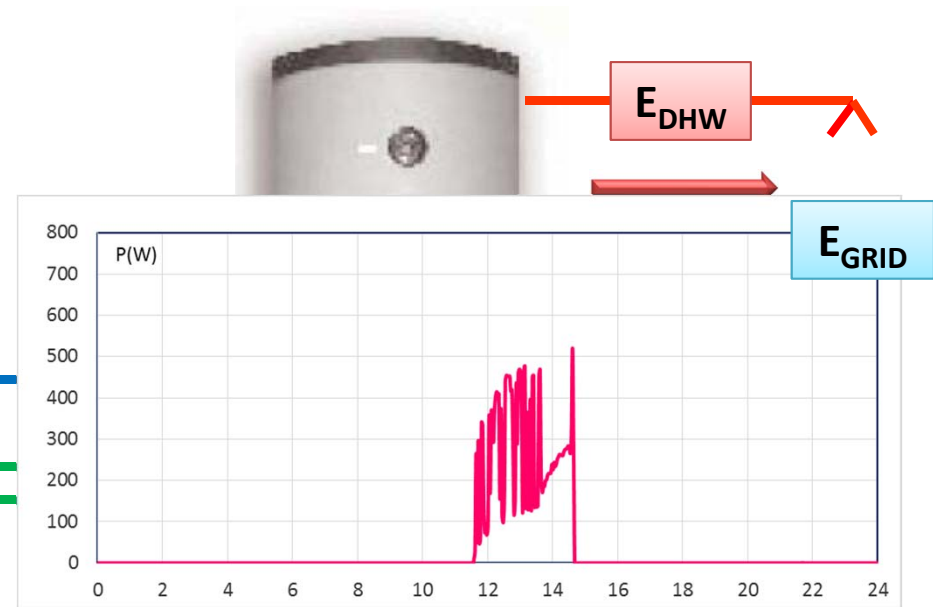
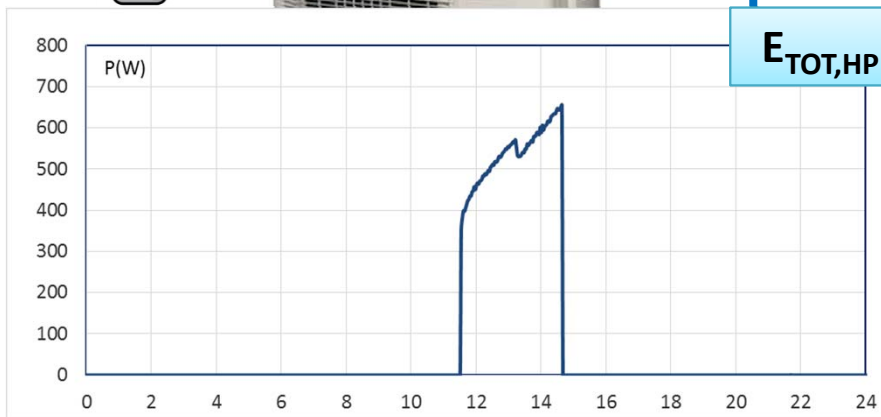
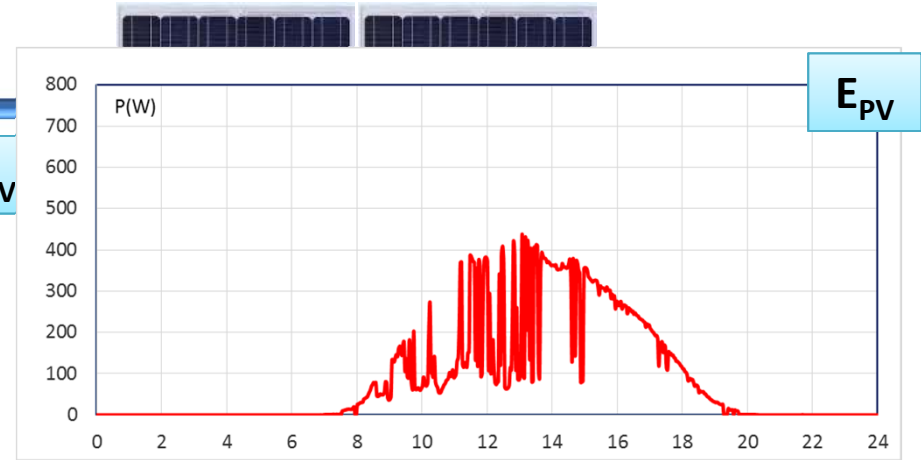
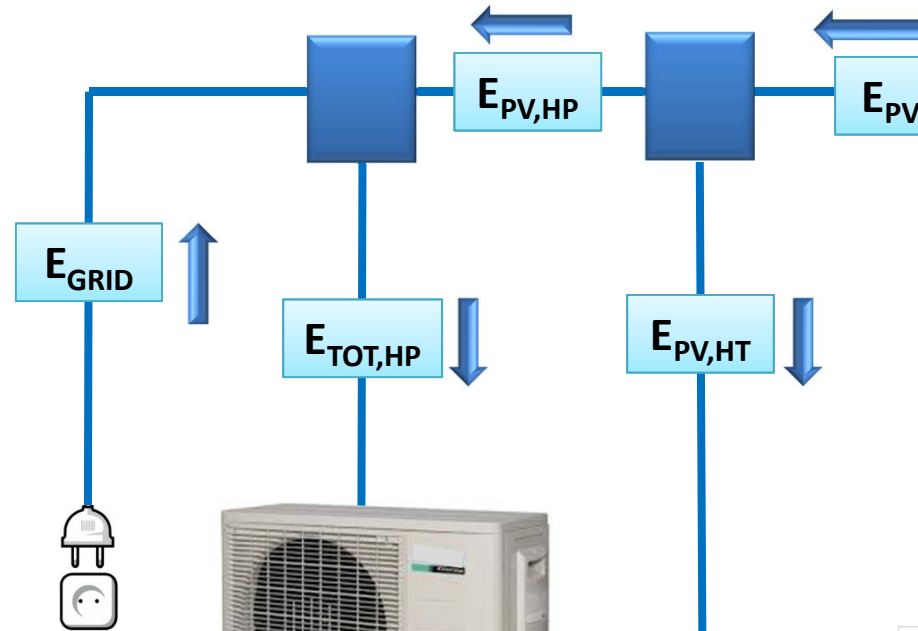


DHW consumption of a 4 membered family

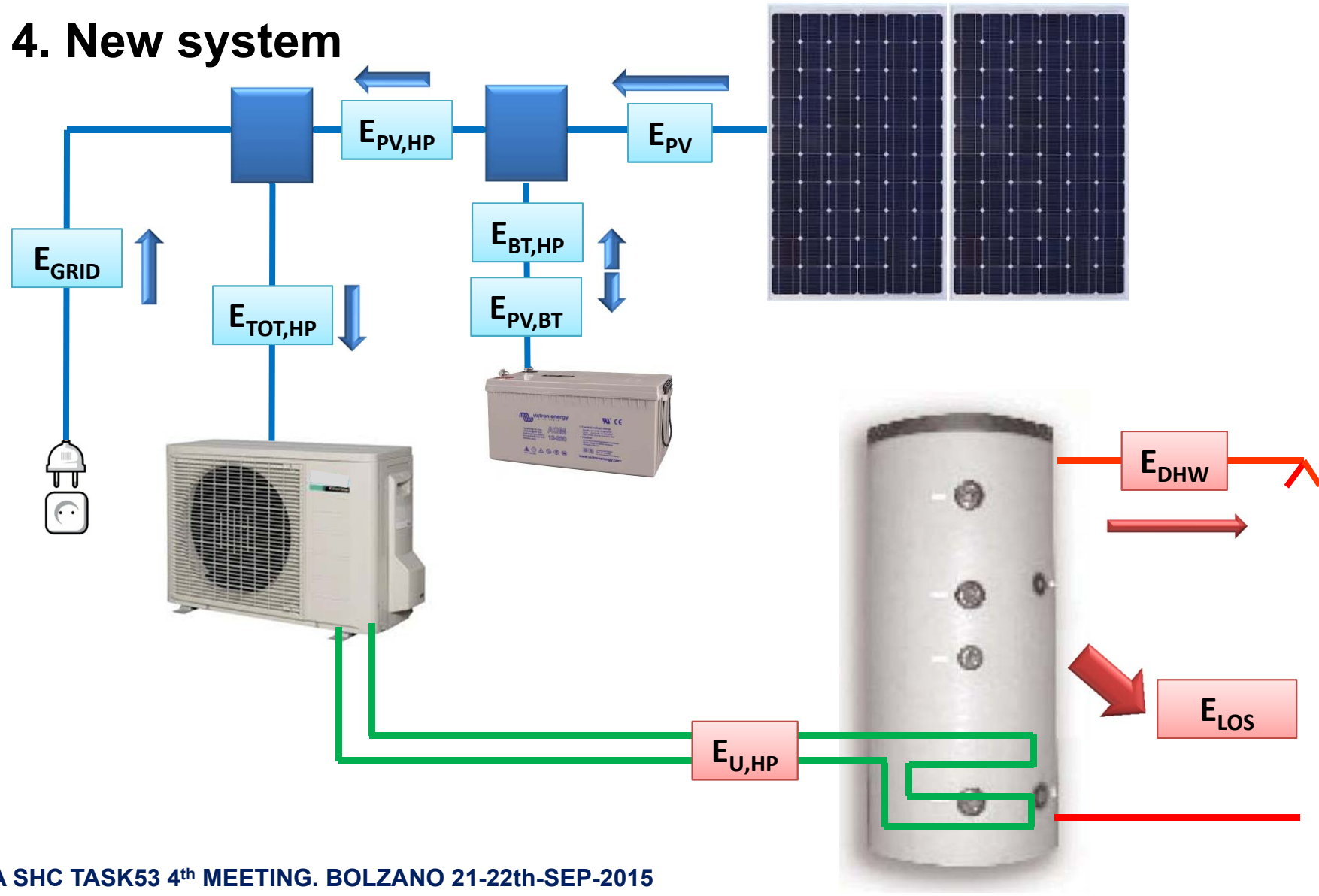
### 3. Previous work



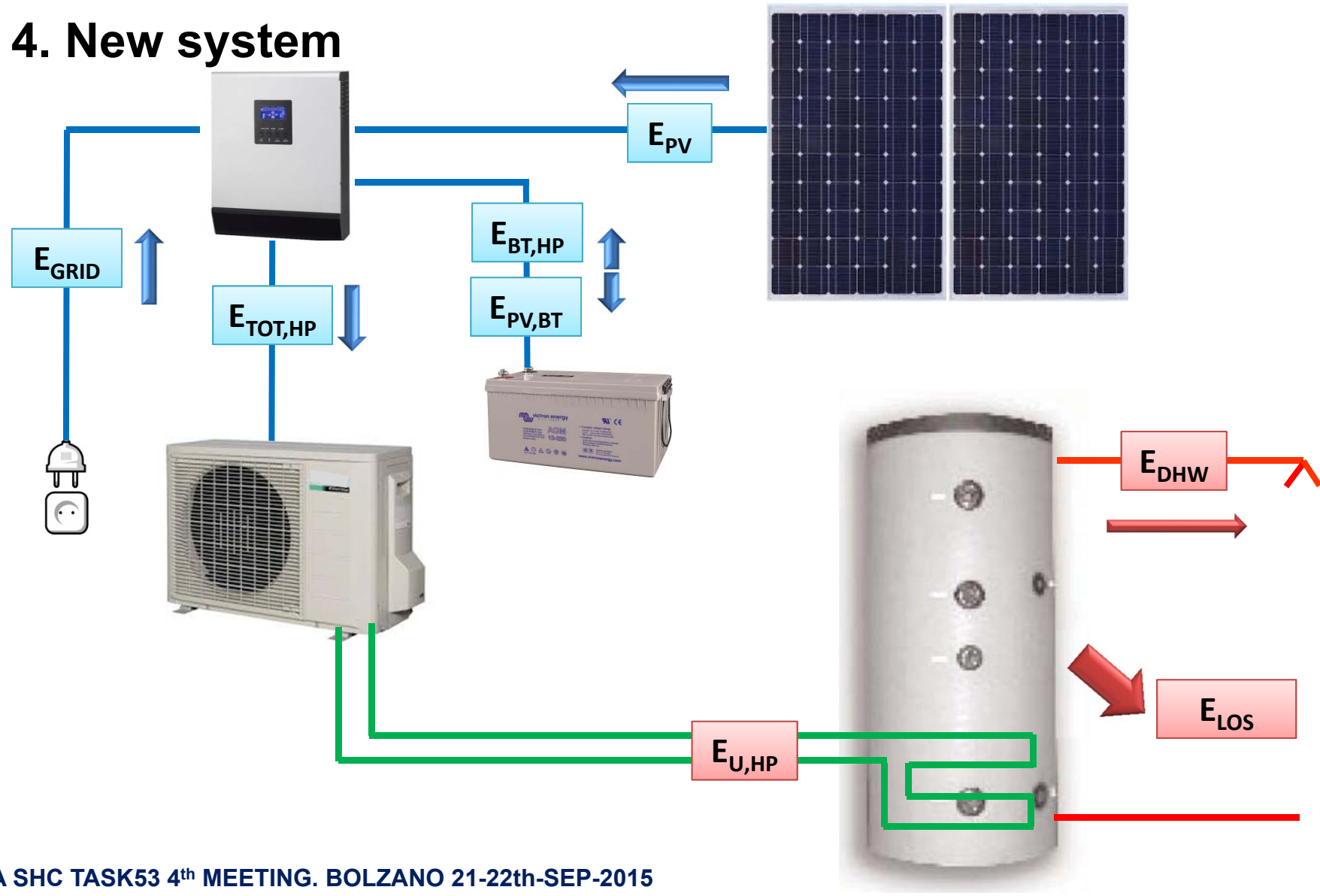
### 3. Previous work



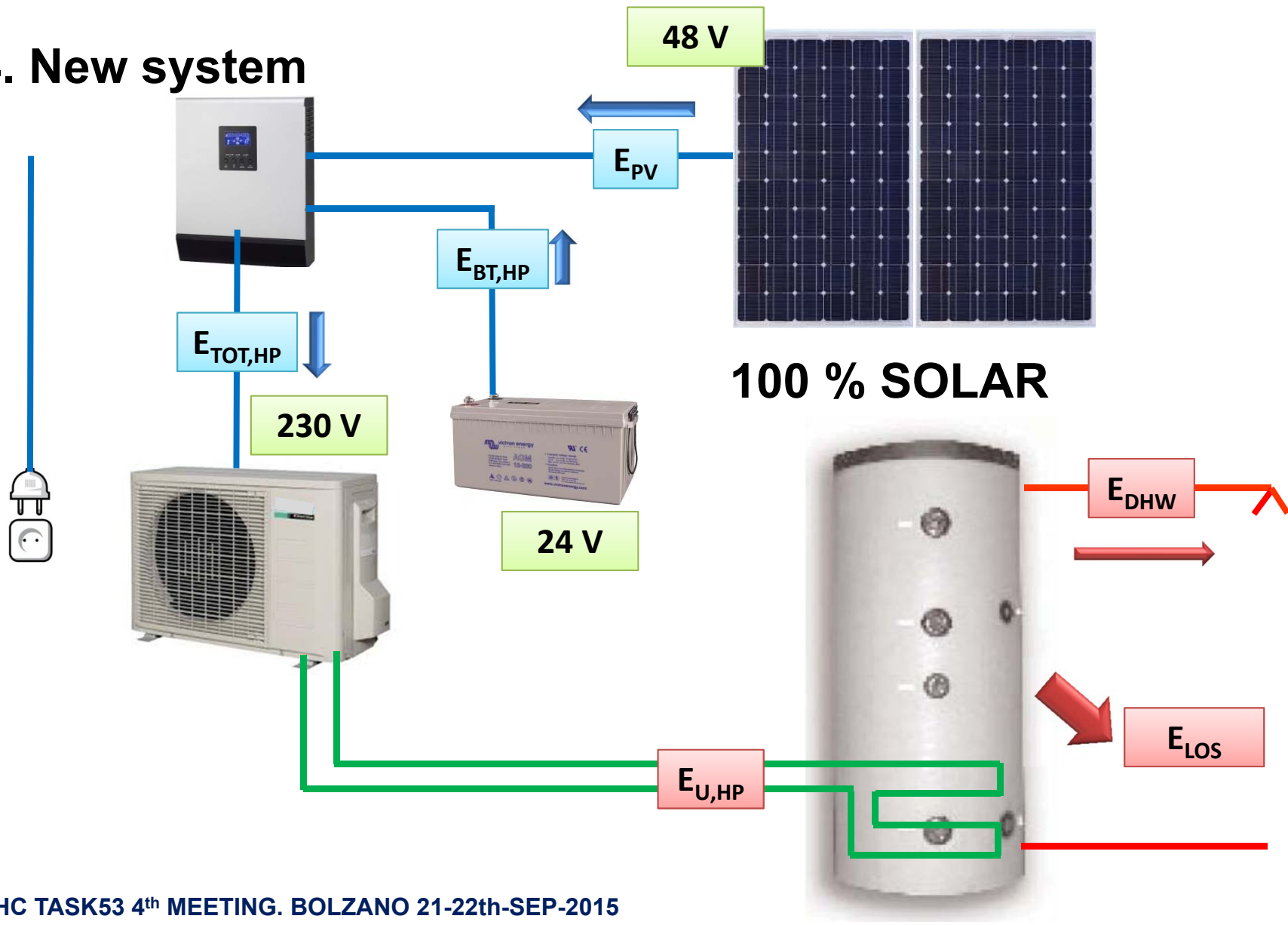
## 4. New system



## 4. New system

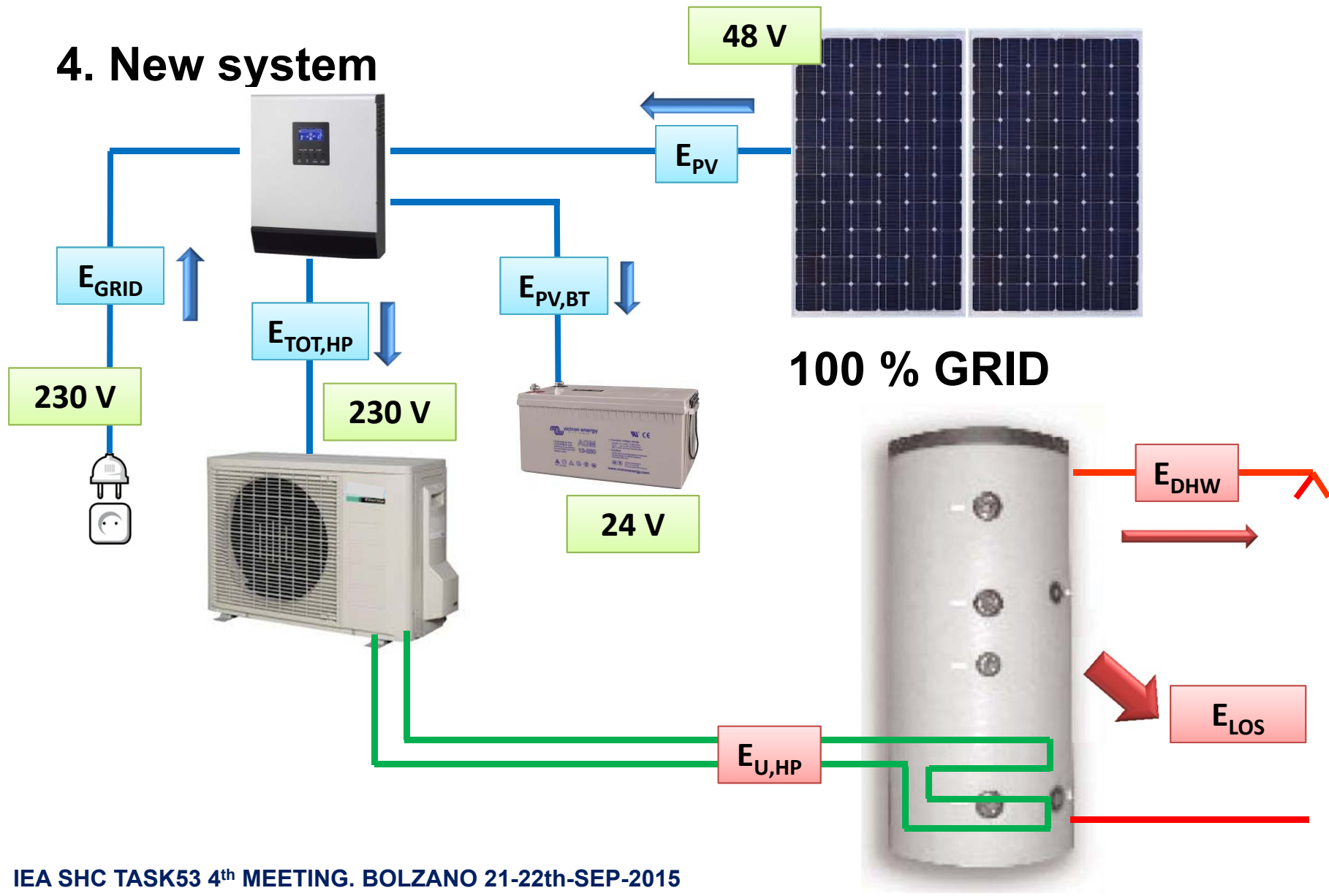


## 4. New system

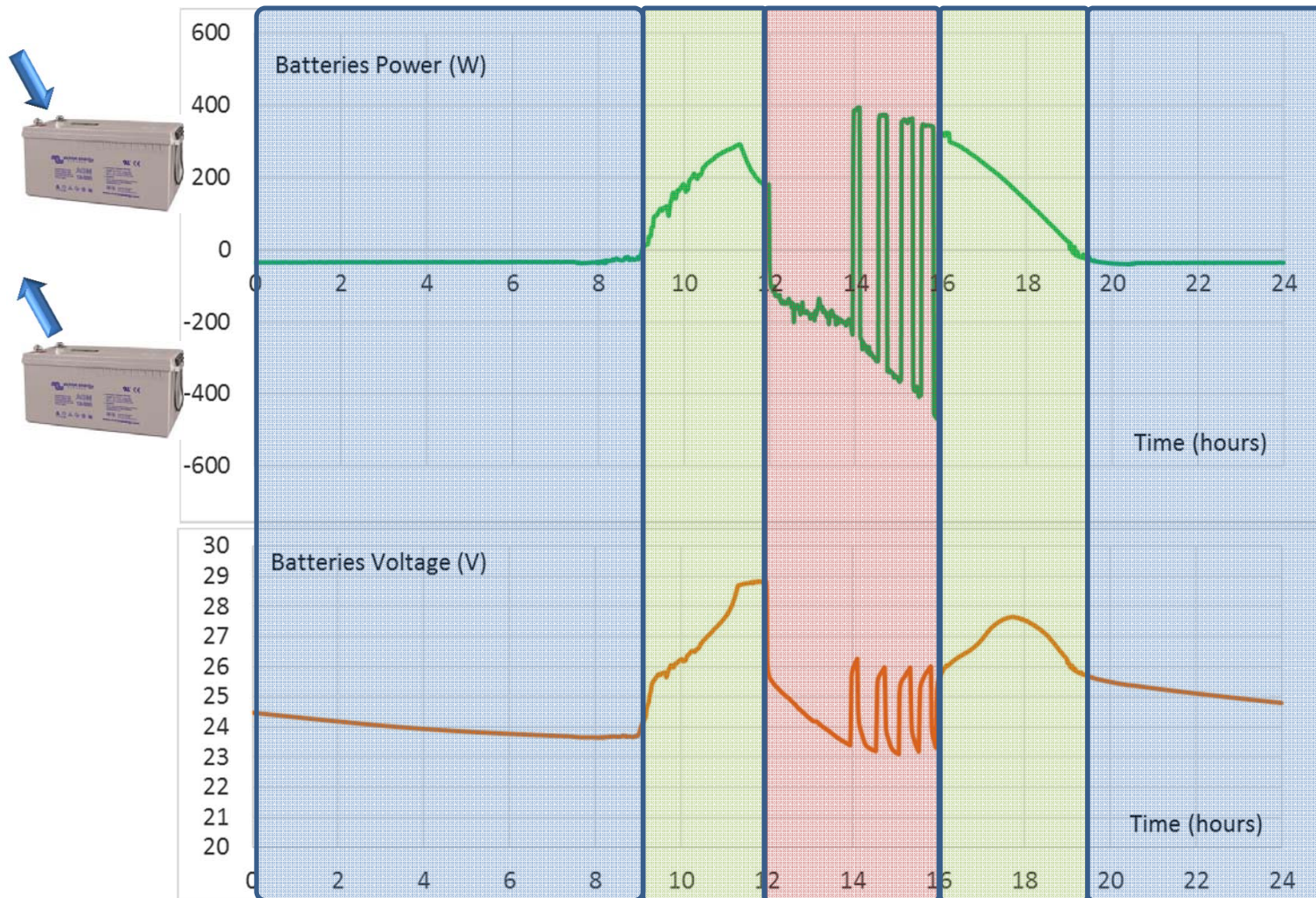


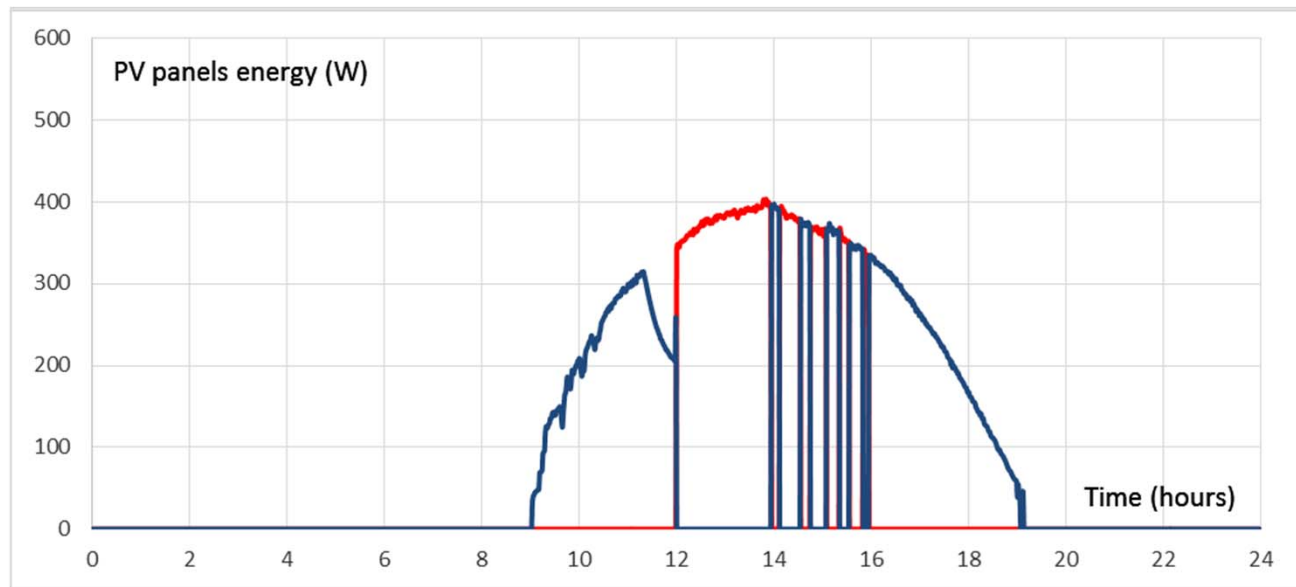
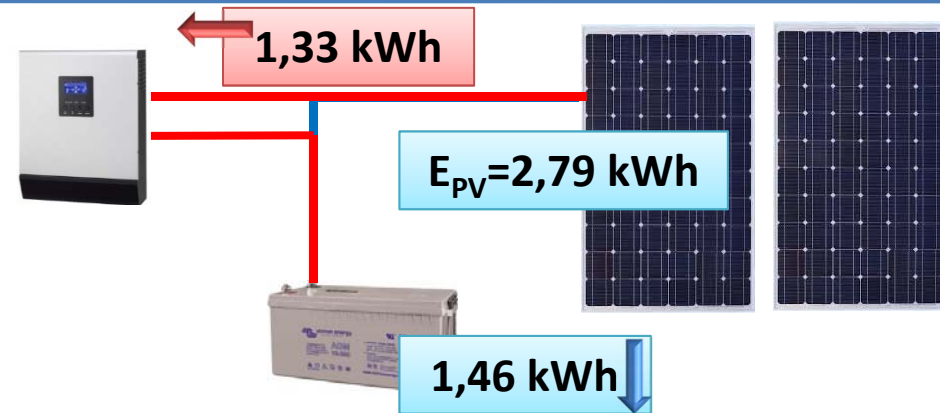


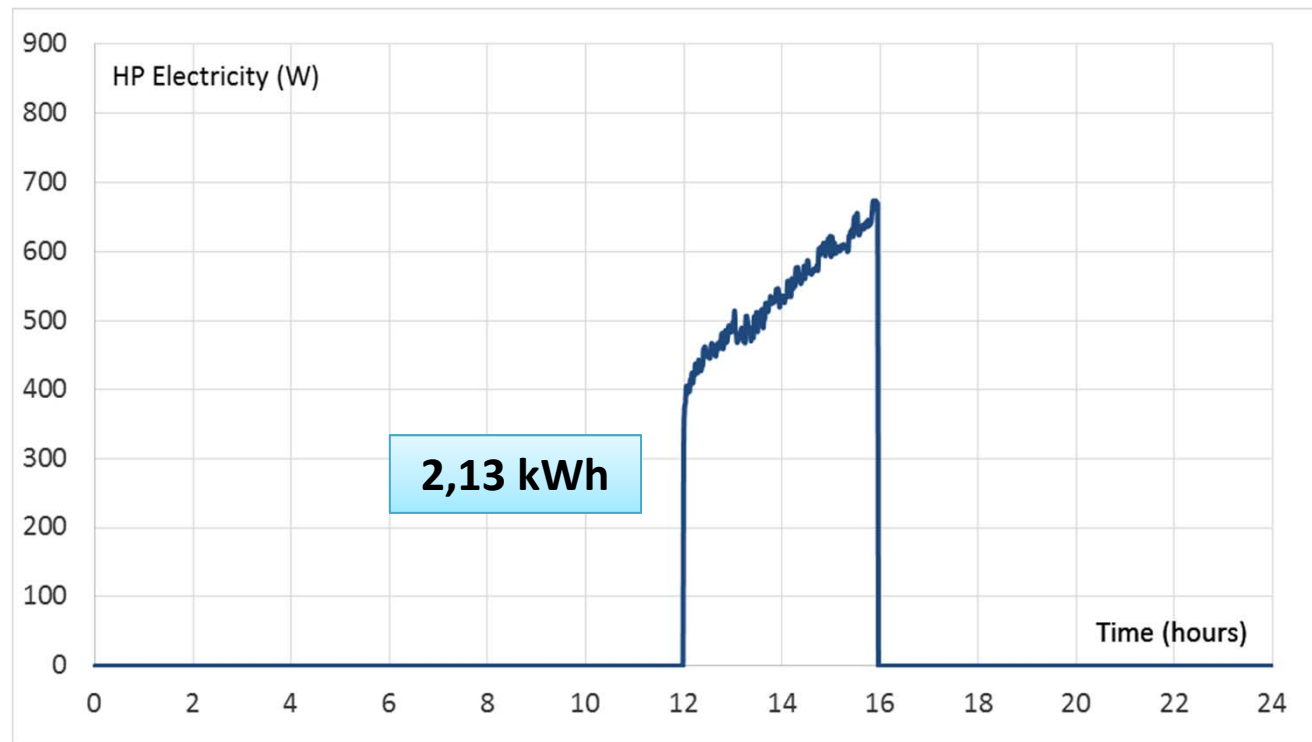
## 4. New system

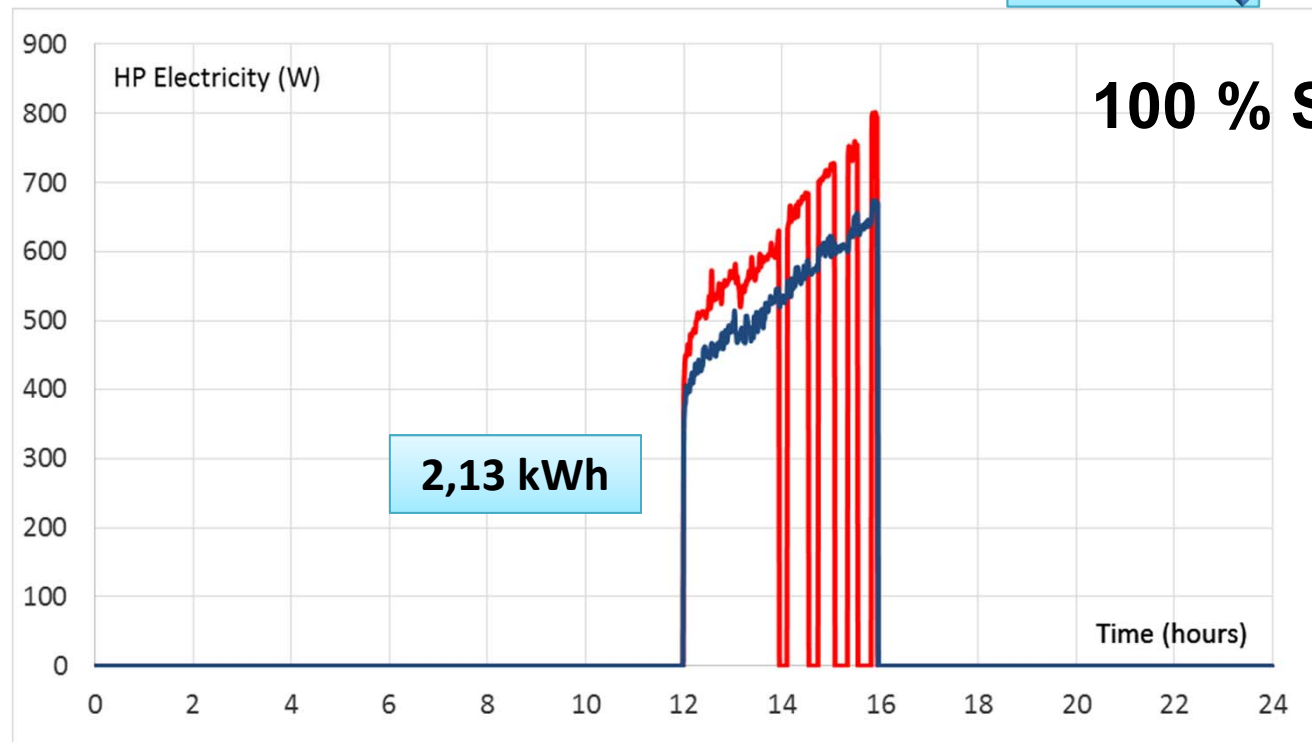
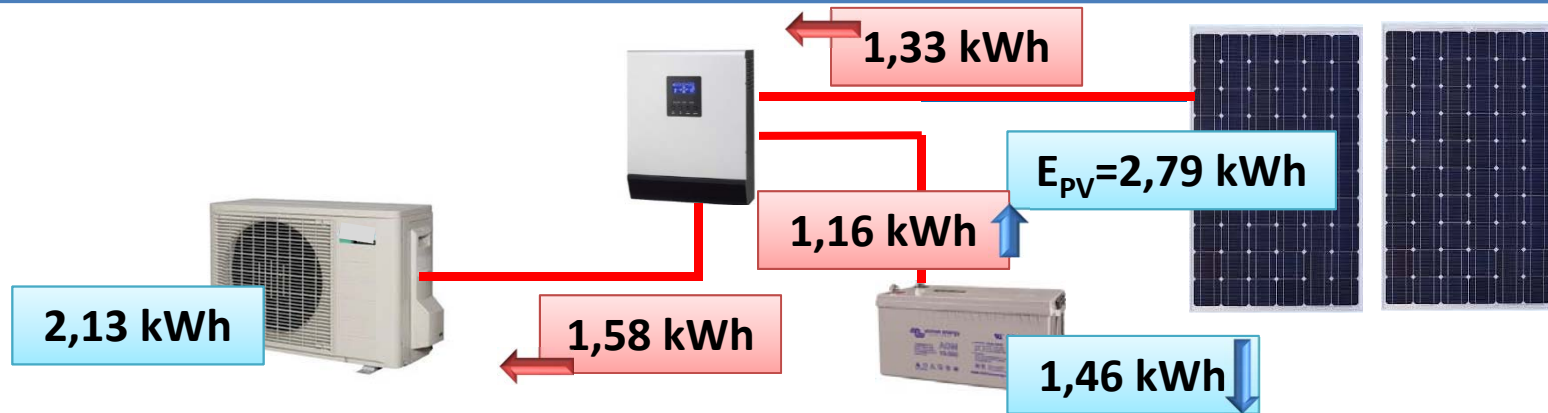


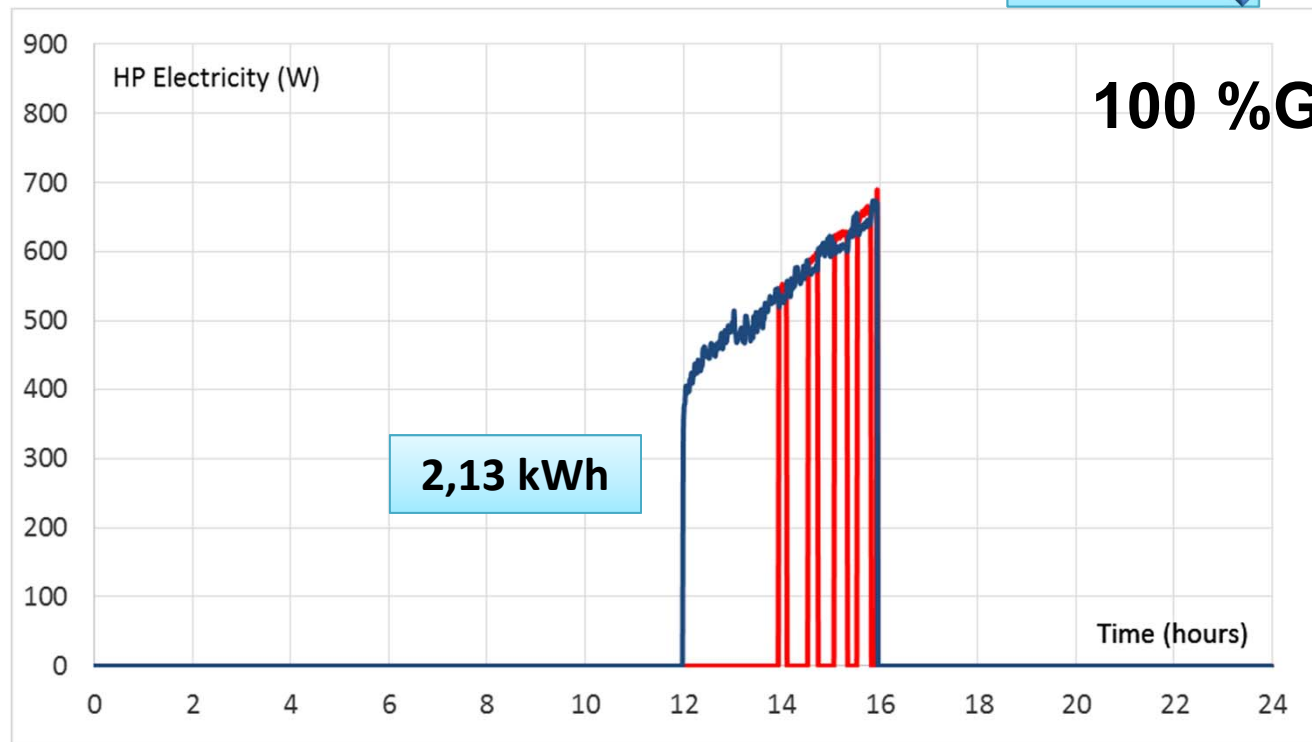
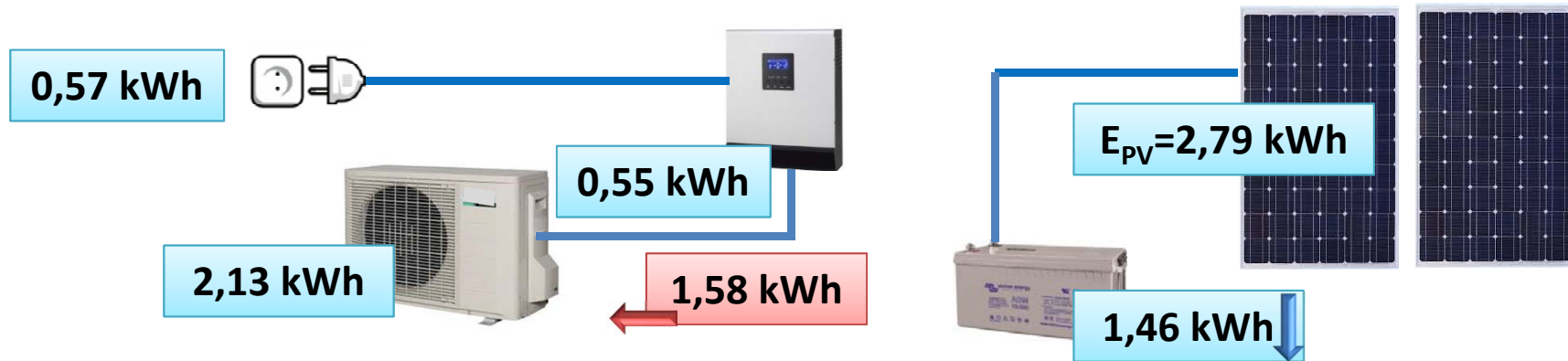
16/SEP/2015



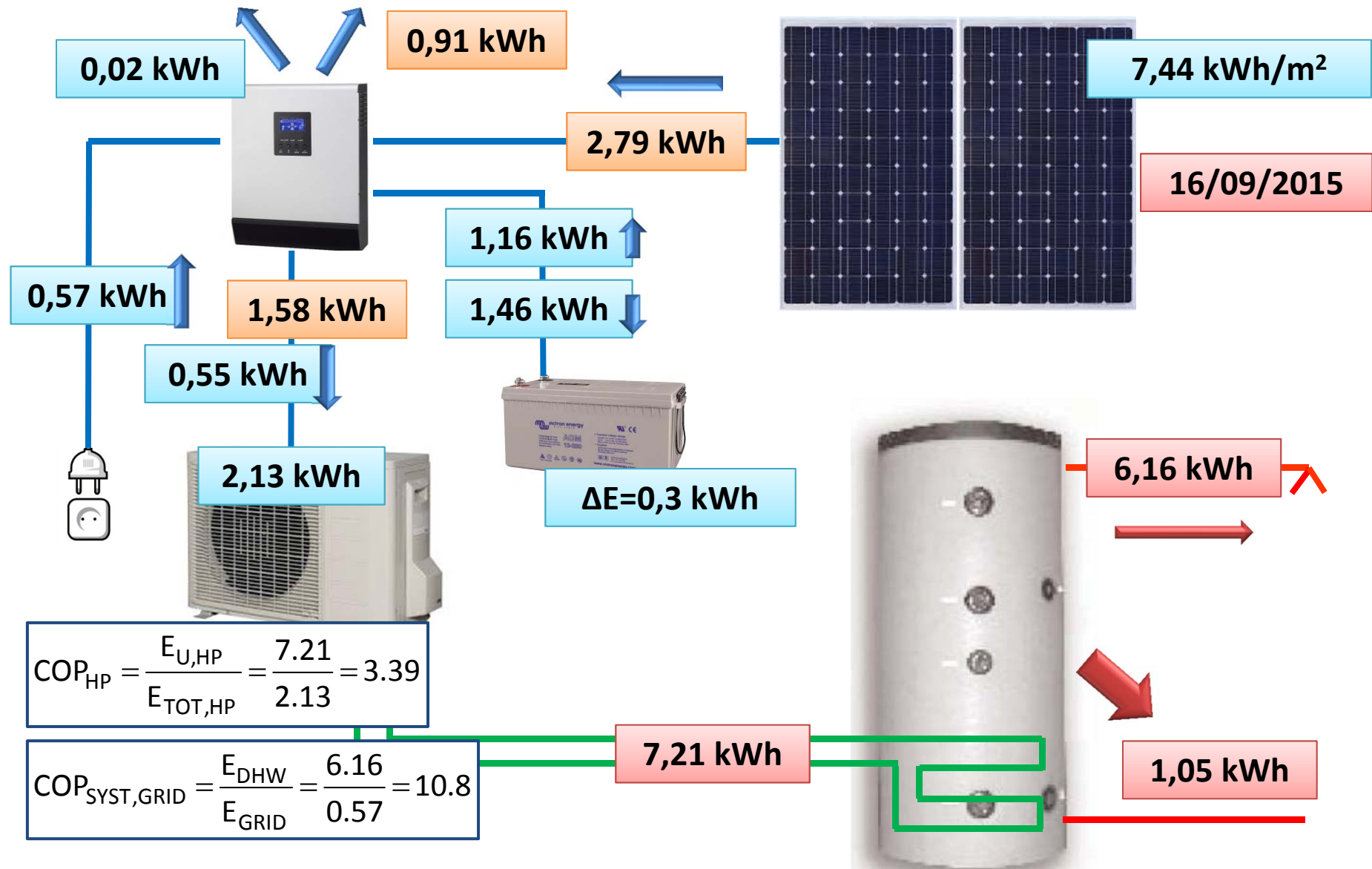


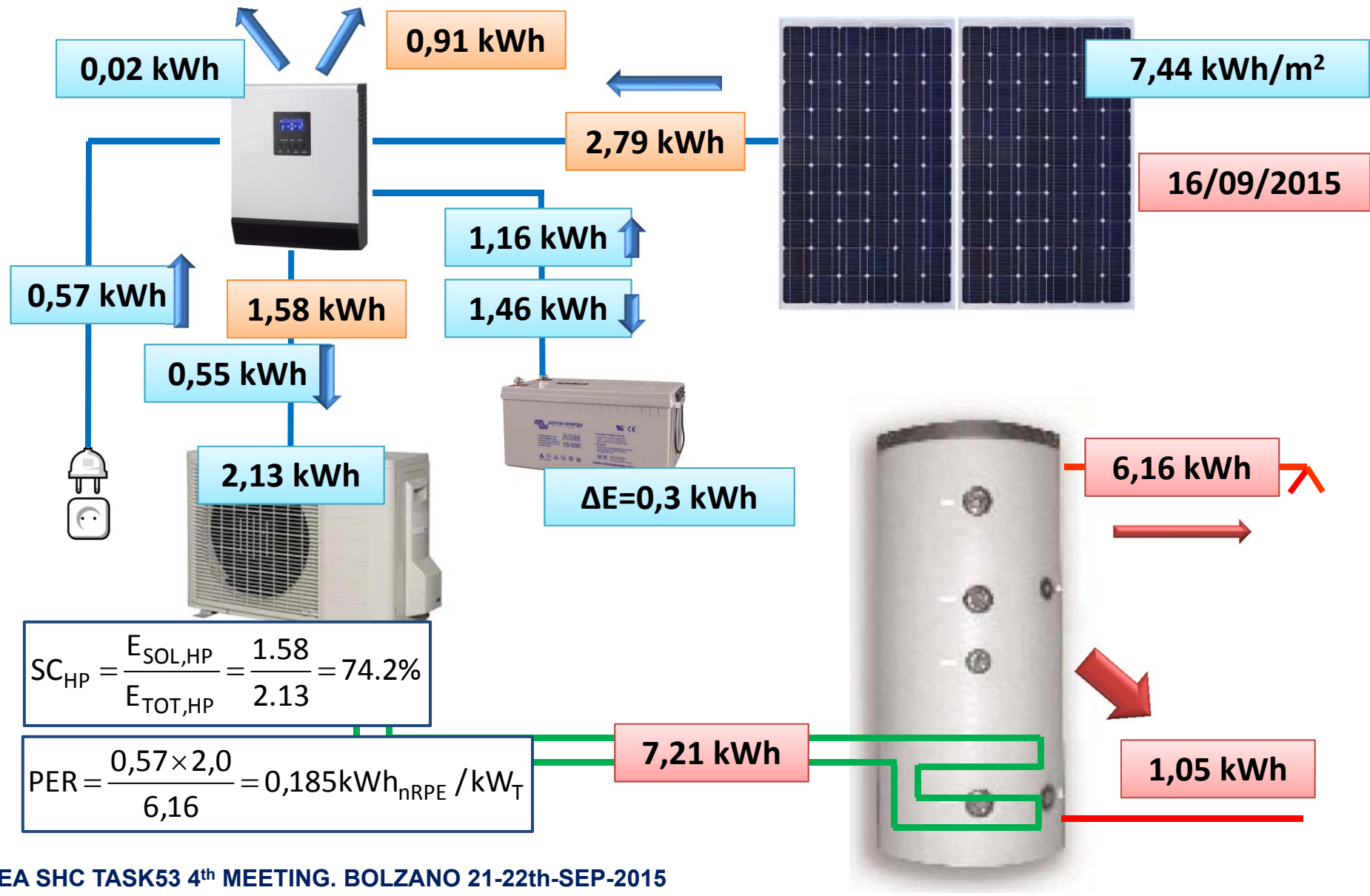






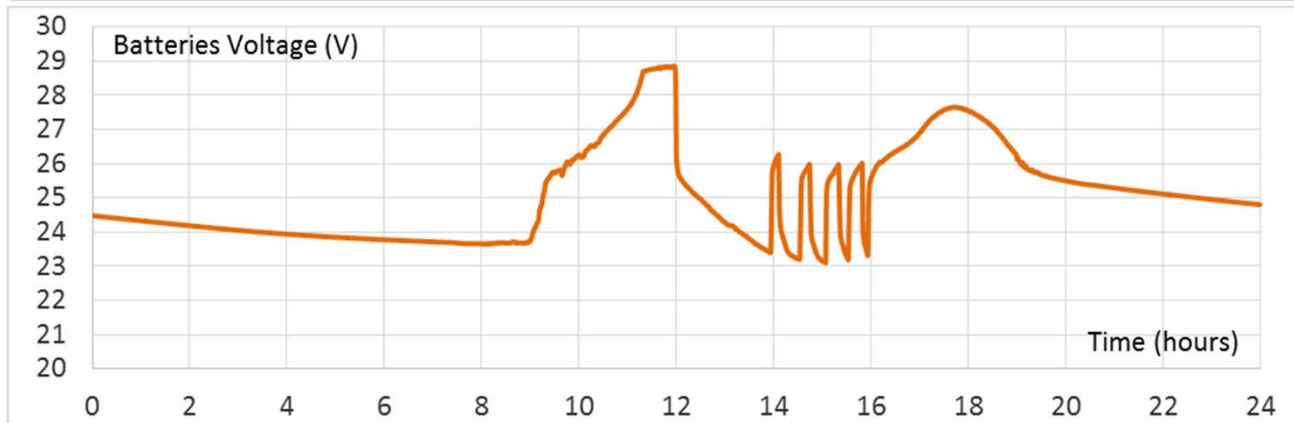
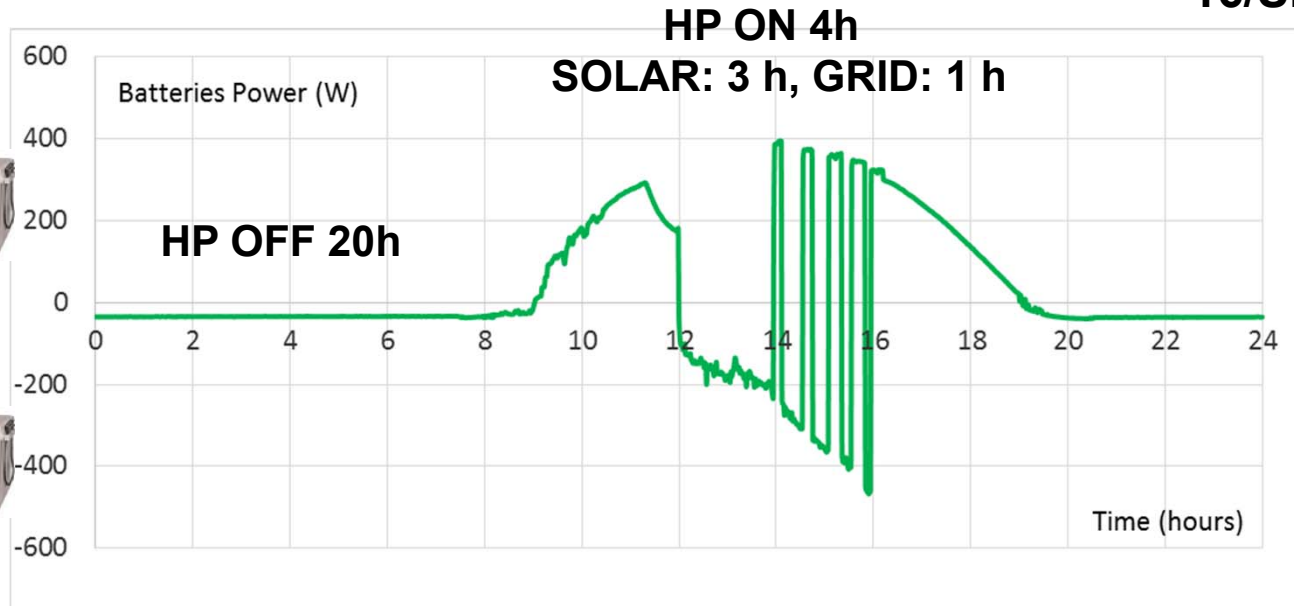
**100 % GRID**



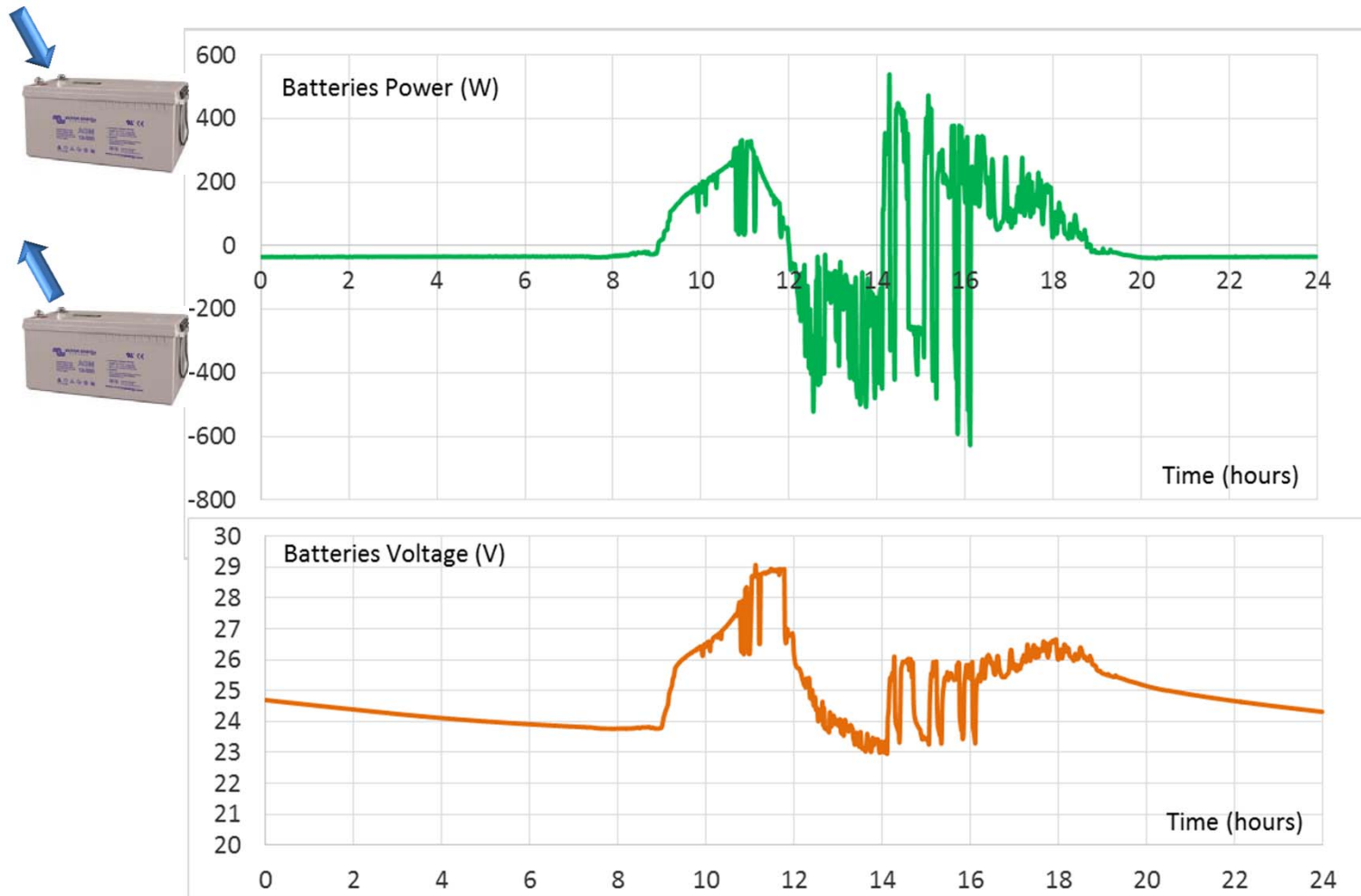




16/SEP/2015



18/SEP/2015



## OPEN QUESTIONS

Design parameters:

- Tank volume
- Batteries capacity
- Heat pump power
- Control system
  - Heat pump ON/OFF
  - Batteries. SOLAR/GRID mode

Efficiency, economic cost, environmental cost

# THE USE OF BATTERIES IN A DOMESTIC HOT WATER HEAT PUMP DRIVEN BY PV PANELS

**Prof. Dr. Pedro Vicente Quiles**

Universidad Miguel Hernández de Elche

pedro.vicente@umh.es

<http://dime.umh.e>

**Dipl. Ing. Francisco J. Aguilar Valero**

Universidad Miguel Hernández de Elche

**Dipl. Ing. Simón Aledo Vives**

simon@printer.es

Printer, S.L.