



**Building a better world through  
innovation in solar energy**

**Res4Med – Rabat, 9<sup>th</sup> March 2016**

[www.airlightenergy.com](http://www.airlightenergy.com)  
[federico.micheli@airlightenergy.com](mailto:federico.micheli@airlightenergy.com)

# Who is Airlight Energy

Airlight Energy is a Swiss private company that supplies **proprietary solar technologies** for **large-scale** production of electricity and thermal energy, and for energy storage

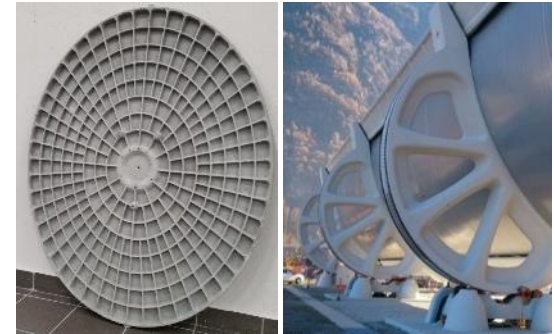
## Concentrated Solar Power - CSP plant in Ait Baha, Morocco



airlight energy

- 2 basic elements:  
air and concrete
- High local  
content

**synrocks**  
an airlight energy company



## Materials

- Substitute steel and aluminum  
with concrete based products  
maintaining comparable  
performances at significantly  
lower costs
- 1 batching plant in Ait-Baha,  
Morocco

**dsolar**  
an airlight energy company

- High concentration  
photovoltaic-thermal
- Distributed generation



## Polygeneration Pilot plant in Biasca, Switzerland

# The Ait Baha CSP Plant - First ALE CSP for power production in Morocco to use air as thermal vector

CSP booster plant with ALE technology developed in partnership with Italcementi



- Integration into existing cement factory
- The heat captured through the solar modules is added to the one recovered by the cement production process

- 3 solar modules (216 x 11 meters)
- 6,055 m<sup>2</sup> of total reflecting surface
- 2400 kWh/m<sup>2</sup>/year solar resource
- 2390 MWh/year **electricity generation** (est.)

## Performance roadmap

30.03.2016

30.06.2016

30.07.2016

Intermediate certification:  
60% of the plant is certified

Plant fully commissioned  
at 100% performance

Full plant certification



# A new concept in concentrating solar technologies

## "Our 5" major innovations

### Air-based receiver

**Air:** Operate up to **570°**  
Non-polluting fluid



### Fiber-reinforced concrete structure

**Concrete:** durable, inexpensive,  
locally available material



### Film mirrors

**Aluminum foils:** simple manufacturing  
Low cost per aperture area



### ETFE pneumatic enclosure

**No dust** and **low humidity** inside  
Total **water recovery**



### Packed-bed thermal energy storage

**Rocks:** inexpensive, locally available  
material  
Low thermal losses



## State-of-the-Art

### Oil/ molten salts receiver

Potentially polluting and  
expensive thermal fluid



### Aluminium structure

Expensive construction  
material



### Glass mirrors

Expensive  
Fragile



### No cover

Wasting of water  
Exposure to  
environmental conditions



### Oil/ molten salts storage

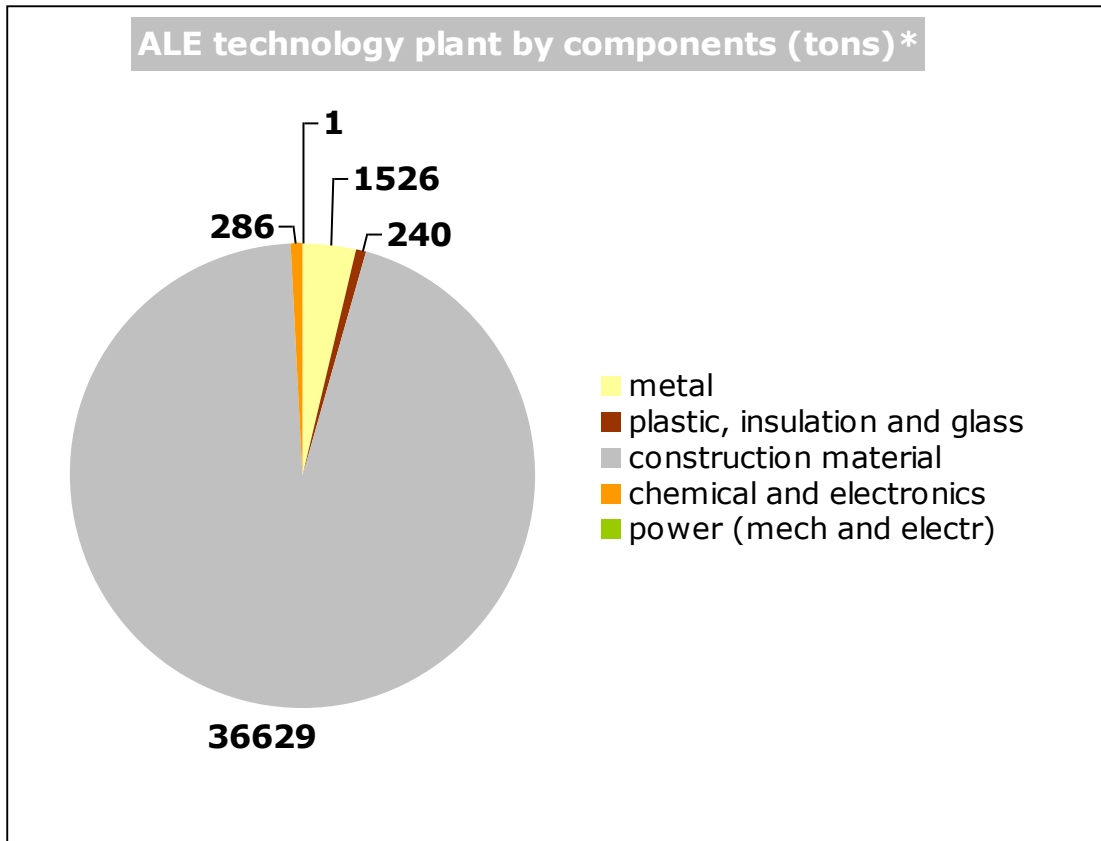
Potentially polluting  
Chemical instability



# The local content – local value generation

Among the components of the CSP plant, construction materials (e.g.: cement) are the most important one, especially for collectors, storage, and power generation block.

The second most important one is metal, especially in receivers (namely: carbon steel).



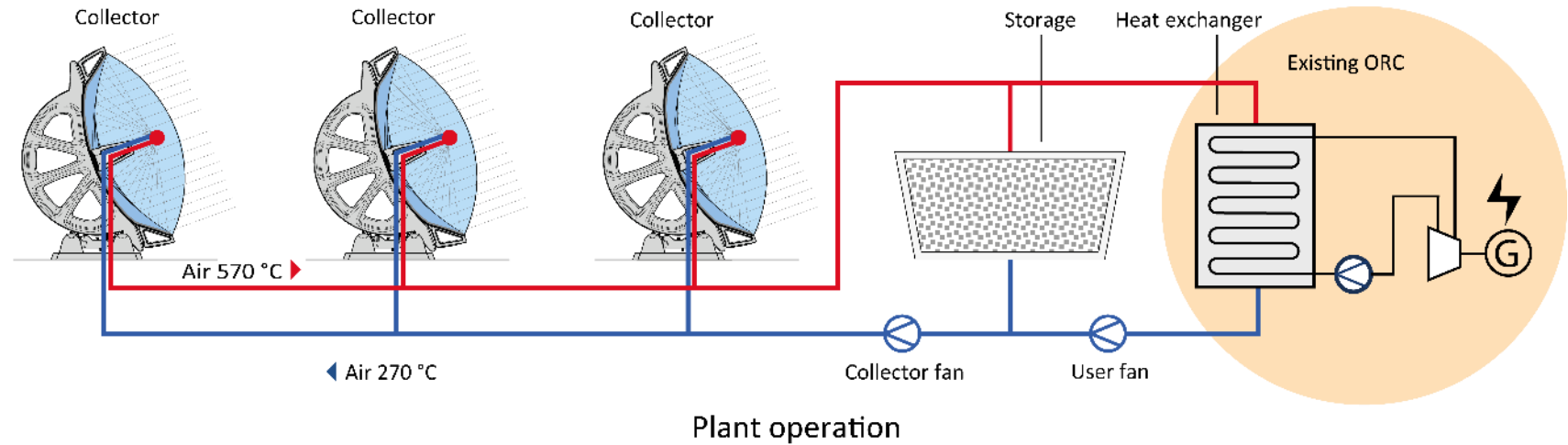
\* Reference: a 5MW, 18 collectors plant;

Components of a ALE technology plant include more local materials than other CSP plants.

ALE technology has a huge potential for development of a fully local solar industry.

- The construction materials are also the components with highest local value, followed by metal and piping
- These components are particularly used in collectors and storage where 100% of construction materials is local
- Other components (insulation materials, electronics, plastic etc.) may become local in the longer term as solar industry development boost these productions

# CSP Booster plant layout and integration with existing process



Schematic example for CSP plant, Ait-Baha, Morocco

Partners



**ETH**

Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich

