4th Meeting of the Platform for Coal Regions in Transition

Breakout session on "Energy Storage"

Thermal and Cryogenic Storage Projects in Asturias

Monday 8 April, 16:40 – 18:30

Borschette Center, Brussels

TSK

"Growth through innovation"

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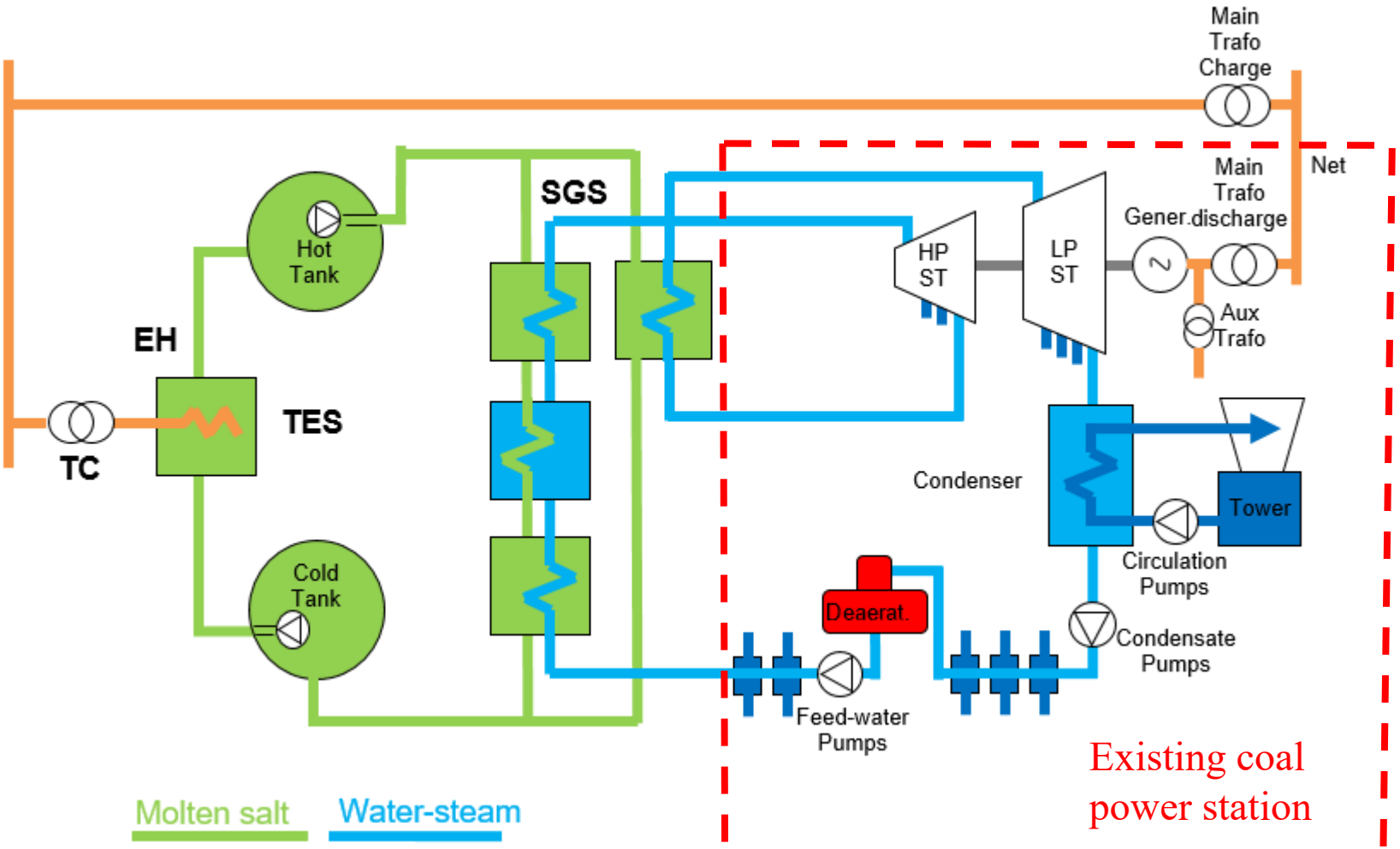
- Molten Salt Thermal Energy Storage
- Liquid Air Energy Storage

MOLTEN SALT THERMAL ENERGY STORAGE:



Growth through innovation

MOLTEN SALT THERMAL ENERGY STORAGE:

Project

Energy storage plant based on molten salts.

Cost

Total	Year 1	Year 2	Year 3	Year 4
201 M€	141 M€	60 M€		

Period

Immediately

Minimum support required

50% of the project

Partners

Leader: TSK

Other partners: -

Description

"Aboño I" power station boiler replacement with an energy storage system consisting of molten salt electrical heaters, storage system and steam generation system that allows electric charge and discharge from the net.
Charge/discharge power: **358 MW**
Storage hours: **2h**
Mature technology with the exception of the electrical heaters, that are being tested within ongoing R&D projects.

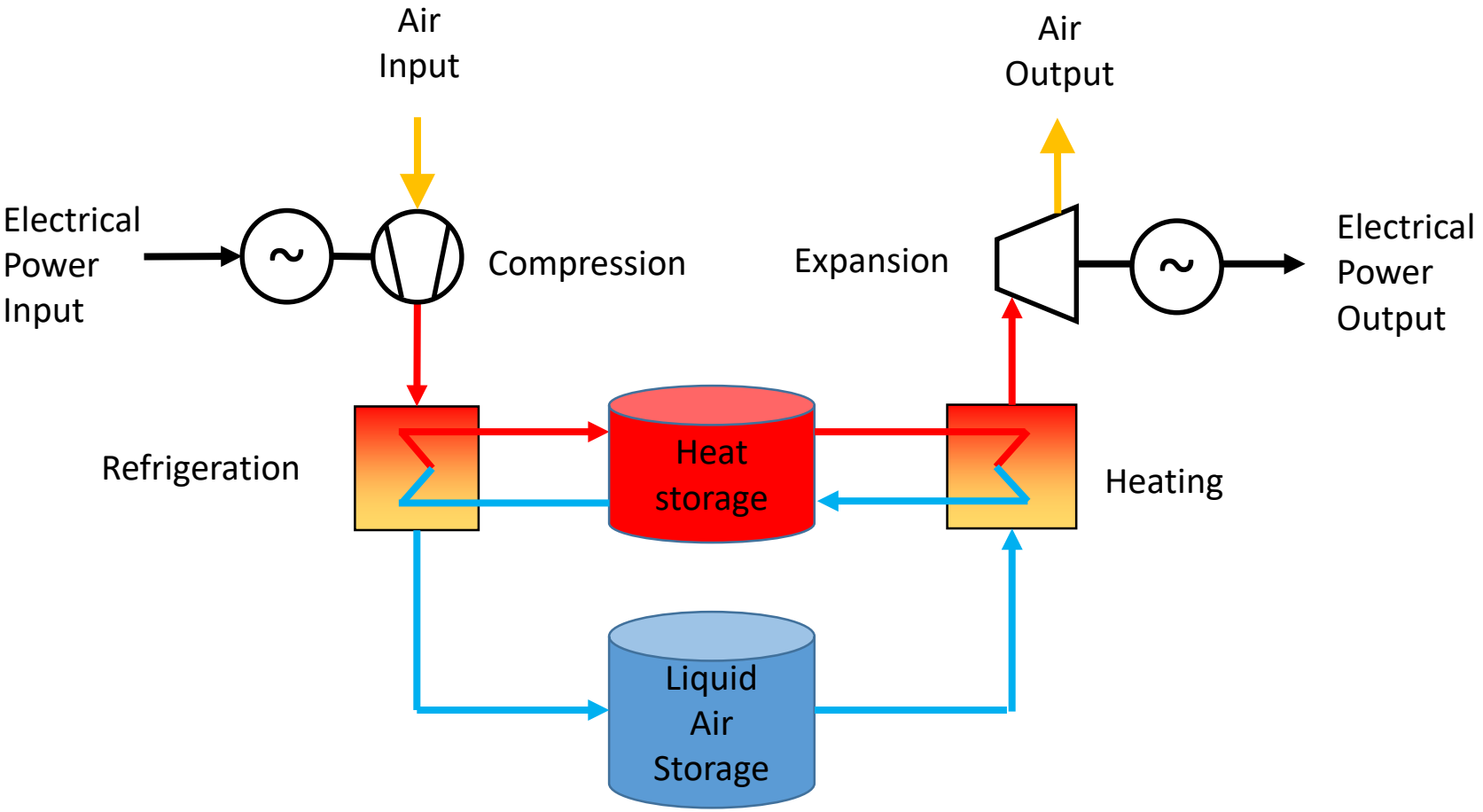
Employment

Construction phase: 300 workers in average
O&M phase: **50 workers**

Expected impact

- **Subcontracting of asturian companies.**
- Power absorption of 358 MW from net.
- Power contribution of 358 MW to net.
- Annual dispatch of 500 GWh of electric power.
- **Avoid the dismantling of "*Aboño I*" cycle.**
- **Reference project** for others in Spain and Europe.

LIQUID AIR ENERGY STORAGE:



See video at: https://www.youtube.com/watch?v=7RdGylQxbbA

LIQUID AIR ENERGY STORAGE:

Project

Energy storage plant based on liquid air.
(Prototype 5h x 50MW)

Description

Installation of an energy storage system consisting of compressors, refrigerators, storage tanks (molten salts, water and liquid air), heaters and turbines, in the place of a dismantled power station, where a net conection exists.
Charge power: **25 MW**
Storage hours: **5h**
Discharge power: **50 MW**
Mature technology: prototype plants proven.

Cost

Total	Year 1	Year 2	Year 3	Year 4
73 M€	51 M€	22 M€		

Period

6 months prior project start

Minimum support required

50% of the project

Employment

Construction phase: 200 workers in average
O&M phase: **30 workers**

Partners

Leader: TSK

Other partners: -

Expected impact

- **Subcontracting of asturian companies**.
- Power absorption of 25 MW from net.
- Power contribution of 50 MW to net.
- Annual dispatch of 100 GWh of electric power.
- **Reference project** for others in Spain and Europe.

MOLTEN SALT AND LIQUID AIR THERMAL ENERGY STORAGE:

ADVANTAGES:

- Does not use **critical** materials (like litium, vanadium, etc.).
- No **degradation**: No need to renew storage elements.
- Does not generate **residuals** to be processed.
- Subcontracting with **local suppliers**. O&M with **local personal**.
- **No technology risk**: Proven tecnologies (MSES comercial in thermosolar, LAES tested on 2 prototypes).
- Molten salt termal energy store **reuses old coal power stations.**
- **Site independent.**

DISADVANTAGES:

- Relatively low **global efficiency** (44% for MSES, 60% for LAES)