

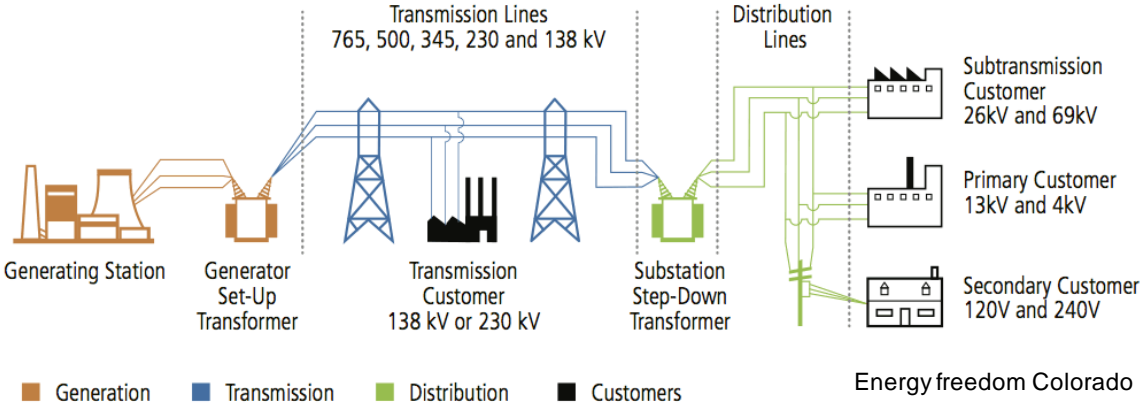
AAE-E3071

Electrical Energy Storage Systems

Course Practicalities

2023

Electrical Energy Storage Systems (winter 2023)



**Electricity grid
ELEC**

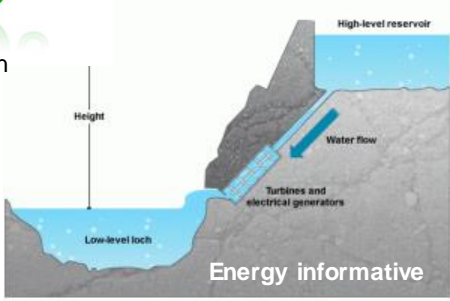


New energy updates



European commission

**Storages
ENG**



Energy informative

Indented learning outcomes (ILO)

1. Describe operating principles of key energy storage technologies, including their benefits and fundamental limitations.

2. Select relevant technologies for energy storage, including storage and conversion components.

3. Evaluate the features and the costs of electrical energy storage systems, based on industrial and student solutions.



Teaching
Staff



Floran Martin
Aalto - ELEC

Annukka Santasalo-Aarnio
Aalto - ENG

Teaching methods

Active self-study

(Read / Reflect / Report)

Project support videos

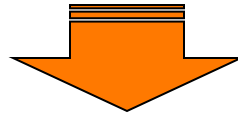
(Watch / Reflect / Quizzes)

Industrial experiences

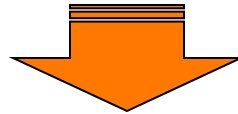
(Videos / Reflect)

Sequence of modules

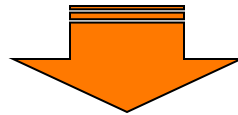
Module A – Introduction to electricity and storage



Module B – Connecting storage to electric network

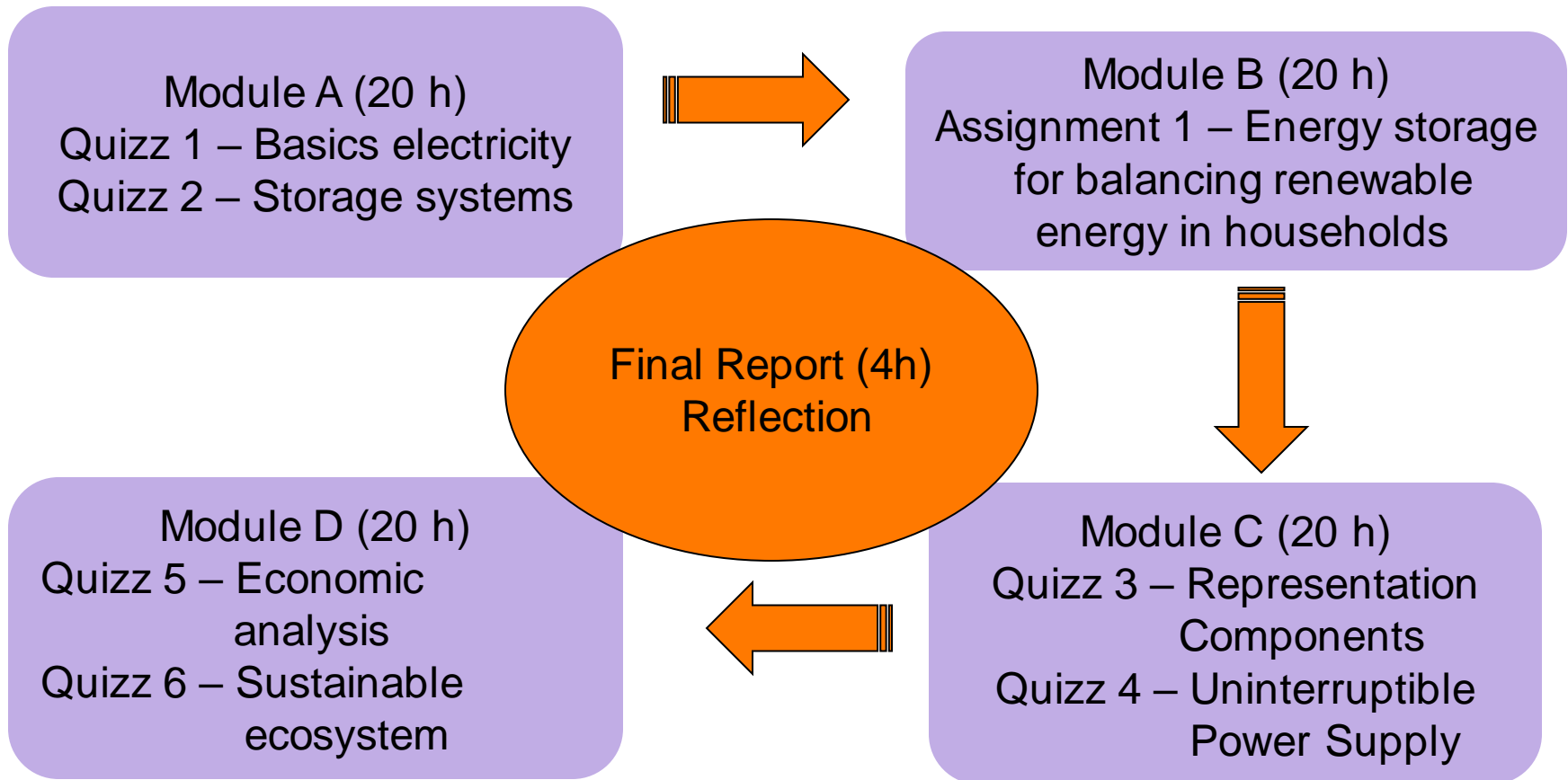


Module C – Representation of conversion system



Module D – Economic and sustainability analysis

Your activities



Assessment

Module A	10 p.
Module B	10 p.
Module C	10 p.
Module D	10 p.
Final reflection essay	15 p.
Course feedback	5 p.
<hr/>	
	60 p.

Grading Table

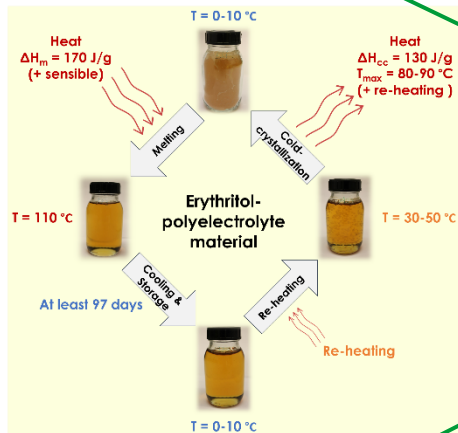
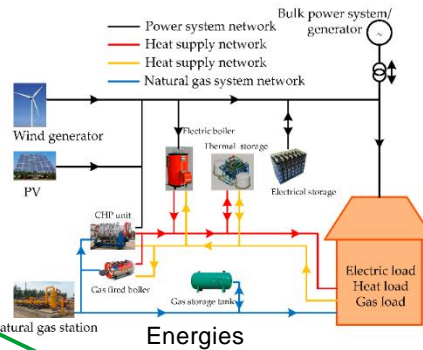
36-40 p.	- Grade 1
41-45 p.	- Grade 2
46-50 p.	- Grade 3
51-55 p.	- Grade 4
56-60 p.	- Grade 5

Courses of Energy Conversion or Storage (Aalto)

- **CHEM-E4255 Electrochemical Energy Conversion**
Introduces in more detail of electrochemical energy storage systems
- **ELEC-E8412 Power Electronics**
Introduces electric power conversion devices that are commonly needed in energy storage systems.
- **ELEC-E8405 - Electric Drives**
Covers fundamentals of the electric-to-electric and electric-to-mechanical power conversions
- **AAE-E3100 Energy Carriers**
How energy carriers are used in traffic (power to fuels/hydrogen) and EVs

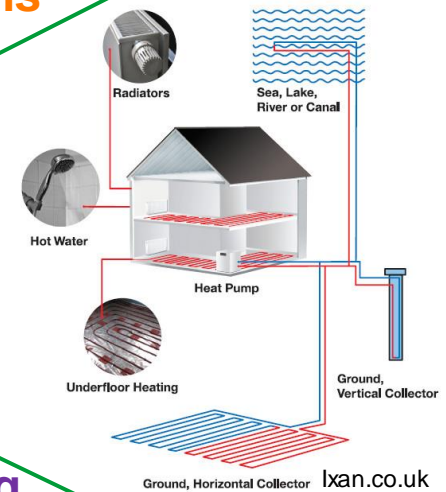
AAE-E3081 Thermal Energy Storage Systems (period IV-V)

Thermal Energy Storage Systems

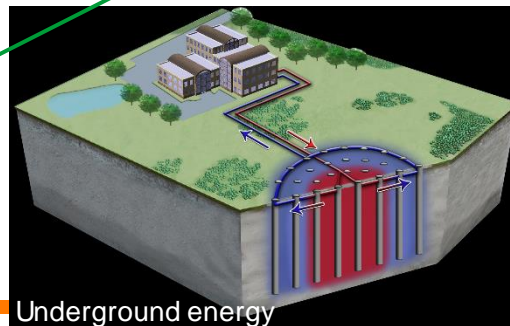


New Heat Storage materials

Heat pumps



Using soil/buildings as Energy Storage



Questions?

If you have question before, you can contact
the course responsible teacher, Florian
(floran.martin@aalto.fi)