Foto: Försvarsmakten/David Gernes

Energy Technologies for the Future Defence

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FOI
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Conducts research for a safer and more secure world

CBRN

Defence Economics

Cyber

Civil defence and Crisis preparedness

C3 Technology and Human Factors

Operational Analysis and Strategic Planning

Sensors and Signatures

Security policy

Electronic warfare

Underwater Technology

Warheads, munitions and protection

Space systems

Air, land and maritime systems

Autonomy and guided weapons

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Driving forces for a military energy transition

- Political & Legal
  - Contribute to national environmental goals, when possible given the overarching assignment
- Economical
  - Some transitions are economical in shorter or longer perspective.
- Social & organisational
  - Defence is part of the society, how it is perceived matters.
- Technology
  - Providing new capabilities and opportunities (silent watch, independence)
- Logistical
  - Security of energy supply, lightening the logistic burden of energy.
- Environmental
  - The transition of society setting preconditions for military solutions. The armed forces is a relatively small buyer of civil technology.

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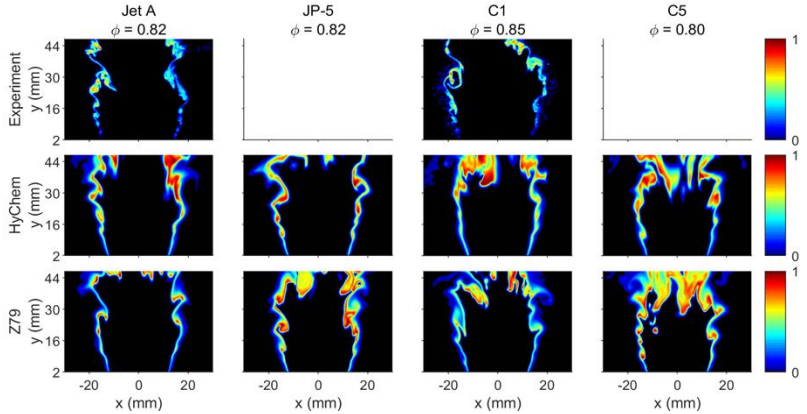
The Air Force is causing a majority of CO_2 emissions from the Armed Forces, mainly from the JAS 39-system. Hence the fuels and platforms used by the Air Force will, to a large extent, determine the possibilities of reducing CO_2 emissions.

(Försvarsmakten 2023, Klimatneutral Försvarsmakt)

Alternative fuels, experiments

Single burner based on TRI-60-motor

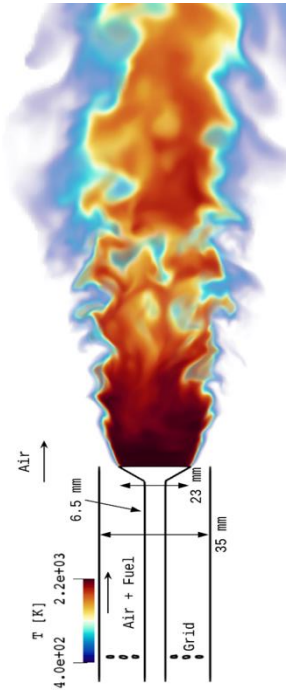


Tests, bio:

- ❑ CESTAP SAF
- ❑ HVO
- ❑ Etanol/butanol
- ❑ H_2/NH_3

Tests, konventional:

- ❑ Jet A
- ❑ JP-5
- ❑ Diesel



CESTAP - Competence cEntre in Sustainable Turbine fuels for Aviation and Power
https://cestap.se/

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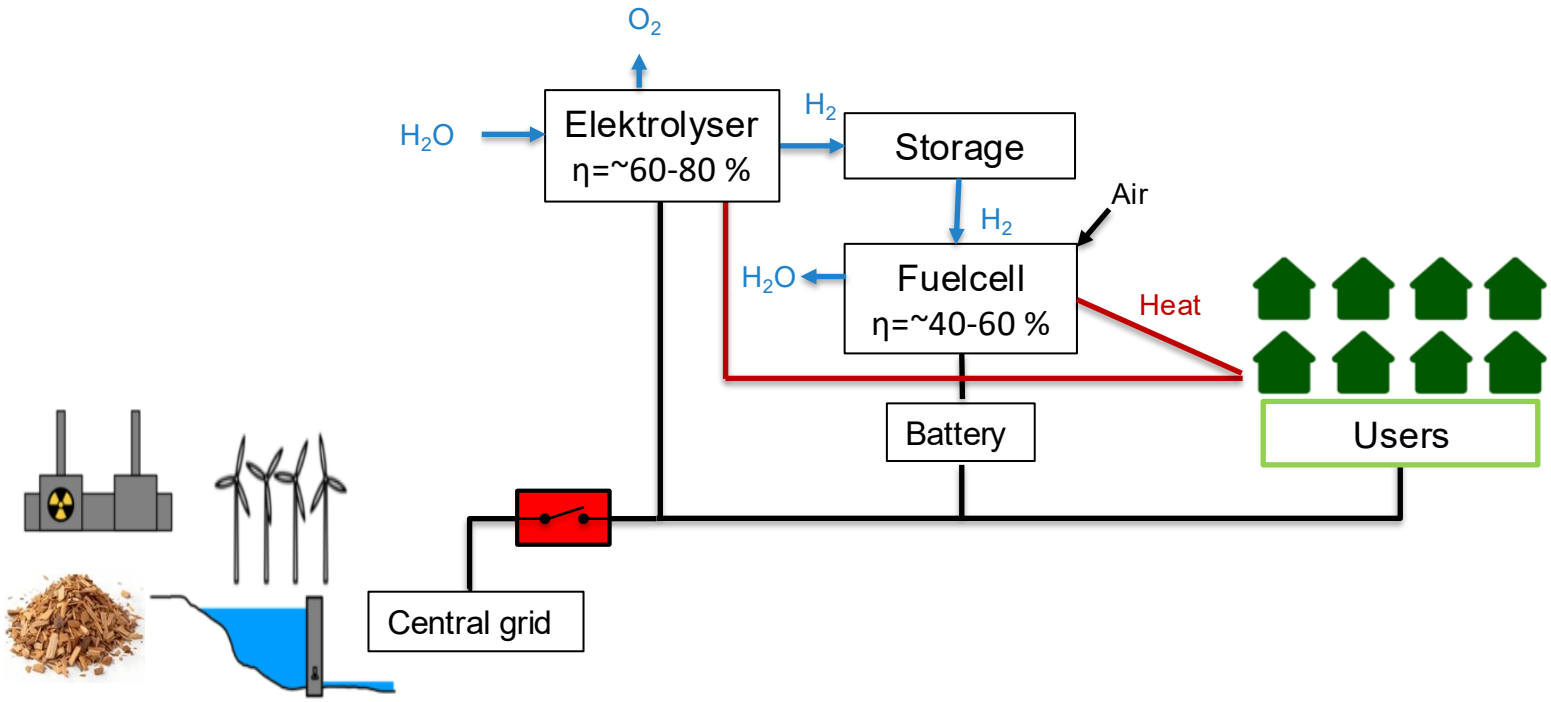
Hydrogen storage for resilient back up power



Challenges for a military energy transition

- Long lifespan of systems
- New technologies create new dependencies
- No compromising with performance
- Simplicity

- Coordination within NATO
- One of many urgent challenges.
- Energy transition and energy technology is widespread fields of research, demanding a joint effort!

What we do now…

- Continue working with the NATO STO (Science and Technology Organisation) to share experiences and increase knowledge of SAF in military aviation.
- Continue working within NATO Standardization groups.
- Continuing our engagement within CESTAP supporting the build up of new supply chains for SAF based on local feedstocks.
- Continuing research on energy technology, systems and supply chains striving for robust, resilient and independent supply, that suits the conditions of the Armed Forces.

Thank You!

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