Zero-emissions energy generation

Background

Present transport engines (eg petrol/diesel/jet) release much waste energy

Waste energy is used to heat the vehicles (cold climates), power air-conditioning (hot regions) or for auxiliary systems (eg equipment environment)

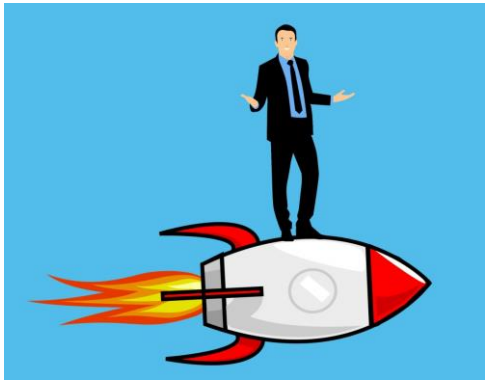
Electric vehicles much more efficient – little waste heat

Inefficient to use batteries for heating

- Battery capacity needed to maximise range
- Electricity production from thermal energy ~ 30% efficient

Compact, portable, zero-emission energy source needed

Zero-emissions energy generation: Challenge and scope



Proposals should:

- Address new technologies (high risk) for energy generation with potential for significant take-up

- Bring together a European interdisciplinary pool of expertise to reach its goal, and encourage outside interest to increase the community working on the area

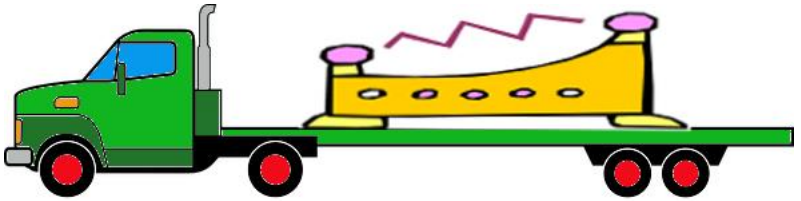
- Lay the foundations for a European innovation ecosystem (not only researchers) that can pursue the development after the project

Zero-emissions energy generation Scope

Any safe form of thermal or electrical energy generation
Proposed technology should produce no CO2

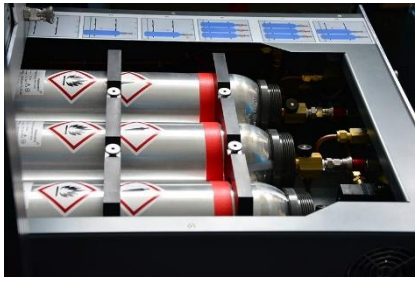
Equipment should be compact and portable:

- Transportable by lorry, boat, aircraft, people, ….
- Not built in to a fixed location
- Higher energy density than batteries



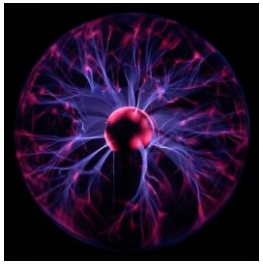
Identified application area
Minimal or no rare/toxic materials
Competitive (low cost)
Clear/ambitious performance targets and milestones needed
~~Work on batteries, solar cells, fuel cells excluded~~

Zero-emissions energy generation Scope – possible examples



Hydrogen storage eg metal hydrides

- Large and safe increase in storage density possible?



Plasma systems

- Plasmas are the most energetic state of matter
- Can they be confined in a portable device?

Cavitation systems

- Cavitation assisted energy harvesting systems:
- Can they provide enough energy in a portable form?

Novel batteries, fuel cells, solar cells…

NB These are not preferred approaches, just possible examples