Future prospects for stationary FC

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OEMs are emphasising manufacturing cost reductions

- Stationary FCs are high up-front cost
- Manufacturing automation and process improvement critical
- Increasing volumes will be key – is the stationary sector big enough and can it learn from automotive?

Source: https://www.osti.gov/servlets/purl/1332541
Role of FCs in decarbonisation will be a critical factor

- Natural gas fuel limits carbon saving potential – no better than grid?
- Biomethane would provide a simple transition path to lower carbon
- Major stationary FC manufacturers are all looking to develop hydrogen products
- AND remember AQ benefits!

Source: Doosan
High utilisation electrolysers key to cheap green H2

- Curtailed wind & PV (0€/kWh?)
- Europe PV & wind combined (0.06€/kWh)
- Best regions globally PV & wind combined (0.03€/kWh)
- Germany grid (0.15€/kWh)

Impact of technology development:
- KPIs 2017 (IndWEDe)
- KPIs 2030 (IndWEDe S3)
- KPIs 2050 (IndWEDe S3)

Cost contributors:
- Other levies
- Electricity tax
- Renewables-levy (EEG)
- Grid fees
- Electricity sourcing
- Electrolyser CAPEX & OPEX

Best regions globally PV & wind combined (0.03€/kWh)

Source: IRENA and E4tech
UK H2 for heat initiatives could encourage FC usage
FCs best seen in the context of the hydrogen economy
Conclusions

- FC costs falling
- FC = H2 + FC = low CO2
- Low NOx a plus
- FC CHP higher eff.

Need: low CO2 fuel
Lower cost needs sales
CHP ops. tricky

Lower cost needs sales
Thank you!

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