

# Advantages of E1 Technology

- E1 hydrogen generation system provides a safe and efficient solution for delivering hydrogen to PEM fuel cells as alternative to internal combustion engines:
  - ✓ Consumes approx. 35% less energy than diesel-generators, and thus more cost-effective option, even before considering new regulations or carbon tax<sup>(1)</sup>
  - ✓ With standard methanol, hydrogen generator / fuel cell set produces zero particulates, **zero NOX, zero SOX emissions, and approx. 30-50% less CO2** than a diesel generator <sup>(1)</sup>
  - ✓ Ready to meet anticipated future regulatory requirements by switching to renewable methanol; system can be potentially configured for efficient carbon capture and thus carbon negative, and can be modified to run on ammonia if desired
  - ✓ Simple design and construction with high reliability and very few “moving parts” thus low maintenance and repair costs as compared to internal combustion engines
  - ✓ Potential further operational efficiency gains vs. diesel engines when matched with a battery bank to provide surge power and manage low loads
- Onboard hydrogen generation is a much more cost-effective solution than off-site production, transportation, and onboard storage:
  - ✓ Cost of producing, transporting and then storing compressed hydrogen makes it very expensive on a delivered basis
  - ✓ Compressed H2 at high pressure (350 bar) requires about 400% more space to store the same amount of energy as the methanol water mix used by E1’s system <sup>(1)(2)</sup>
- Methanol is a highly efficient source of hydrogen; high hydrogen content, easy to handle and store and readily available in all markets

E1: L-Series Hydrogen Generator



1. Estimate based on Ardmore and E1 internal analysis of a 500kw system compared to diesel generator  
2. Source: Webber Research & Advisory March 2021  
3. Hydrogen at 700 bar ~40kg/m3 requires 253% more space / Liquid Hydrogen at -253 degrees Celsius requires ~34% more space

