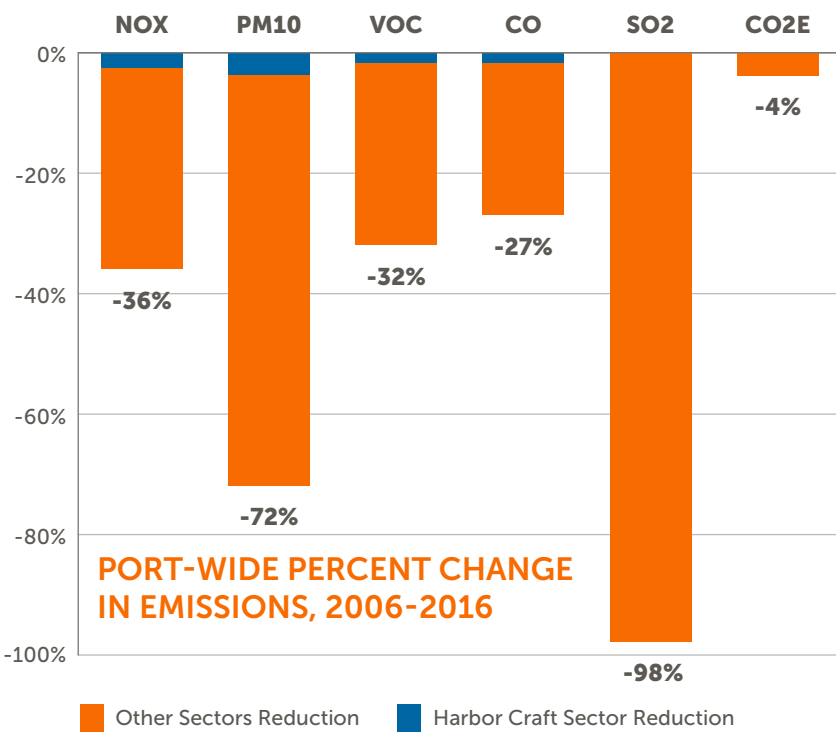


PORT OF NEW YORK & NEW JERSEY Progress to Cleaner Air

HARBOR CRAFT

PRIVATE TOUR VESSELS • PUBLIC AND PRIVATE FERRIES • COMMERCIAL VESSELS • TUGBOATS • PLEASURE CRAFT

PROGRESS



Engine Replacements

- New Jersey Clean Cities Coalition received grant funding for 16 Tier 2 engine repowers on six private harbor craft and an additional 11 Tier 3 engine repowers on five private harbor craft

Ferry Retrofits and Repowers, Led by NYC DOT

- Installed diesel oxidation catalysts on over 31 private ferries
- Upgraded 9 ferry vessels from Tier 2 to Tier 3 engines
- Repowered 1 ferry with a Tier 2 engine
- All ferries used ultra-low sulfur diesel fuel ahead of EPA's 2012 Offroad Engine Standard

Emissions for the Harbor Craft sector are only measured for harbor craft involved in Port maritime operations, which include tugs, towboats, and pushboats. However, the Strategy includes actions for other harbor craft not under the aegis of the Port where these actions could be implemented by partner organizations.

OPPORTUNITIES

Retrofit with after-treatment technologies (e.g., diesel oxidation catalysts or diesel particulate filters)

Replace or repower older equipment with...

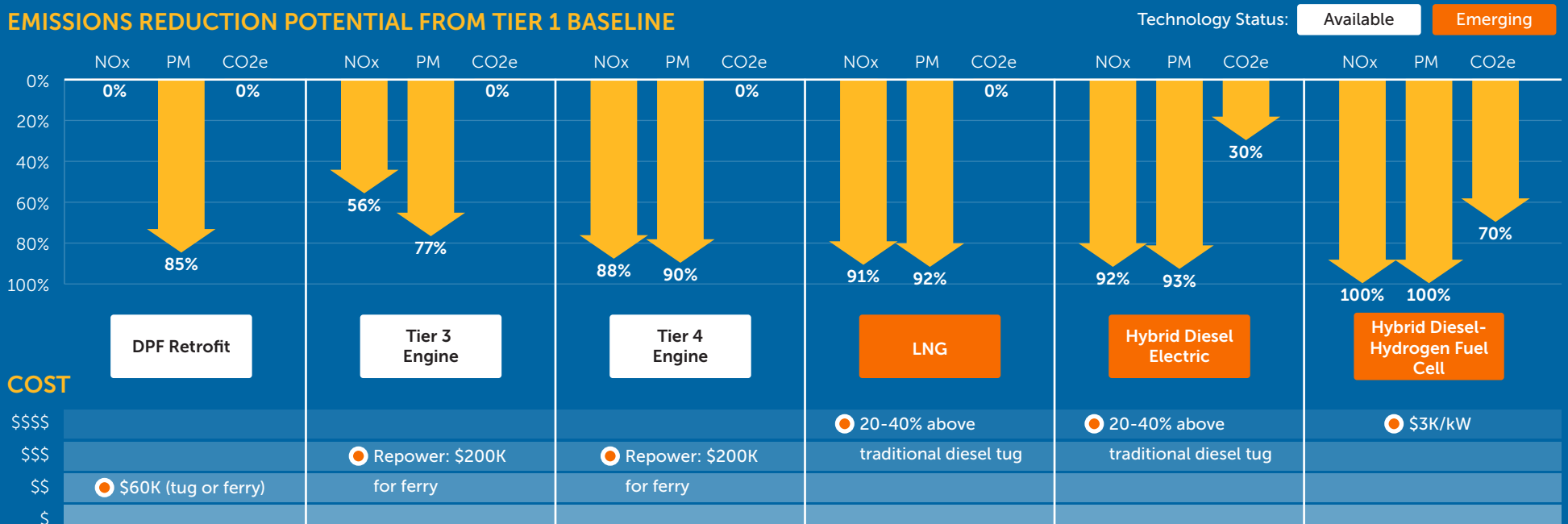
- Newer, lower emission diesel engines (Tier 3 or Tier 4)
- Alternative fuels such as liquefied natural gas (LNG)
- Hybrid engines
- Fuel cell or battery electric propulsion systems

ALTERNATIVELY-POWERED HARBOR CRAFT

While hybrid vessel technology is still emerging, there are a few examples of hybrid and alternatively-powered harbor craft in service in Europe and the U.S.

- In New York Harbor, an excursion vessel is powered by Tier 2 diesel gensets combined with power from solar cells, wind turbines, and hydrogen fuel cells
- Norway is leading the development of battery electric ferries for trips under 30 minutes

EMISSIONS REDUCTION POTENTIAL FROM TIER 1 BASELINE



SOURCES

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