REGULATORY AUTHORITY

Bermuda

Summary of the Integrated Resource Plan Alternative Proposals

1 SUMMARY OF ALTERNATIVE PROPOSALS

1. This report provides a high-level overview of each Alternative Proposal. For further detail into the evaluation of the Alternative Proposals please refer to the Ricardo issued report "Overview of Integrated Resource Plan Alternative Proposals" published on the Authority website.

1.1 BCM MCALPINE AND BOUYGUES ENERGIES & SERVICES

2. The Alternative Proposal from BCM McAlpine and Bouygues Energies & Services appears to be an expression of interest to conduct a feasibility study into different generation technologies that could be deployed at the Ship's Wharf site. Three possible fuel options are suggested for distributed generation:

- Liquefied oil products: Heavy fuel oil (HFO) or light fuel oil (LFO) – with reciprocating engines;
- Liquefied gas: Liquefied natural gas (LNG) or liquefied petroleum gas (LPG) – with reciprocating engines; and
- Biomass – with boiler and steam turbine plant.

1.2 BERMUDA ENGINEERING COMPANY LIMITED (BE SOLAR)

3. The Alternative Proposal from Bermuda Engineering Company Limited (BE Solar) effectively provides another version of an IRP for Bermuda. It assesses several scenarios, some of which include a significant energy efficiency component and high renewables deployment. The preferred option features a 60 MW offshore wind farm, which is proposed to be operational by 2023.

1.3 BERMUDA ENVIRONMENT ENERGY SOLUTIONS GROUP CONSORTIUM

4. The Alternative Proposal from Bermuda Environment Energy Solutions Group Consortium (BEESG) provides details of a proposed bulk generation plant at Ship's Wharf comprised of 6 dual fuel reciprocating internal combustion engines, giving a total generating capacity of about 55 MW.

1.4 BERMUDA GENERAL AGENCY LTD.

5. The alternative proposal from Bermuda General Agency Ltd. (BGA) is for a wave energy park for bulk generation capacity up to 20 MW.

1.5 BRAD SORENSEN AND ARPHEION INC.

6. The Alternative Proposal from Brad Sorensen and Arpheion Inc. is for "at least 200 MW of clean energy" from hydrogen-based steam generation and water production from recovered steam. A new underground electricity network and a new water supply system are also proposed for the electricity and water production.

1.6 ENVIVA AND ALBIOMA

7. The Alternative Proposal from Enviva and Albioma provides details of a proposed steam fired generation plant at Ship's Wharf based on biomass technology with a total generation capacity of 47 MW. It is understood that this generation plant would be generating electricity from wood pellets, manufactured remotely and imported to Bermuda.

1.7 OFFSHORE UTILITIES

8. The Alternative Proposal from Offshore Utilities provides details of a ship-based floating power plant anchored offshore. The power plant will be comprised of two LNG fuelled combined cycle gas turbines with generation capacity of at least 100 MW.

1.8 SOL

9. The Alternative Proposal from Sol is for a bulk generation plant based on HFO/LNG dual-fuel reciprocating internal combustion engines located at Sol's Ferry Reach Terminal. Two options are considered: 18.4 MW and 55.2 MW. The lower capacity option is the maximum size that could be exported without grid reinforcement and the latter is the maximum potential of the site if changes were made to the grid to export the power.

	Generation Capacity	**Generation Technology**	**Fuel**	**Proposed Location**
BCM McAlpine and Bouygues Energies & Services	At least 20MW	Reciprocating Engines	Heavy Fuel Oil (HFO) Light Fuel Oil (LFO)	Ship's Wharf
		Reciprocating Engines	Liquefied Natural Gas (LNG) Liquefied Petroleum Gas (LPG)	
		Steam Turbine	Biomass	
Bermuda Engineering Company Limited (BE Solar)	60MW	Wind Turbines	Wind	Moorings Anchorage

Bermuda Environment Energy Solutions Group Consortium (BEESG)	55MW	Dual-fuel reciprocating internal combustion engines	LNG	Ship's Wharf
Bermuda General Agency (BGA) Ltd.	20MW	Wave Energy	Ocean	Unspecified
Brad Sorensen And Arpheion Inc.	At least 200MW	Steam Turbine	Hydrogen	Unspecified
Enviva and Albioma	47MW	Steam Turbine	Biomass	Ship's Wharf
Offshore Utilities	At least 100MW	Combined Cycle Gas Turbines	LNG	North Shore
SOL	Up to 55.2MW	Dual-fuel reciprocating internal combustion engines	LNG HFO	SOL Ferry Reach Terminal