



Why a ZEB is not diesel

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MOVING PEOPLE

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Introduction

- Wounded canary (but not dead)
- ZEB rollout is constrained because:
 - Infrastructure requirements are a problem
 - Lead times are large
 - Costs can be enormous
 - Approvals are difficult to obtain

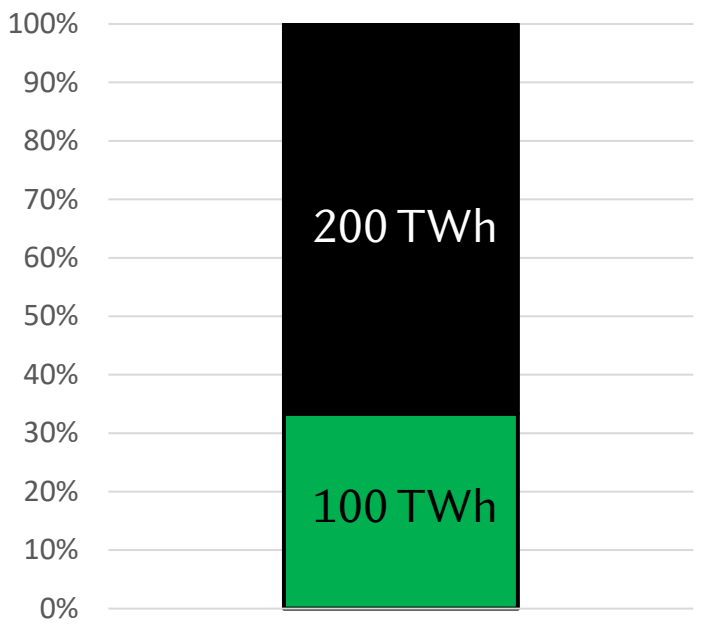
All these things point towards ZEB operation being a new paradigm that needs to be approached with care if the operator is to be successful

- BEB or FCEB?



What is the scale?

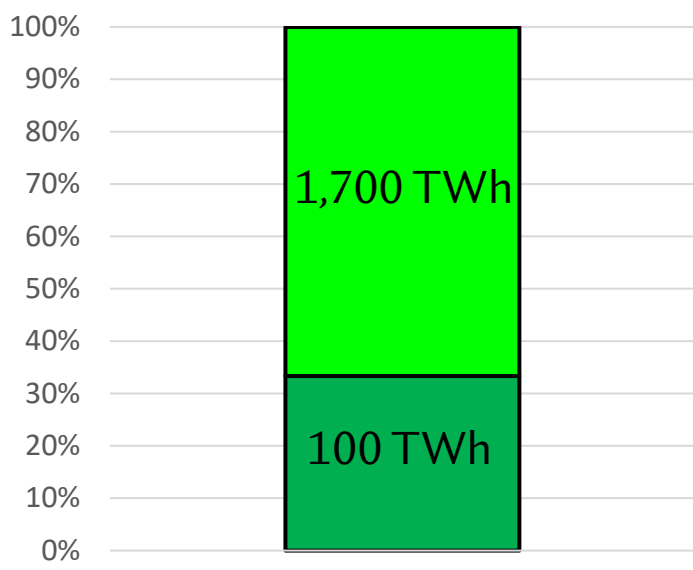
Current Total Electricity Generation



■ Renewable Energy ■ Non-renewable Energy

6 x
 current total generated energy required to decarbonise all sectors... and it needs to be **green**

Required Renewable Energy Generation to replace all fossil fuels in all sectors



■ Truck & Bus ■ Remaining sectors

The Green Power question

- Impact of power to overall operational cost
- Collaborative Industry power plan available to Operators?
- Green Power costs are volatile and require expert management
- What happens if power is not available?
- Any solution must be transparent
- Power infrastructure will be site specific and may be not available






Contractual elements

Diesel	ZEB (All diesel elements plus the following)
Fuel	Electrical Power including energy source (solar and microgrids)
Maintenance	Charging infrastructure (BEB)
Labour	HRS (FCEB)
Overheads	H2 storage, compression and cooling (FCEB)
Capital	Mid-life renewal (fuel cell, battery, electric motor, electrolyser)
Margin	Upskilling and training (including high voltage and gas)
	Social license including first responders
	Electrolyser TCO
	Water

The ZEB Transition

Current contract- Key role players New ZEB Environment



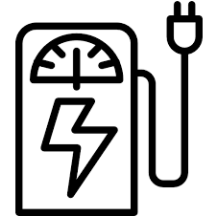
Renewable energy
source



State
Government



Bus
Operator



Infrastructure
Providers

Transition Enablers



National Energy
Policy



Training &
Workforce development



Social license



Contract
framework reset



Regulatory &
Approvals pathway



OEM technology
investment



Research



The Framework Reset





Thank you

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