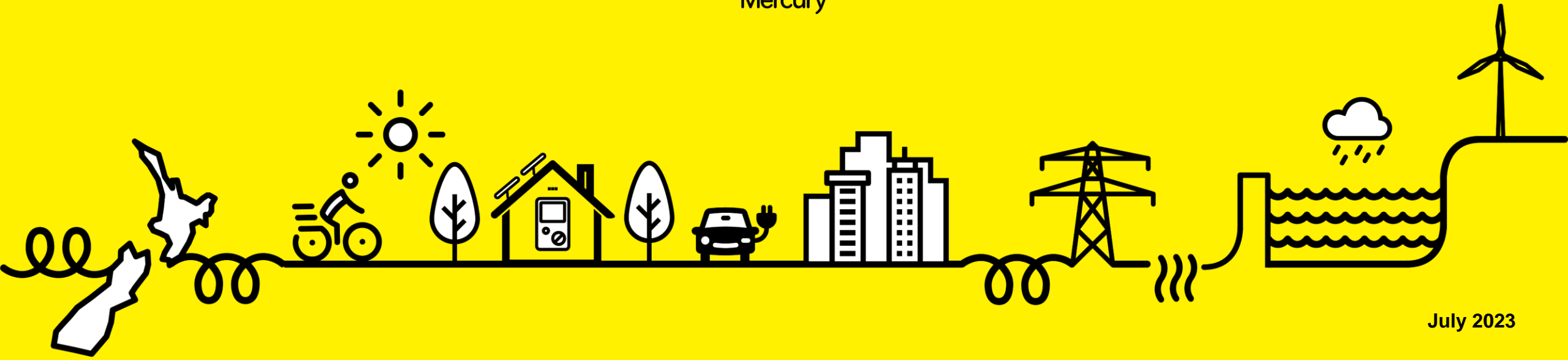


CO2 EMISSIONS REDUCTION UPDATE MCY

GENERATION



July 2023



HISTORY OF NCG TRIAL AT NGATAMARIKI

NTM Station

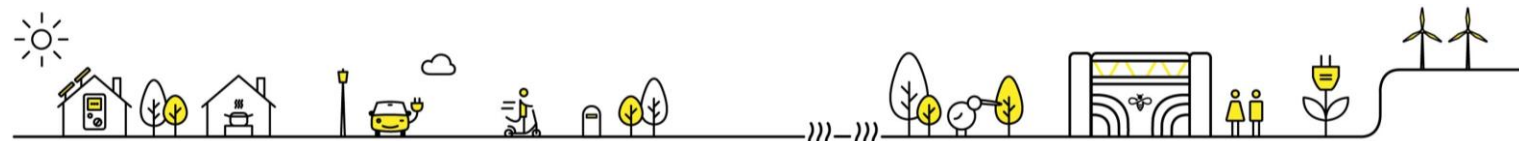
- 86 MW Binary Power Plant, 4 OEC units (+ OEC-5)
- 15% of NCGs already dissolved in condensate, the rest vented to the cooling tower

Trial Stats

- NCG reinjection system commissioned in October 2021
- ~25% of vented NCG from NTM Station is dissolved in injection fluid and reinjected back into the reservoir

Key Drivers

- Reduce carbon emission - ~8,083 ton/yr CO₂ emissions
- Understand NCGs solubility and reinjection limits
- Study long term effects on the reservoir and wells

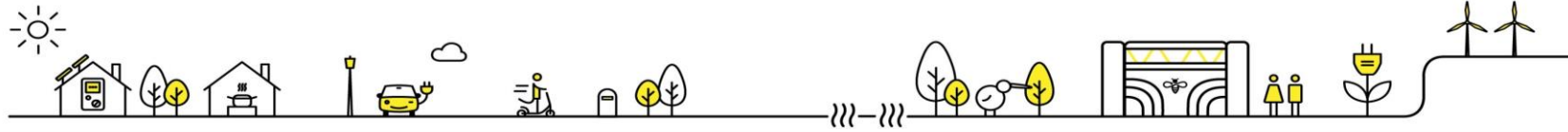


NCG REINJECTION SYSTEM





HIGH LEVEL RISKS



RISK	POTENTIAL NEGATIVE EFFECTS	RISK MITIGATION	LEARNINGS (After more than a year of operation)	
Health and Safety	<ul style="list-style-type: none"> Increase exposure risk to H₂S along the reinjection system 	H ₂ S modelling to quantify risks and plan mitigations	NTM Station Operation	No change in control stability during NCG injection
Control Instability	<ul style="list-style-type: none"> If the system is too unstable to control adequately, NCG compression or additional control equipment may be required - increased OPEX 	Trial plan developed to monitor and investigate these risks Process design review and monitoring of hydraulic performance of the system	NTM Station Operation	No change in control stability during NCG injection
Corrosion on Reinjection Pipeline	<ul style="list-style-type: none"> Addition of NCGs lower the reinjection fluid pH Corrosion inhibitor may be required 		Corrosion and scaling in pipeline and wellhead	<ul style="list-style-type: none"> Corrosion within corrosion design allowance Scaling in pipeline minimal, act as passive protection
Gas Caps in Wells	<ul style="list-style-type: none"> Insufficient mixing may cause gas bubbles to accumulate in reinjection system and restrict injection capacity 		Gas caps in injection well – can restrict flow capacity	No gas cap formed in injection well
Increased Scaling	<ul style="list-style-type: none"> Mineral scaling in pipelines and injection wells 		Permeability change due to silica scaling information – can reduce well capacity	Monitoring in progress, no major changing in injection well performance to date
Gas Returns to Production Wells	<ul style="list-style-type: none"> Gas content in production wells may rise over time affect station performance 		Gas return in production wells – may affect station performance	Stable or slightly decreasing gas concentrations in production fluids

WHAT NEXT...?

Expansion at NTM will take the following into consideration:

- Internally completing Gas lock mechanism, limitations & alternative injection design to overcome any technical limits
- GNS / UoA Modelling for gas injection effects on reservoir & migration through reservoir with investigation on station operation

Emissions Reduction Plan

- Defining the challenge with flash plants & explore existing technology to fast-track implementation
- Geothermal emissions reduction strategy fits into Mercurys broader Carbon Transition Action Plan

