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Setting Wellington Water on a pathway to net zero emissions

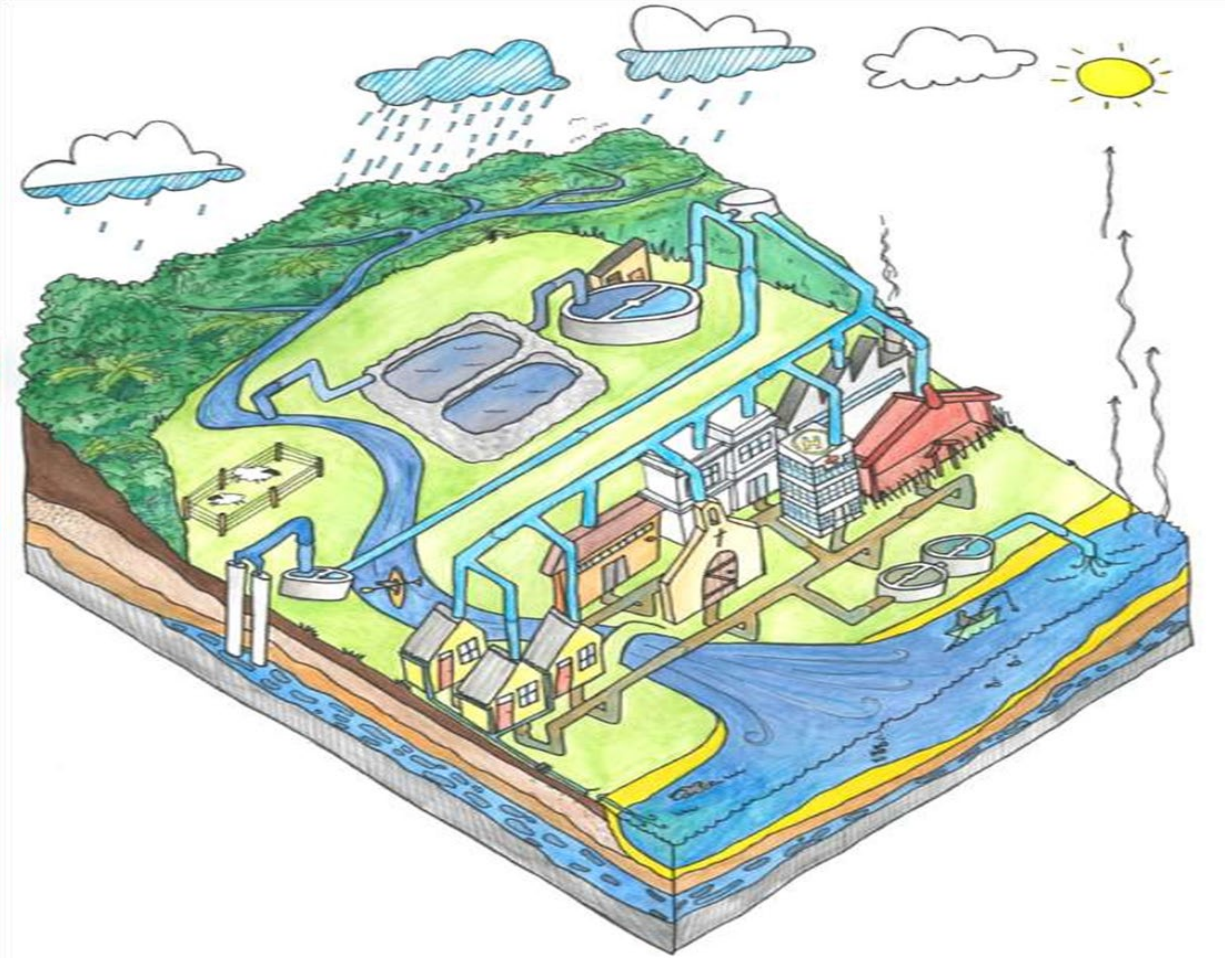
Mott MacDonald

Wellington Water

water NEW ZEALAND
The New Zealand Water & Wastes Association Waiora Aotearoa

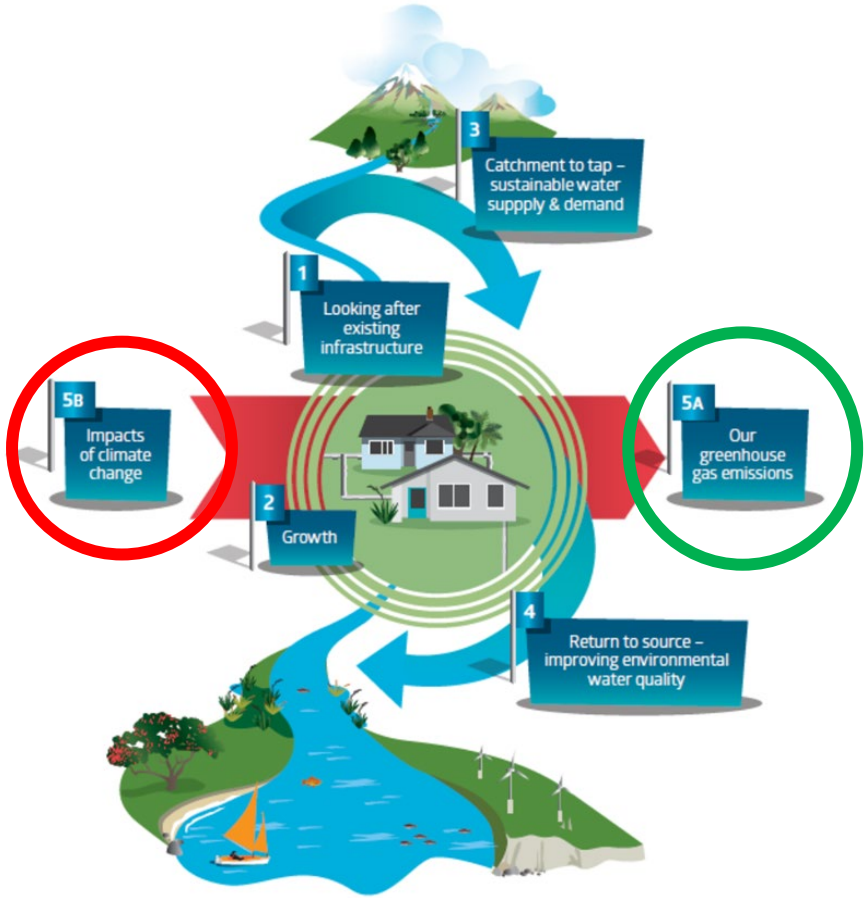
water NEW ZEALAND CONFERENCE & EXPO
17-19 OCTOBER 2023
Tākina, Te Whanganui-a-Tara Wellington

Wellington Water is a climate dependent business



Climate action is a strategic priority

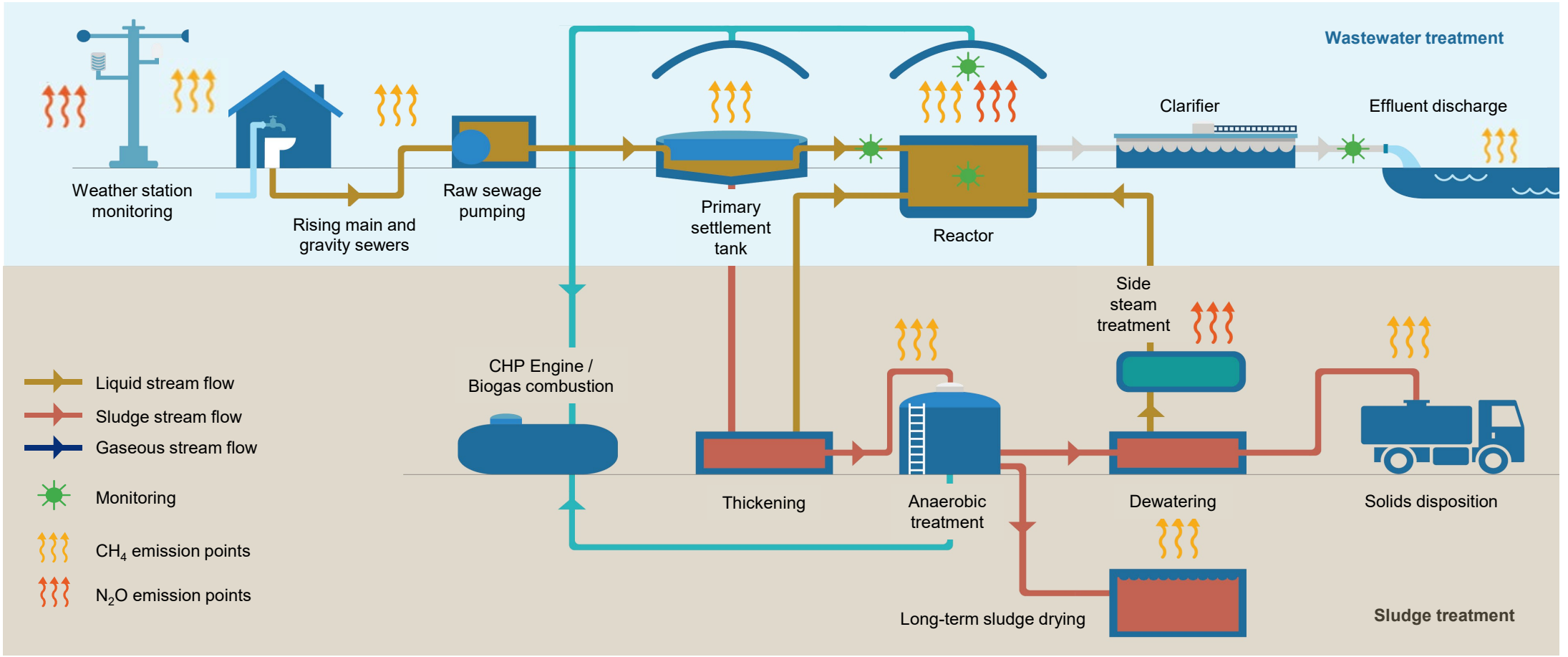
Adaptation



Mitigation

GHG emissions at Wellington Water

Treatment processes are a key source of operational emissions (including N_2O + CH_4)



Developing an emissions reduction pathway

1.

Baseline + Target

Where are you now? Current emissions profile.

Where do you want to get to? How ambitious do you want to be in setting a target?

2.

Decarbonisation Options and pathways

What are your options for reducing emissions?

How do these options aggregate into pathways?

3.

Actions + next steps

How will you achieve an ambitious pathway?

What are the key next steps for Wellington Water?

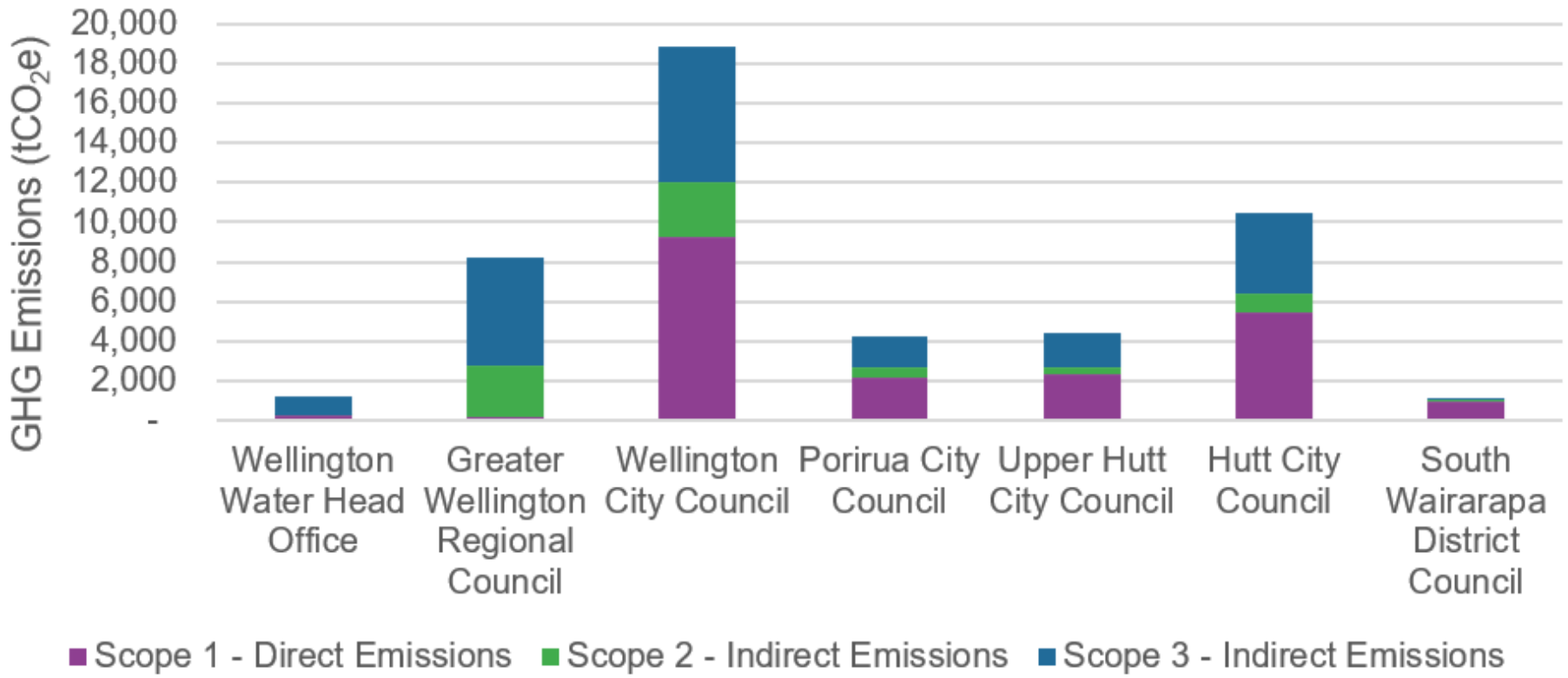
Where is Wellington Water now?

Operational emissions inventory for 2020-21

48,438 tCO_2e

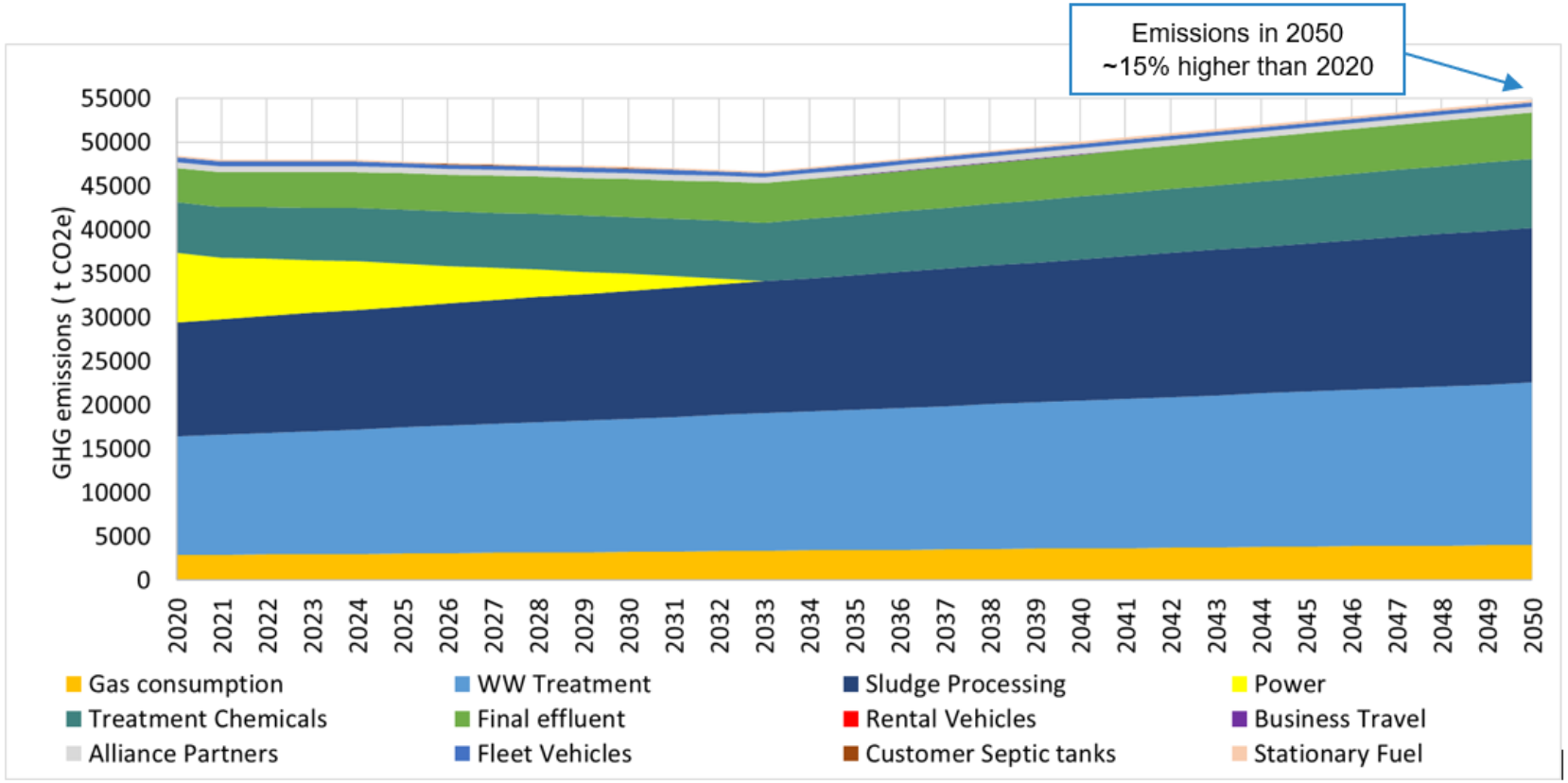
Hotspot	Emissions (tCO_2e)	% of total inventory
Biogenic CH_4 and N_2O, from wastewater treatment	13,552 tCO_2e	28%
Biogenic CH_4 and N_2O, from sludge disposal	12,779 tCO_2e	26%
Electricity use (with T&D losses included)	7,288 tCO_2e (7,957 tCO_2e)	15% (16.4%)
Purchased chemicals	5,768 tCO_2e	12%
Biogenic CH_4 and N_2O, from effluent discharge	3,910 tCO_2e	8%
Natural gas use (with T&D losses included)	2,691 tCO_2e (2,851 tCO_2e)	6% (6.3%)
Fleet vehicles including Fulton Hogan	930 tCO_2e	1.9%

Operational emissions by asset owner



Business-as-usual (BAU) pathway

Emissions grow with population. No action other than grid decarbonisation



Where does Wellington Water want to be?

There are options for targets and levels of ambition, but general principal should be to reduce emissions as much as possible

New Zealand Government

"Split gas approach"

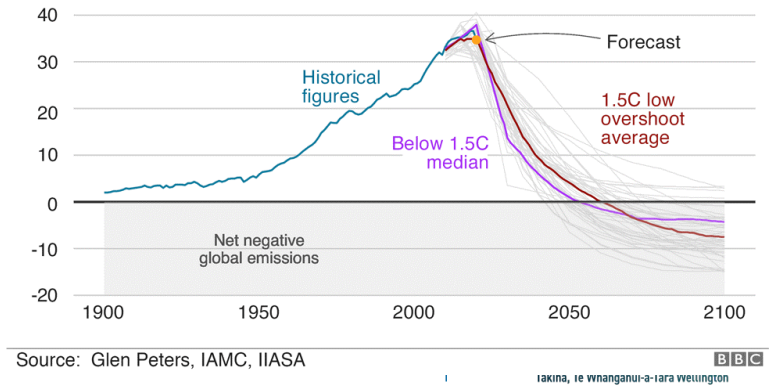
- **Reduce long-lived gases 34% by 2030 and to net zero by 2050**
- **Reduce biogenic methane 10% by 2030 and by 24-47% by 2050**

SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Treats all gases in the same way

- **50% reduction in all GHGs by 2030**
- **Net zero by 2050**



Decarbonisation options assessments

We analysed over 50 emissions reduction options. For each, we defined 2 levels of future deployment – "typical" and "best-case"

Reduce water demand and improve catchment management

- Widespread customer metering
- Changes to farming practices
- Improve leakage management

Reduce energy and chemical use through efficiencies

- Data + analytics
- Monitoring and smart control systems to drive optimisation

Replace fossil fuels

- Electrification of process heat
- Onsite renewables + green PPAs
- Use of biofuels for large fleet vehicles

Reduce emissions from WW treatment by optimisation

- Gather data e.g. N_2O probes
- Use digital to proactively manage
- Improve capture rates

Reduce emissions from WW processes via new technology

- Advanced digestion processes
- Post sludge treatment
- Conversion of biosolids to char or gasification

Examples – not comprehensive lists

Biggest impact opportunities

We identified 4 intervention areas with most emissions reduction potential

1

Reduce wastewater treatment and effluent discharge emissions

- Shift to proactive operational regime
- Digitally enabled optimisation
- Low emissions processes e.g. MABR

2

Reduce then eliminate sludge disposal methane emissions

- Sludge management prior to treatment
- Capture and use biogas
- New technologies to gasify solids

3

Eliminate use of fossil fuels for energy

- Proceed with Seaview WWTP upgrades to eliminate natural gas
- Switch to electric vehicles
- Onsite renewables + green PPAs

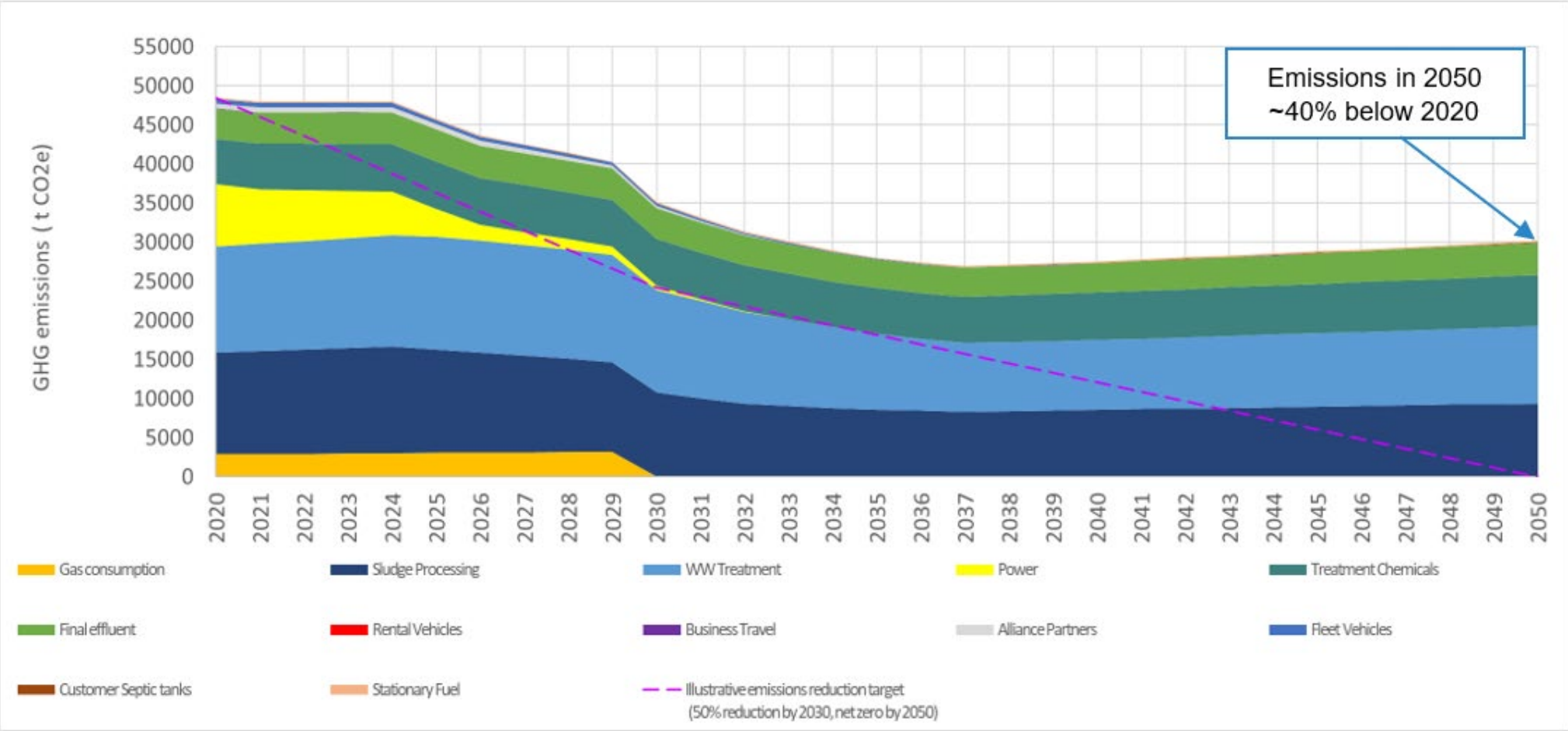
4

Reduce use and embodied emissions of treatment chemicals

- Operational efficiencies
- Changes to operating philosophies
- Reduce water demand
- Improve water catchment quality
- Work with supply chain

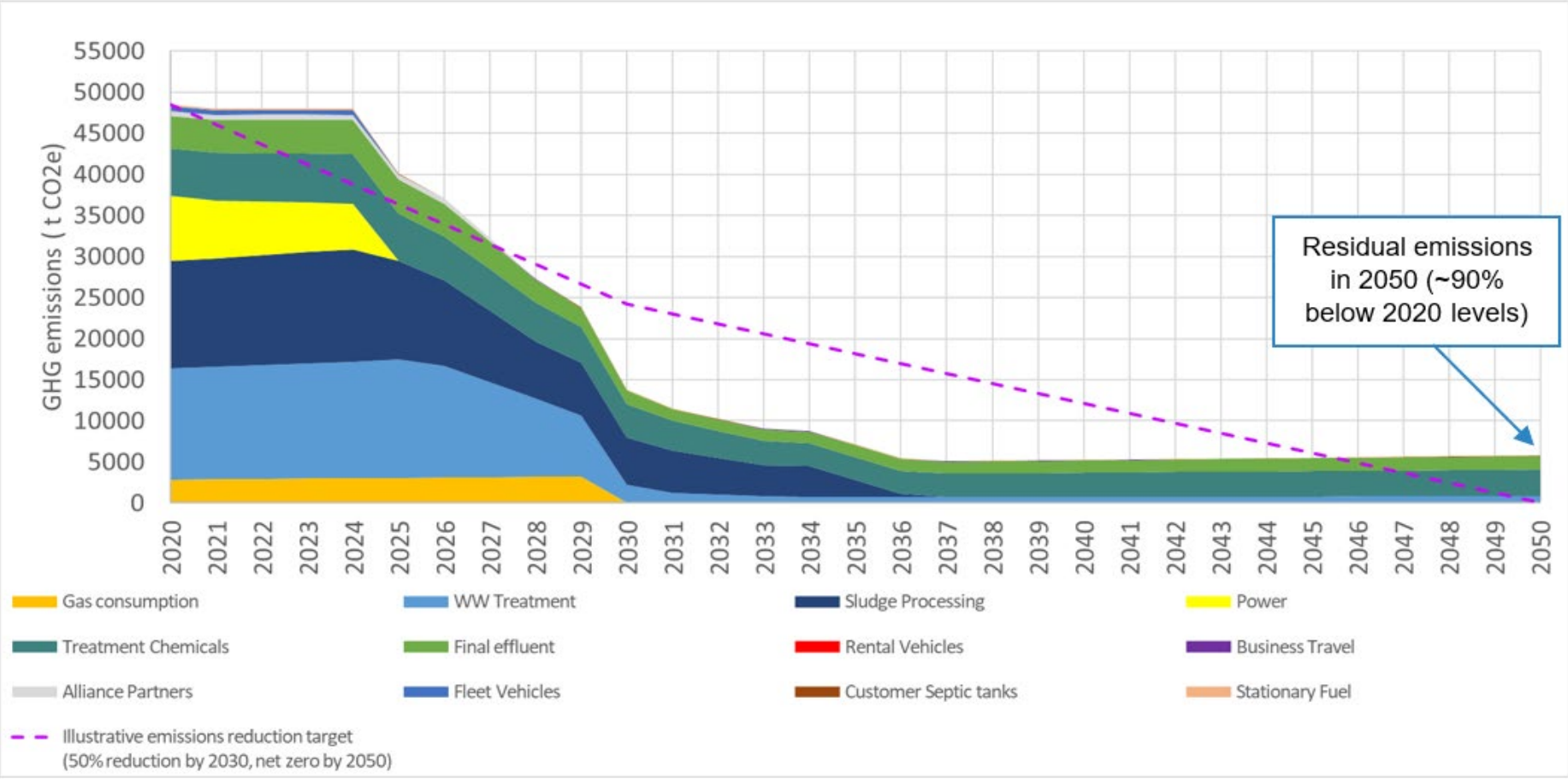
Moderate effort pathway

Assumes current delivery and procurement processes but greater focus on investment. Only technologically developed options are used



Step-change pathway

Ambitious near best-case scenario where financial and policy barriers are removed, investment is increased and technological changes are achieved



Next steps

Develop & implement fully fledged **net-zero strategy**, underpinned by leadership buy-in, engagement with Iwi and stakeholders, and a commitment to sustained investment

1. Implement low regrets measures now
2. Seek to embed climate as priority in Three Waters reforms
3. Embed carbon in governance and processes

Thank you

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