



Hydrogen and Water in the Hunter

- NewH2 Exchange Forum

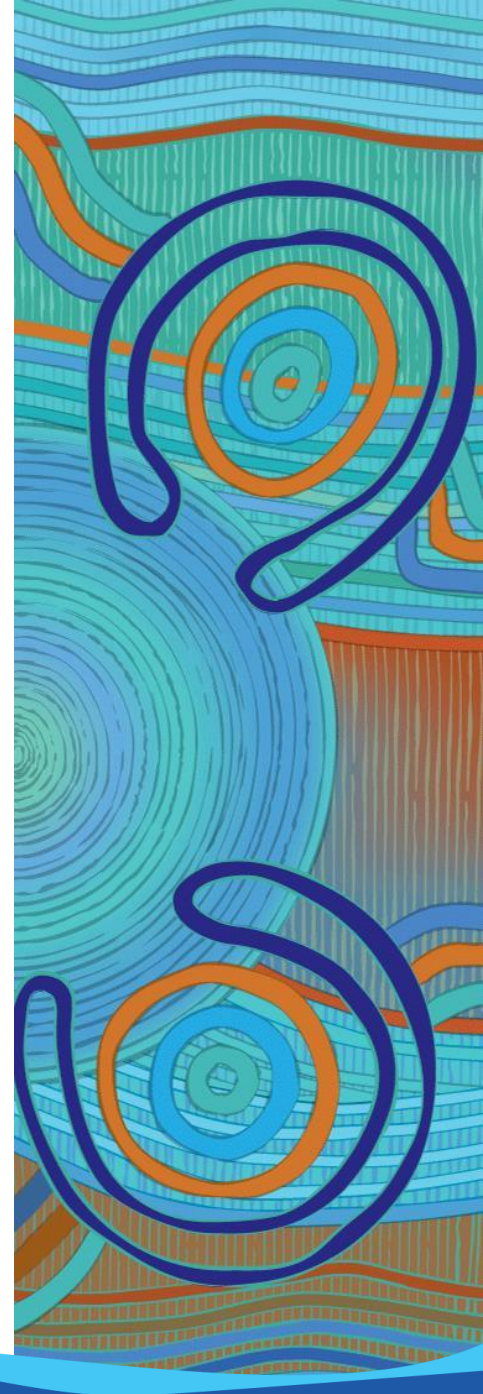
Tony McClymont – Manager Sustainable Growth



ACKNOWLEDGEMENT OF COUNTRY

Hunter Water acknowledges the Traditional Countries of the Awabakal, Geawegal, Darkinjung, Wonnarua and Worimi peoples on which we operate and the Countries beyond where our water flows.

We recognise and respect the cultural heritage, beliefs and continuing connection to the lands and waters of our Traditional Custodians and pay respect to their Elders past, present and emerging.





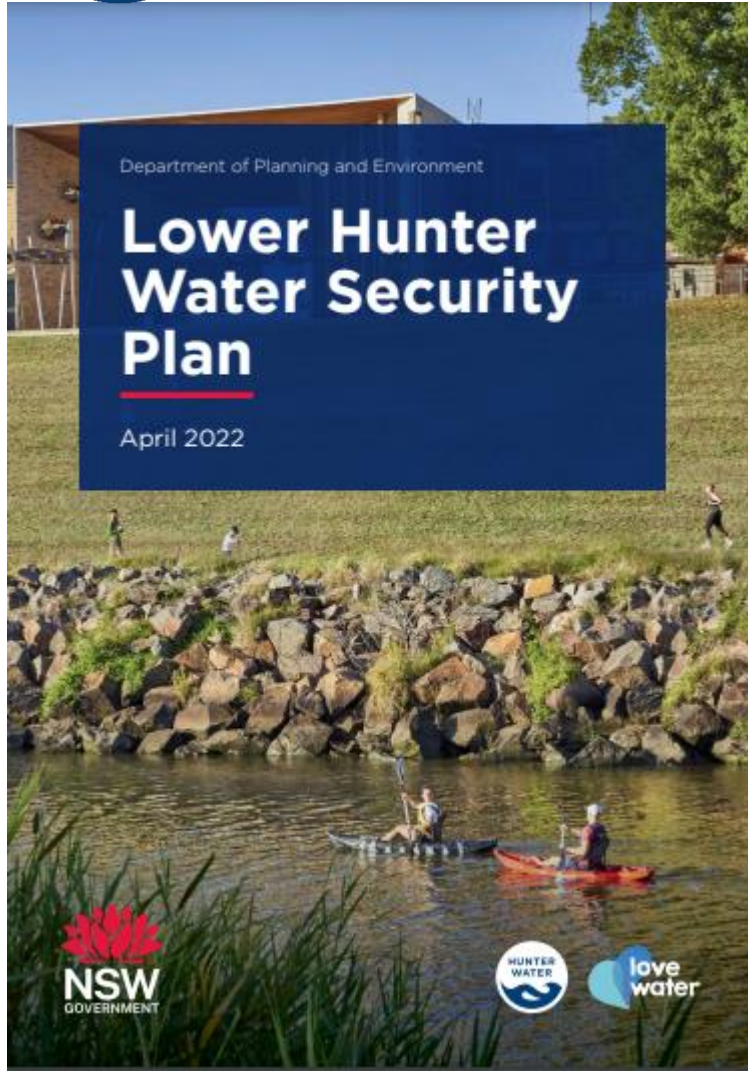
Hunter Water

- Provides drinking water, wastewater, recycled water, and some stormwater services to the Lower Hunter
- Average water supply 180 ML/d
- NSW Government released the *Lower Hunter Water Security Plan* in April 2022 to improve water security and support a growing region





Lower Hunter Water Security Plan



The Lower Hunter Water Security Plan is a whole-of-government approach to ensuring the region has a resilient and sustainable water future that contributes to regional health and prosperity, and is supported by the community.

To meet the challenges facing the regions water resources the plan recognises:

We need to plan differently

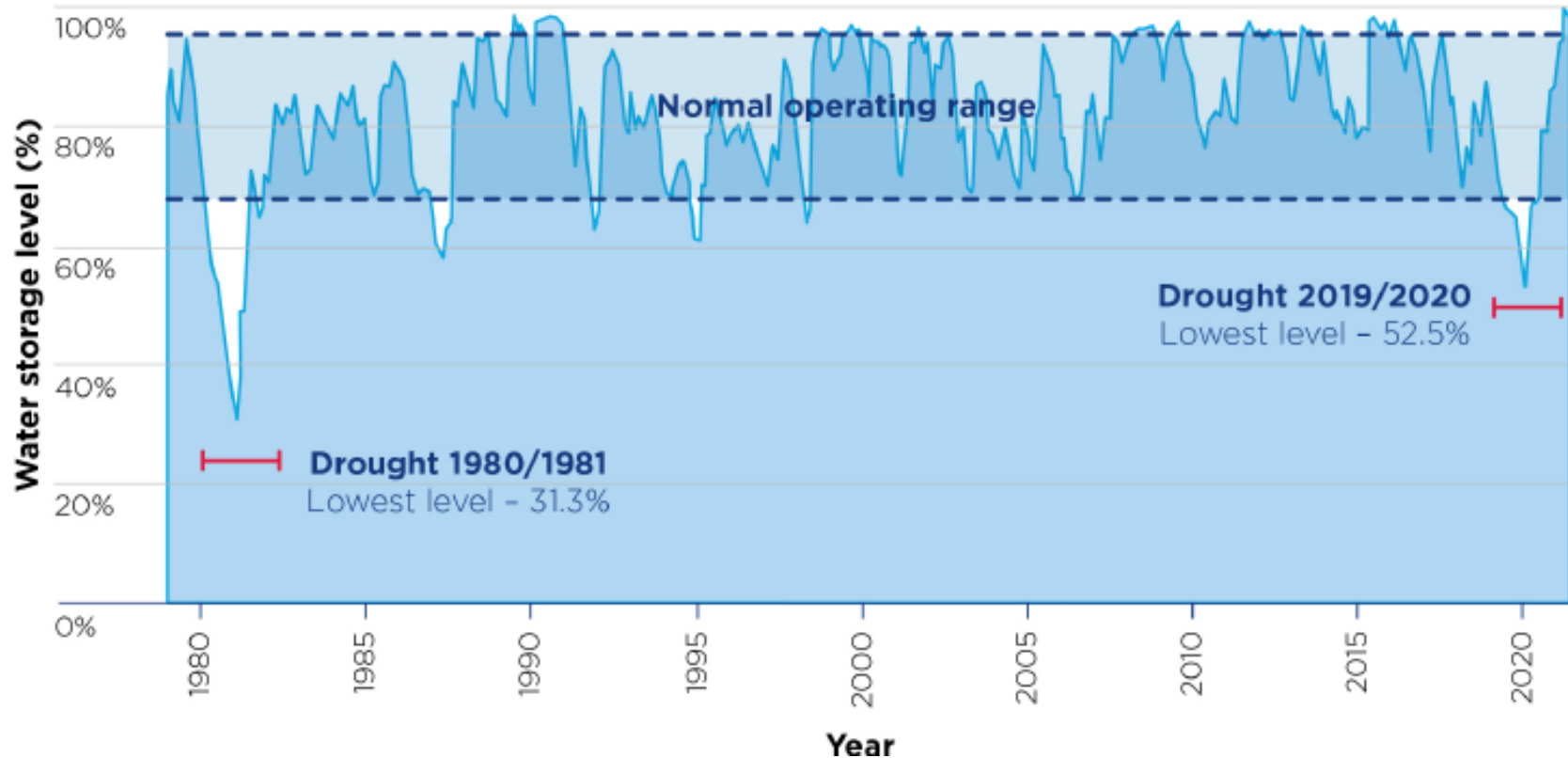
We need to act now

We need to remain adaptive

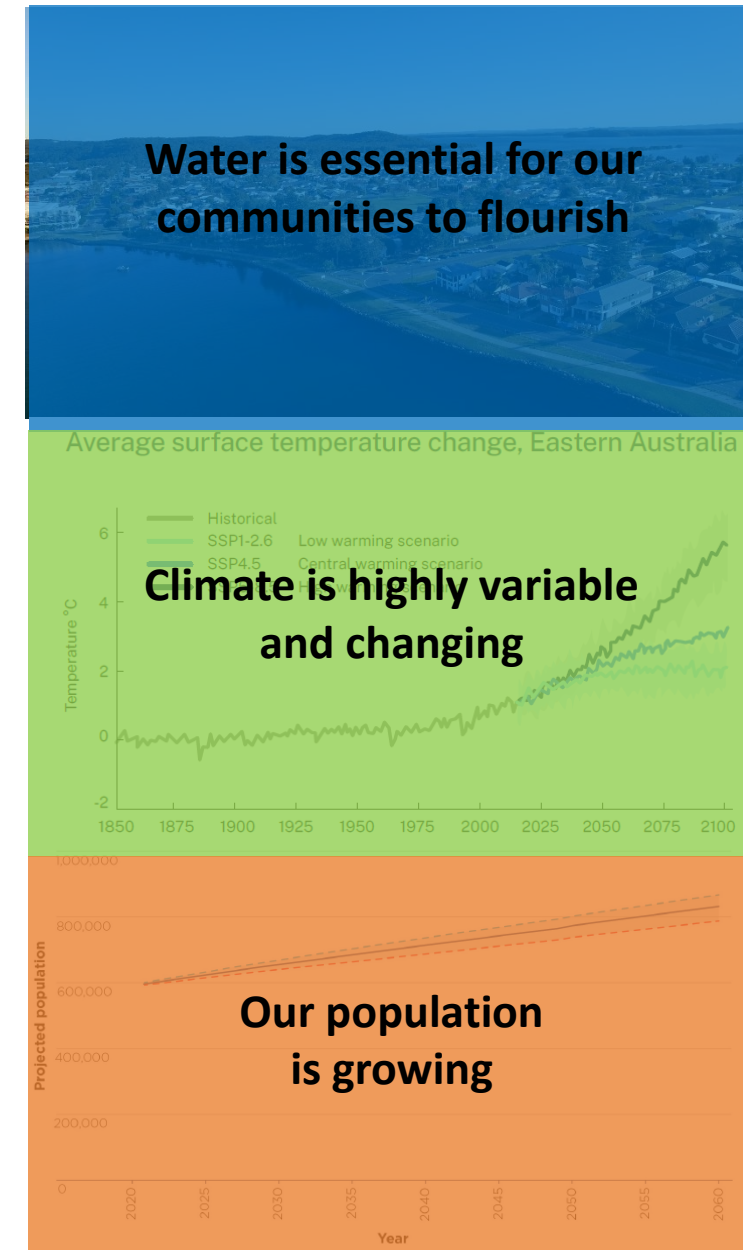
A secure water supply means there is enough water to meet community needs through typical conditions and during drought.



Water Supply Challenges



Lower Hunter combined water storage levels

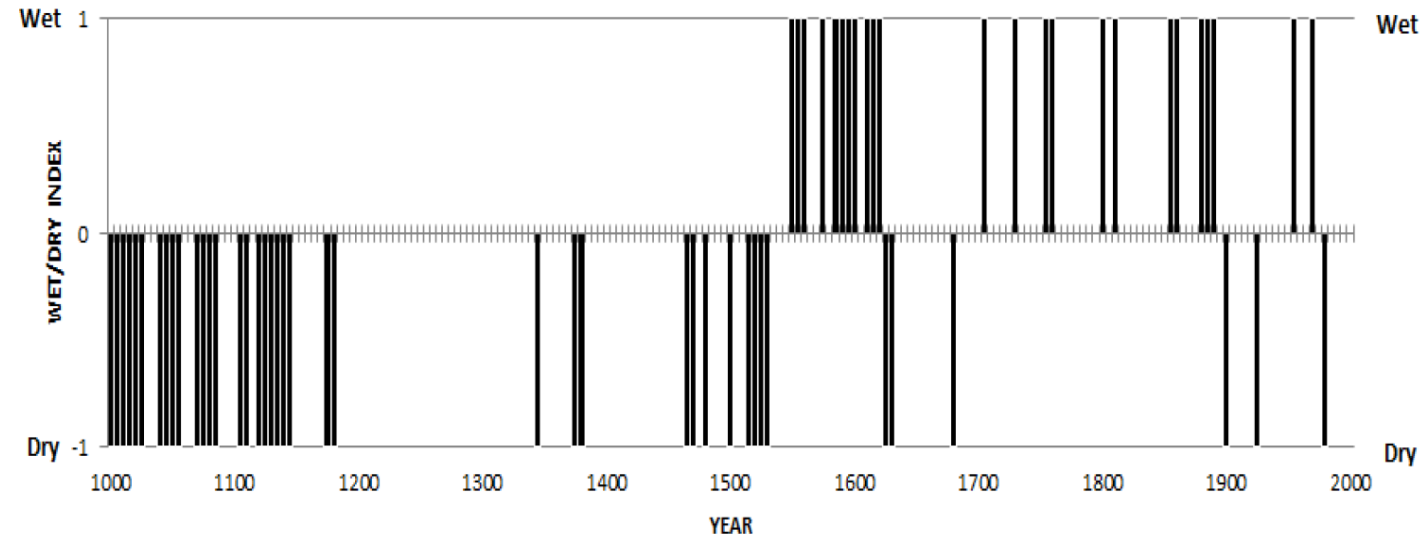




Drought – what does the past tell us?

Occurrence of wet and dry epochs

Very dry pre-1500 to 1000 (again, unlike anything seen in the instrumental period)



Total records wet/dry composite index

From Anna Flack's Honours (Nov 2015)



THE HUNTER HYDROGEN HUB

Why Hydrogen?

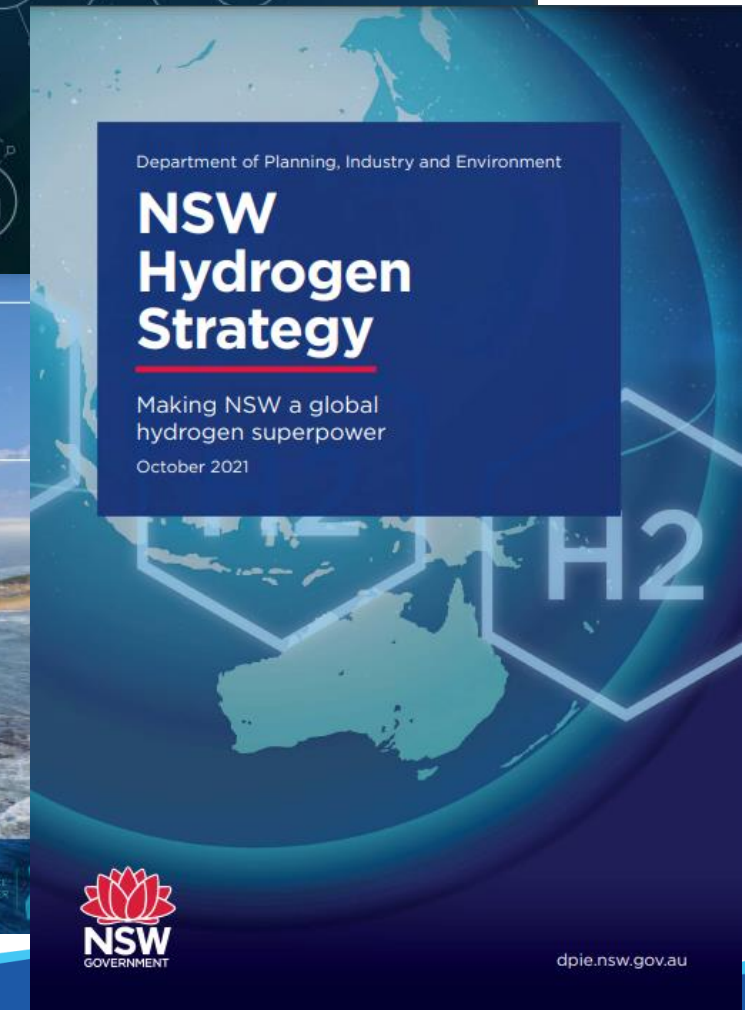
- Clean energy transition

Coordinated hub for hydrogen producers and consumers

- Upper Hunter
- Lower Hunter

Government support including

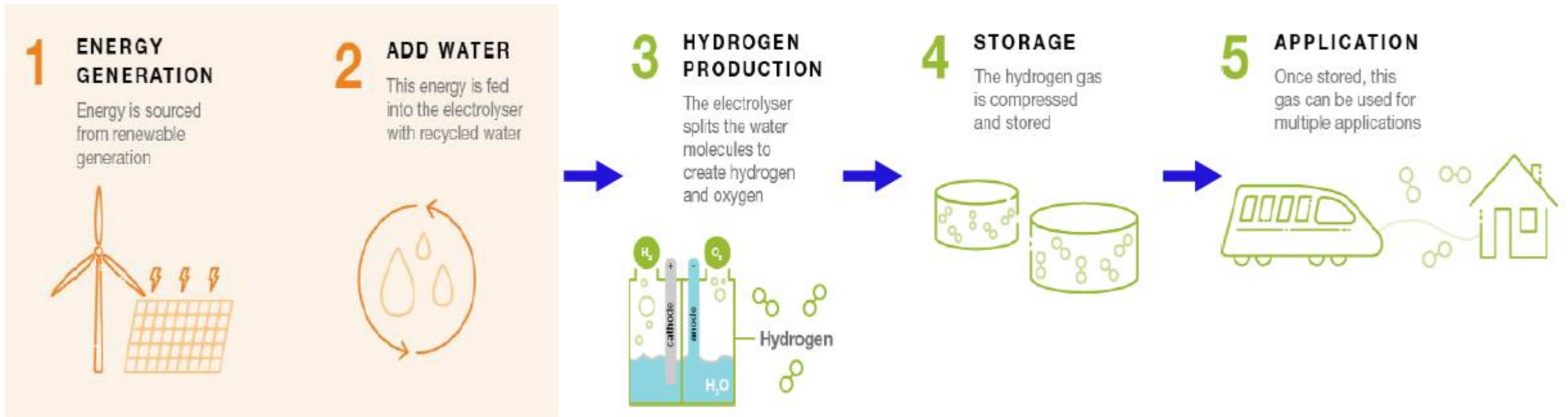
- State: \$70m Hunter/Illawarra
- Federal: \$82m Hunter





HYDROGEN ELECTROLYSIS - How much water is needed?

Figure 1: Hydrogen supply chain



Source: Jacobs (2022), Prospects for the Hydrogen Economy in the Hunter Valley and the Opportunities for Hunter Water

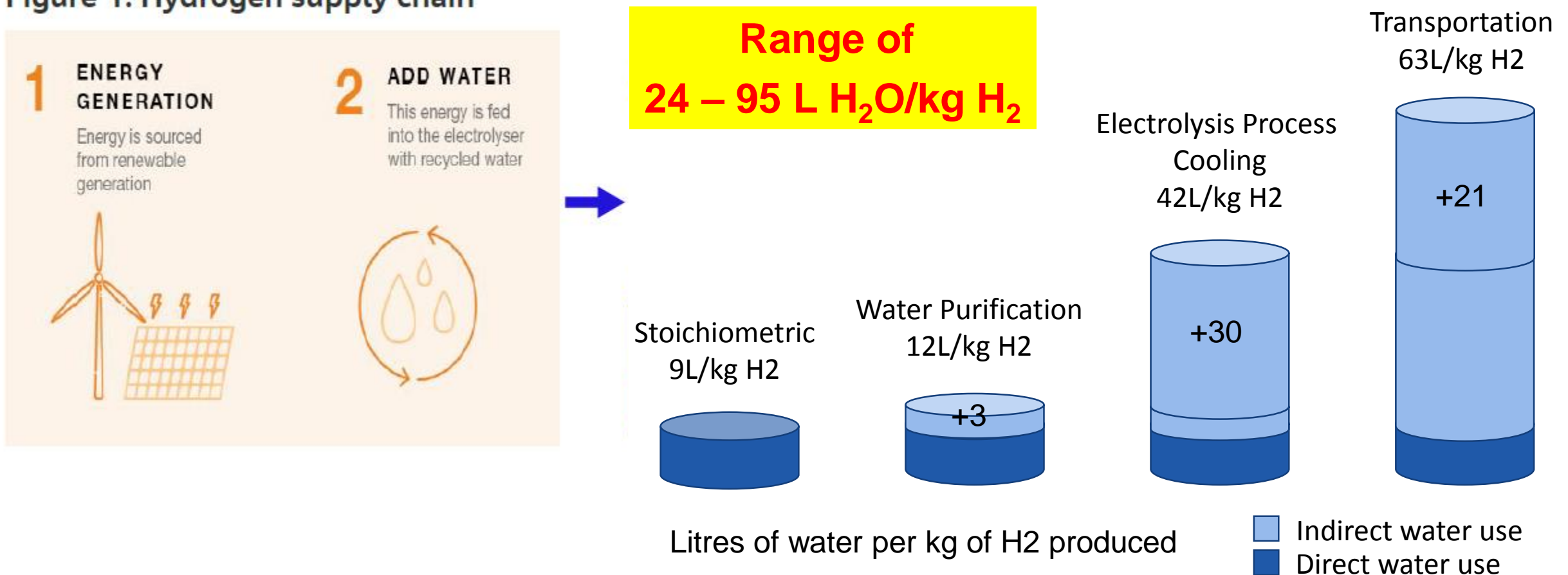


HYDROGEN ELECTROLYSIS - How much water is needed?

KEY POINTS

- Significant water demand uncertainty due to technology and value chain requirements

Figure 1: Hydrogen supply chain



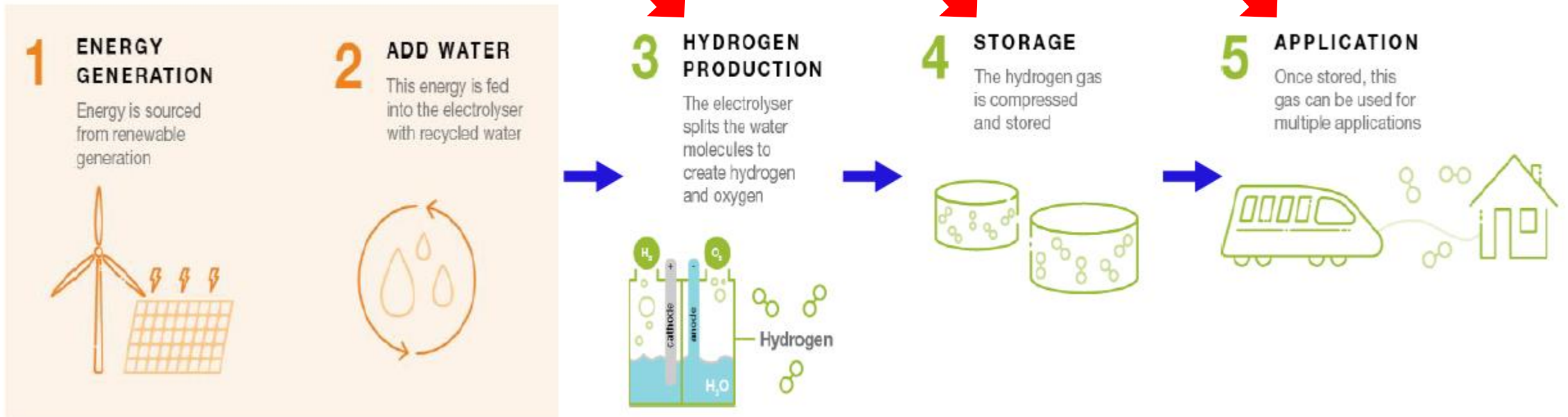


HYDROGEN ELECTROLYSIS - What water quality is needed?

KEY POINTS

- Water quality requirements through the value chain to be confirmed

Figure 1: Hydrogen supply chain





HYDROGEN DEMAND SCENARIOS

KEY POINTS

- Scale of Hydrogen Industry
- Lead times to production and ramp-up
- Location
- Water quality requirements through production chain

Year	Hydrogen production thousand tonnes pa			Water requirement million litres pa		
	Low	Medium	High	Low	Medium	High
2025	4	19	49	89	466	1,183
2030	35	72	155	830	1,721	3,730
2040	89	193	454	2,129	4,629	10,903

If supplied by drinking water:

- By 2040, hydrogen industry will increase water demand by 3 - 15%
- Brings forward the next water supply upgrade by 20 years

If supplied by recycled water:

- More than doubles existing recycled water demand
- By 2040, hydrogen could use 8 - 40% of wastewater from across the region



WATER SUPPLY OPTIONS - Reflecting community views in our decision making



2 information sessions about dam investigation areas were attended by almost **70** property owners and interested community members

Social media posts across our channels received

6,008 engagements

84,511 impressions



4,500 visits to the Lower Hunter Water Security Plan Your Voice webpage



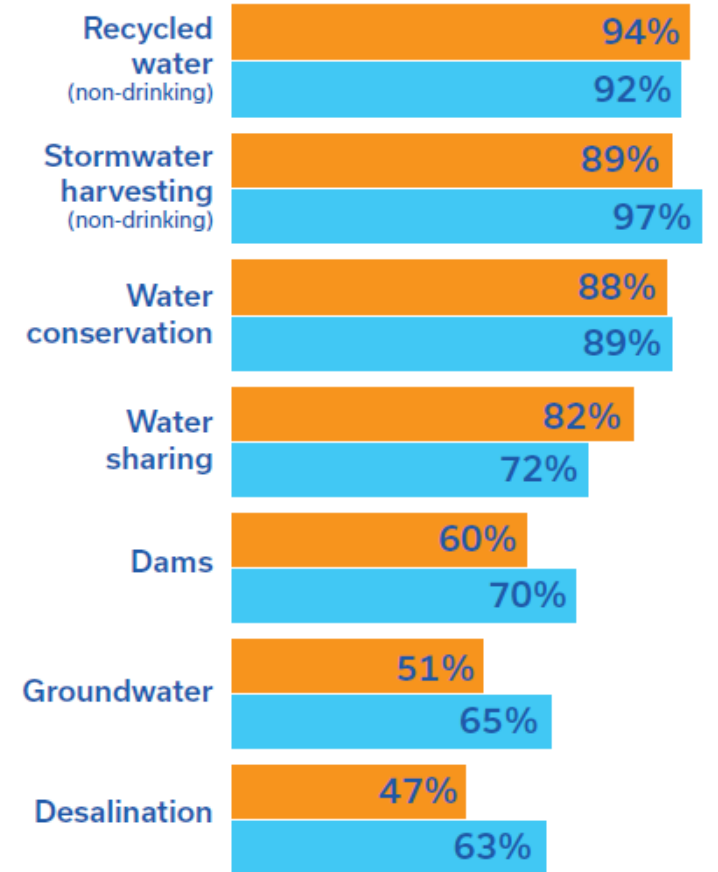
2 deliberative forums with a representative cross section of **153** community members

The Water Resilience Team attended **9** community events and engaged with about

640 people about the LHWSP



% open to consideration of that option



■ n=153 deliberative forum participants, June 2019
■ n=880 people completing a voting activity/survey on option preferences at community events and on the Your Voice webpage in 2019 and 2020 (to 30 October 2020).

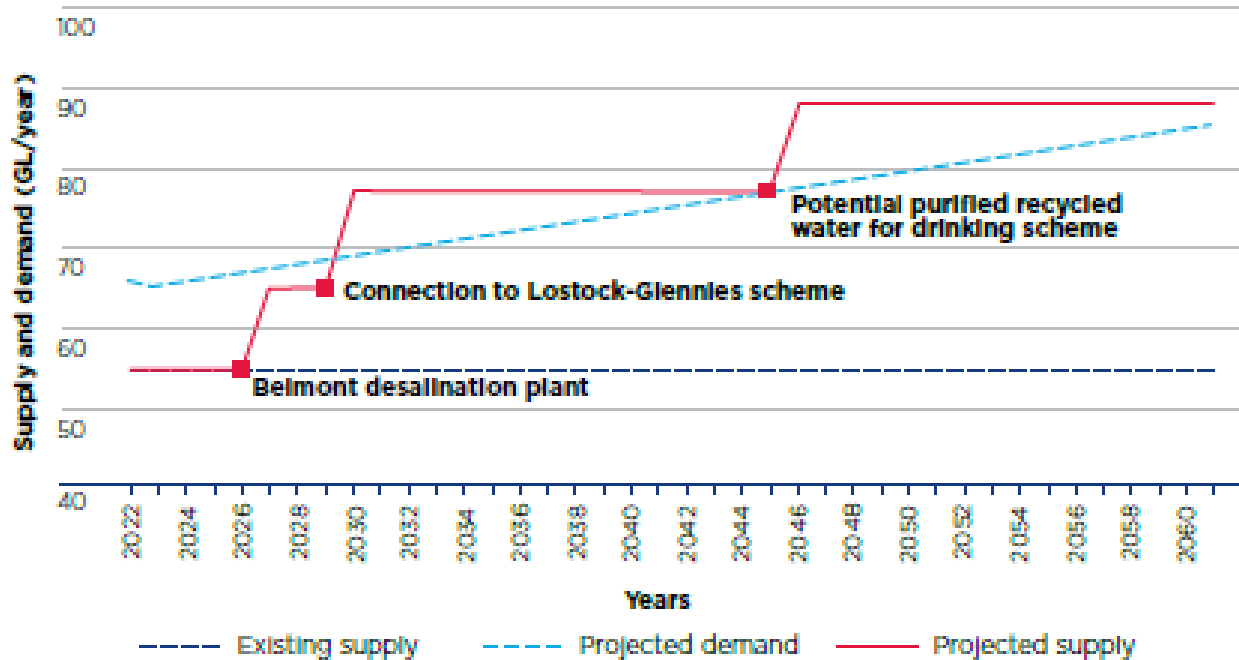


WATER SUPPLY OPTIONS

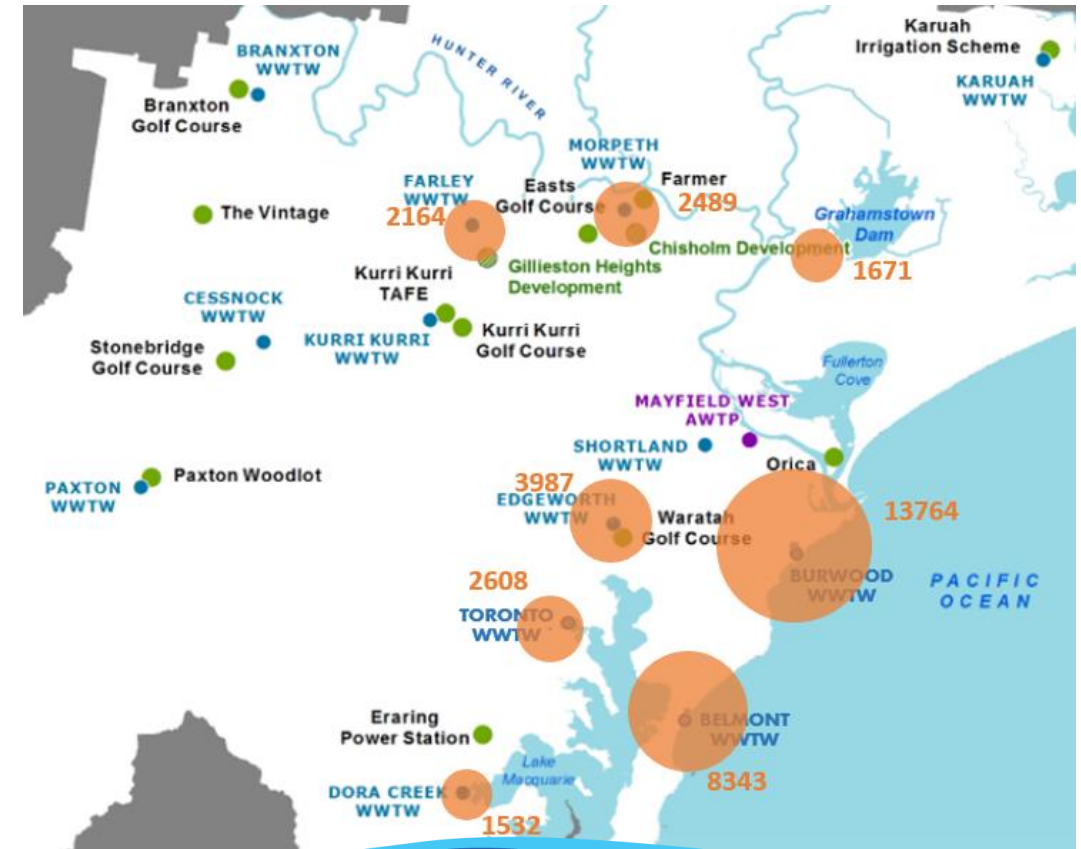
KEY POINTS

- Industry preferences for source water tbc
- Role of source water in defining Green Hydrogen

Drinking water: New demands for hydrogen would bring forward water supply augmentations included in LHWSP



Recycled water: Several sources of treated effluent are available for recycled water supply





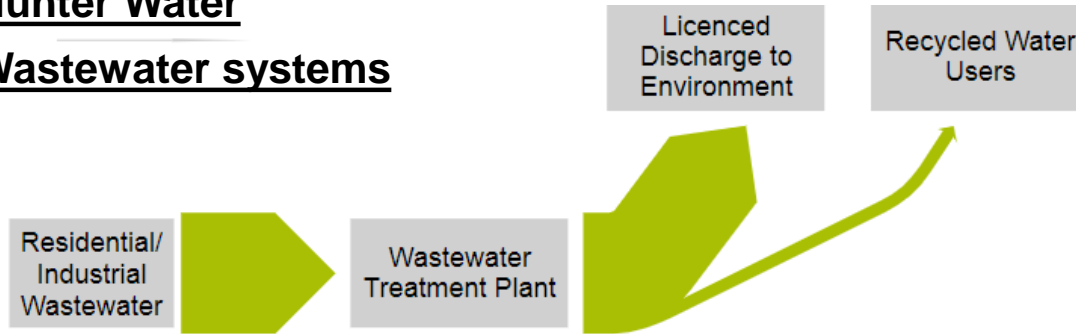
BRINE MANAGEMENT

KEY POINTS

- Brine streams can affect biological wastewater systems and EPA licence limits

Hunter Water

Wastewater systems



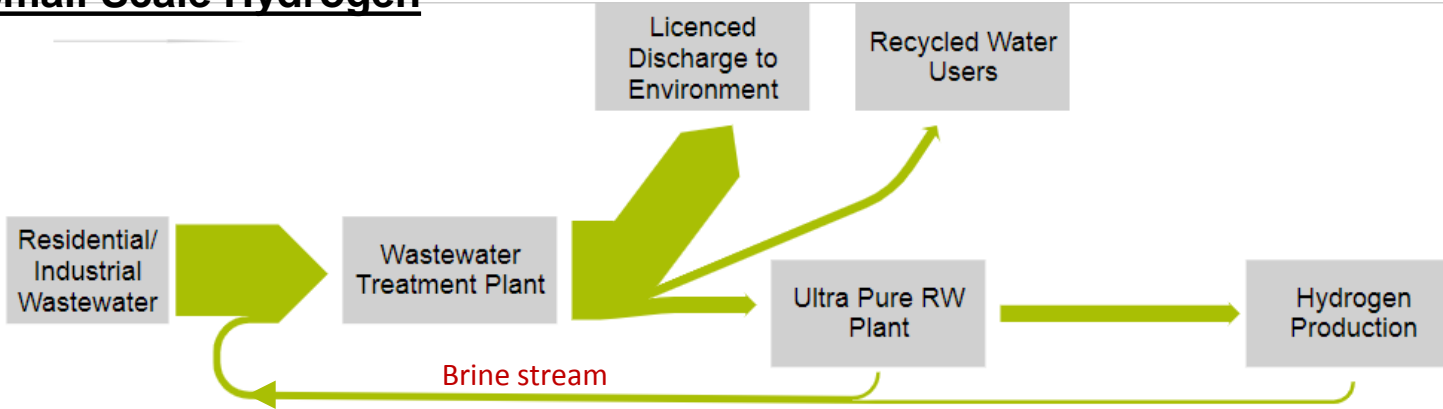


BRINE MANAGEMENT

KEY POINTS

- Brine streams can affect biological wastewater systems and EPA licence limits

Small Scale Hydrogen



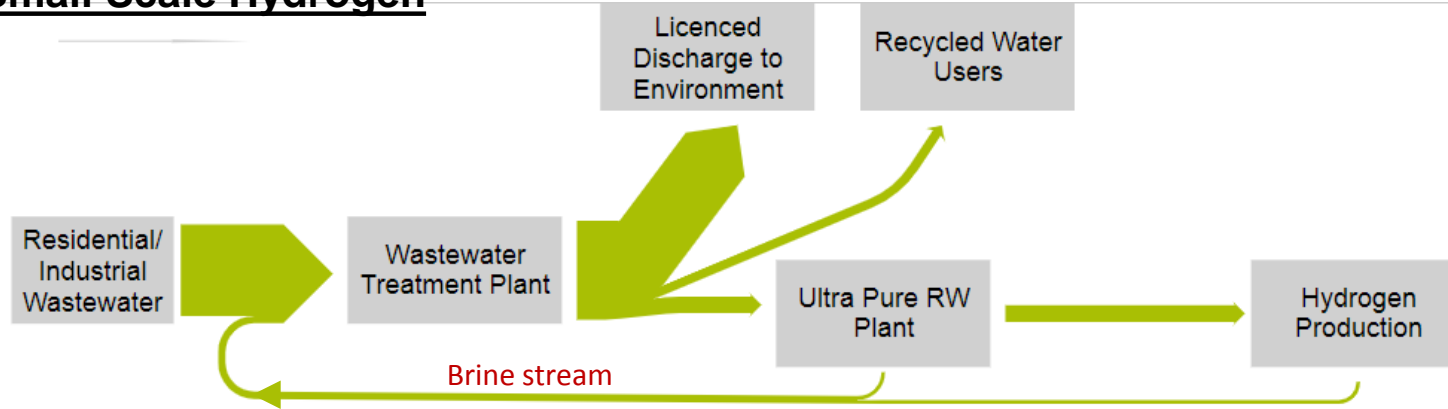


BRINE MANAGEMENT

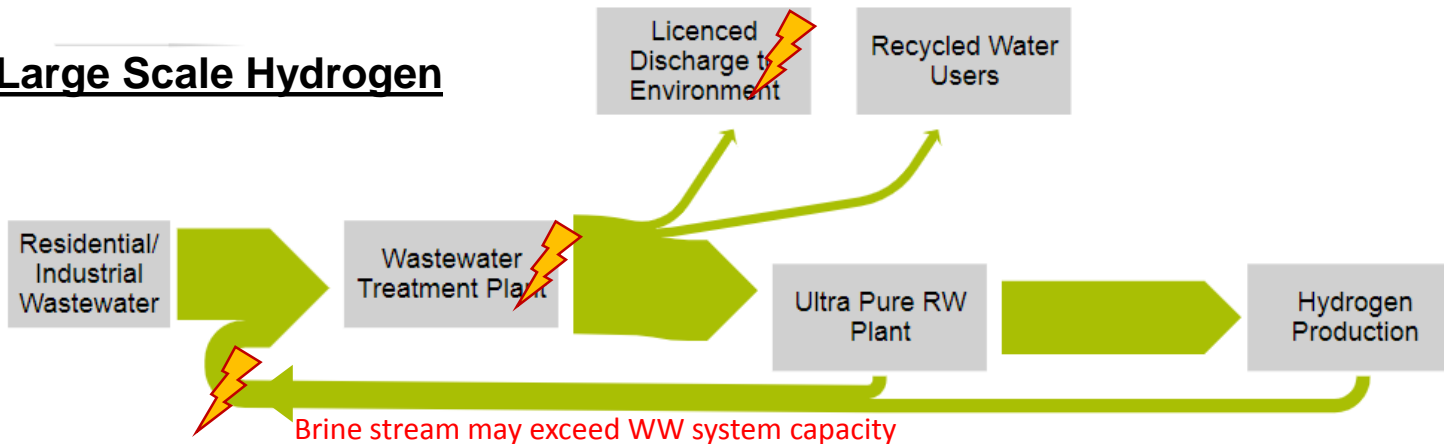
KEY POINTS

- Brine streams can affect biological wastewater systems and EPA licence limits

Small Scale Hydrogen



Large Scale Hydrogen





SUMMARY OF KEY WATER SERVICING CONSIDERATIONS

- **Water is an essential but a minor cost component** to support the establishment and growth of the Hydrogen industry
- **Multiple water servicing options are available** in the Lower Hunter
- A mid-range industry projection would mean a **material new water demand** (4,050 ML/a or 6% current) by 2040
- **Major investment required** in water supply and brine management to service mid and upper range industry projections
- **Servicing requirements remain highly uncertain** (location, water demands, water quality,) to inform servicing plans
- **Aligned decision making with industry** will optimise investment plans