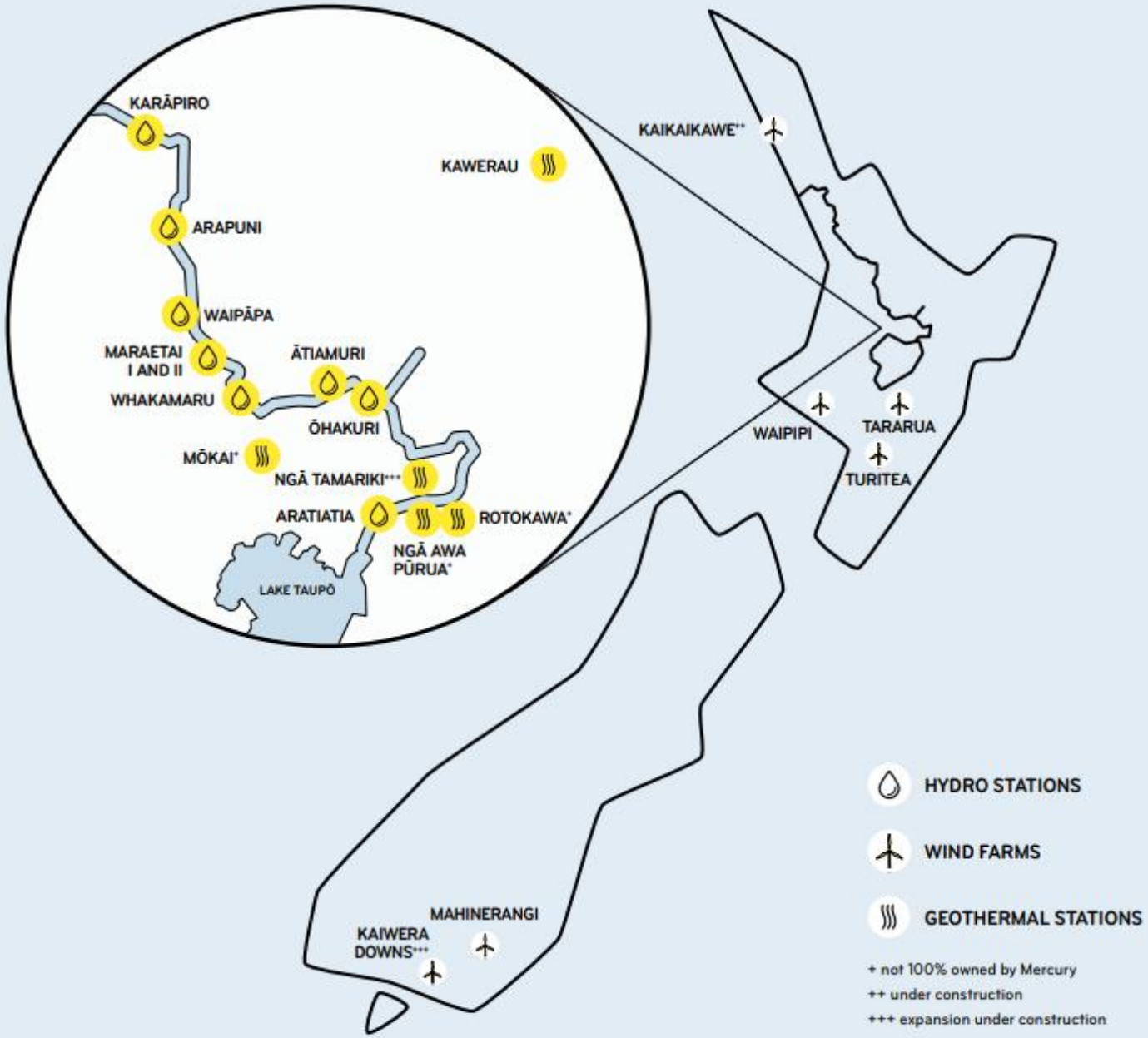
Mercury

BETTER
TODAY

BUILDING
TOMORROW

BRIGHTER
TOGETHER

Paulo Gottgtroy, PhD
Head Of Decision Science



WHO WE ARE

Sustainable generation: maximising our role in meeting New Zealand's electricity demand

Customer-centric services: delivering smarter digital services and experiences

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WE HAVE A STRATEGY TO ENHANCE OUR DECISION MAKING THROUGH THE DEVELOPMENT OF SUITE OF DECISION SUPPORT TOOLS

SWP

To inform Solutions Worth Pursuing

PWS

Identifying Problems Worth Solving for…

Customers…

Retail…

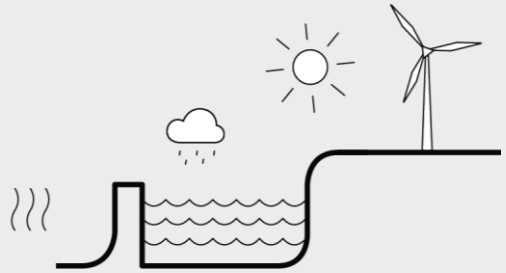
e.g. reduce energy use

e.g. reduce churn, reduce high bill calls

Portfolio…

e.g. best price

Generation…



e.g. optimising the river

DECISION SCIENCE

ENERGY MANAGER

DIGITAL CUSTOMER

RETAIL DECISION SUPPORT PRODUCT SQUAD/S

DIGITAL PORTFOLIO

TRADING DECISION SUPPORT PRODUCT SQUAD/S

DIGITAL RIVER

GENERATION DECISION SUPPORT PRODUCT SQUAD/S

Using Digital Twins & Artificial Intelligence to Manage Generation Resources

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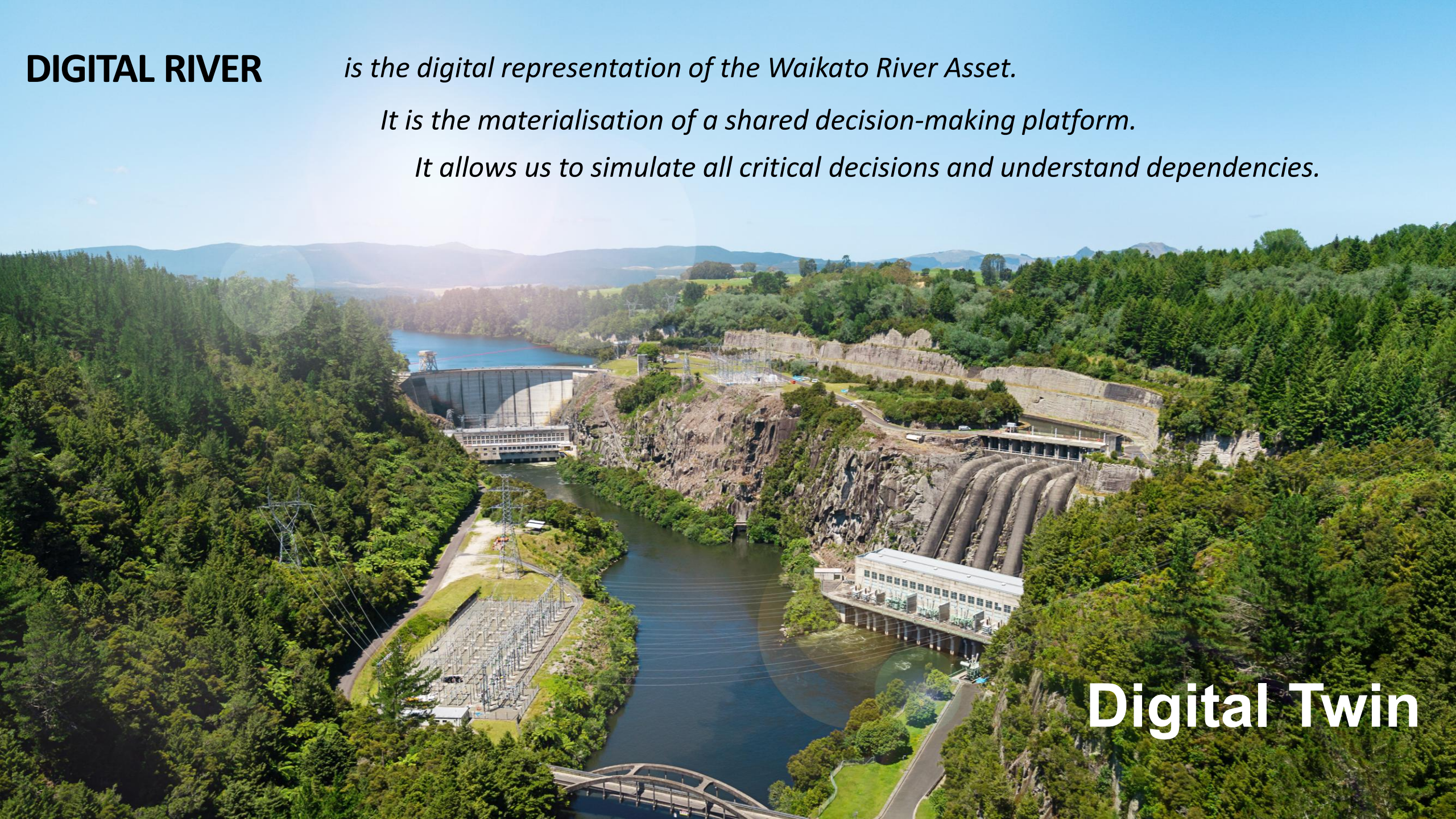
DIGITAL RIVER *is the digital representation of the Waikato River Asset.*

It is the materialisation of a shared decision-making platform.

It allows us to simulate all critical decisions and understand dependencies.



WAIKATO HYDRO SCHEME

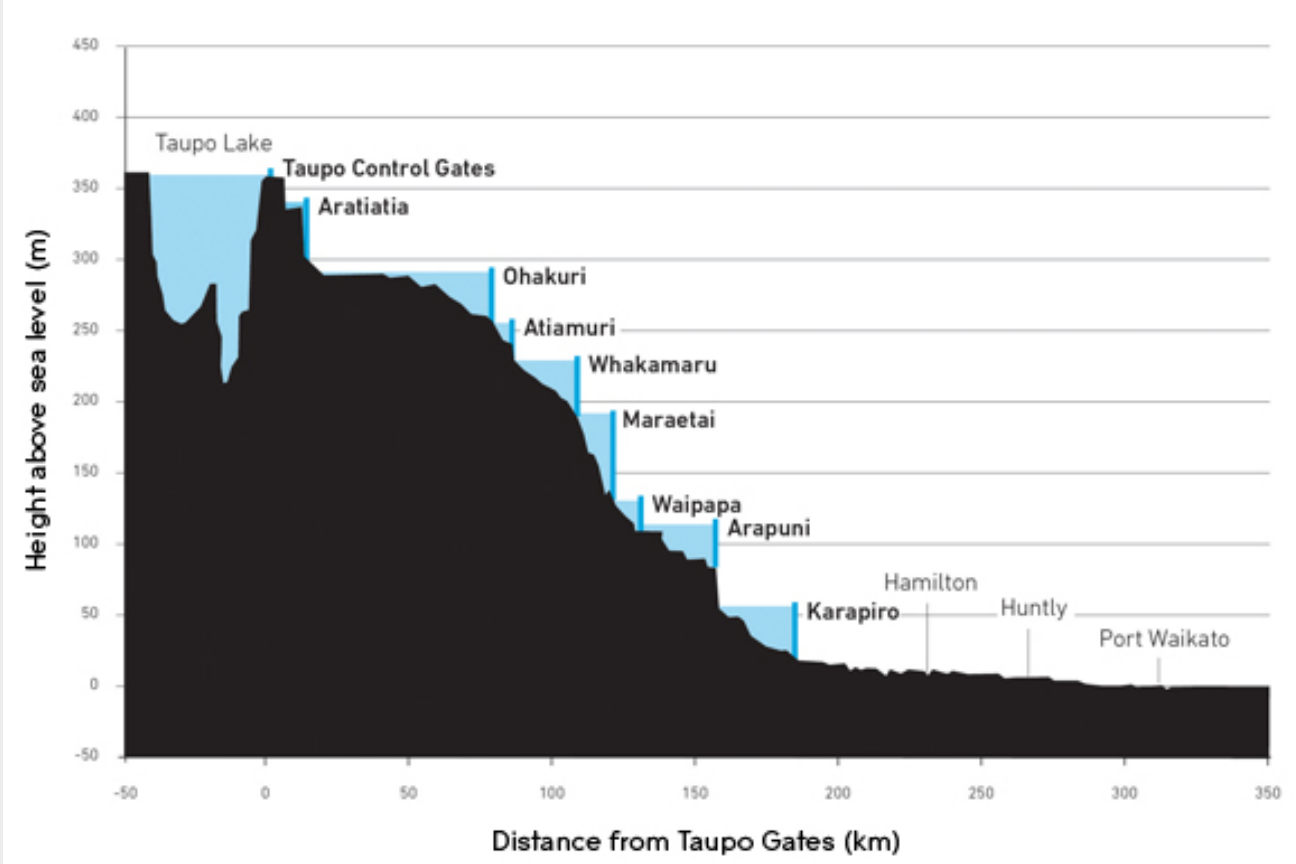
> The hydro stations are located on the Waikato River, and each station flows into the next in a chain

> The stations are each unique in their size, how big their lakes are and how many generating units each station has.

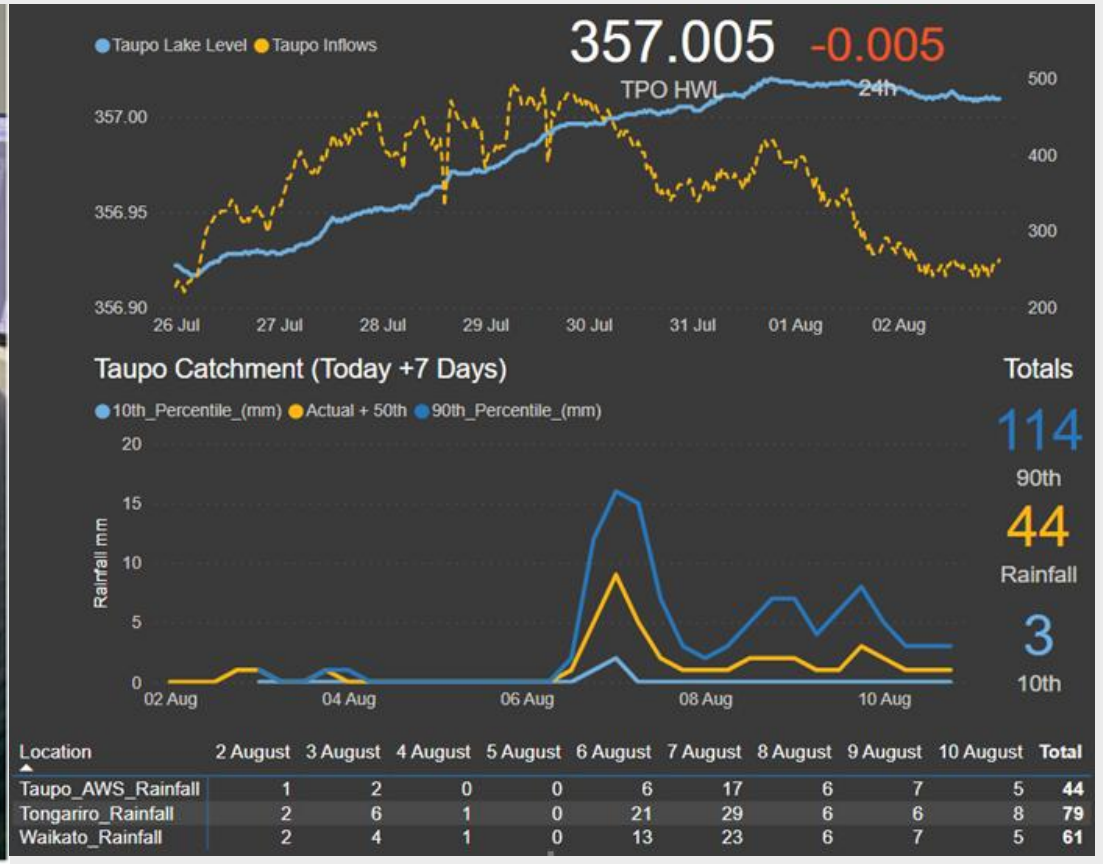
> It takes water around 18 hours to flow from Taupo Control Gates to Karapiro

> Stations are interconnected

> We have several constraints, which we need to take of to keep our “license to operate”



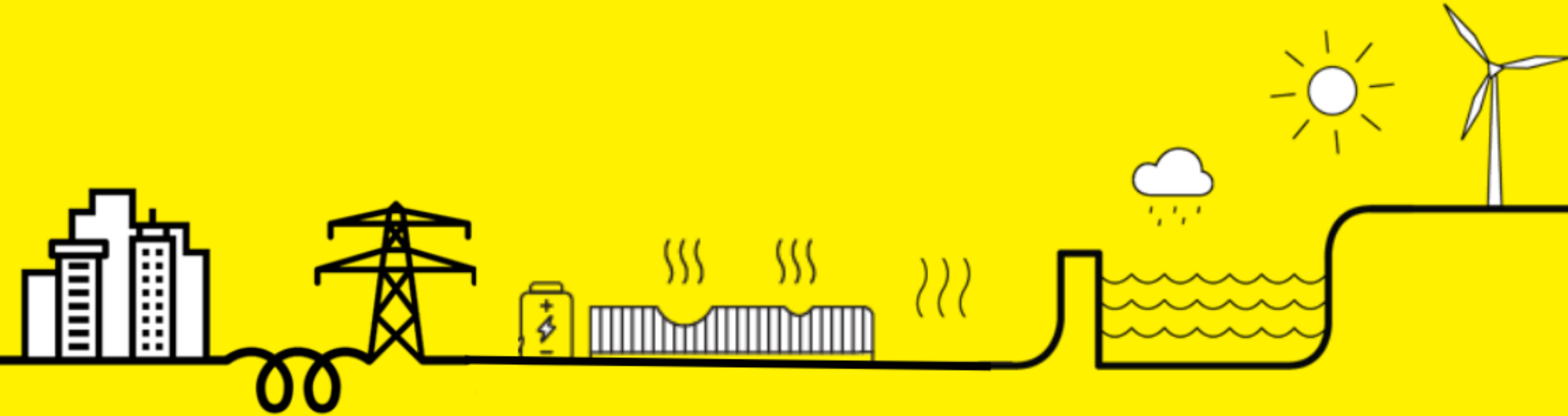
DECISION SUPPORT VS DECISION MANAGEMENT



Location	2 August	3 August	4 August	5 August	6 August	7 August	8 August	9 August	10 August	Total
Taupo_AWS_Rainfall	1	2	0	0	6	17	6	7	5	**44**
Tongariro_Rainfall	2	6	1	0	21	29	6	6	8	**79**
Waikato_Rainfall	2	4	1	0	13	23	6	7	5	**61**

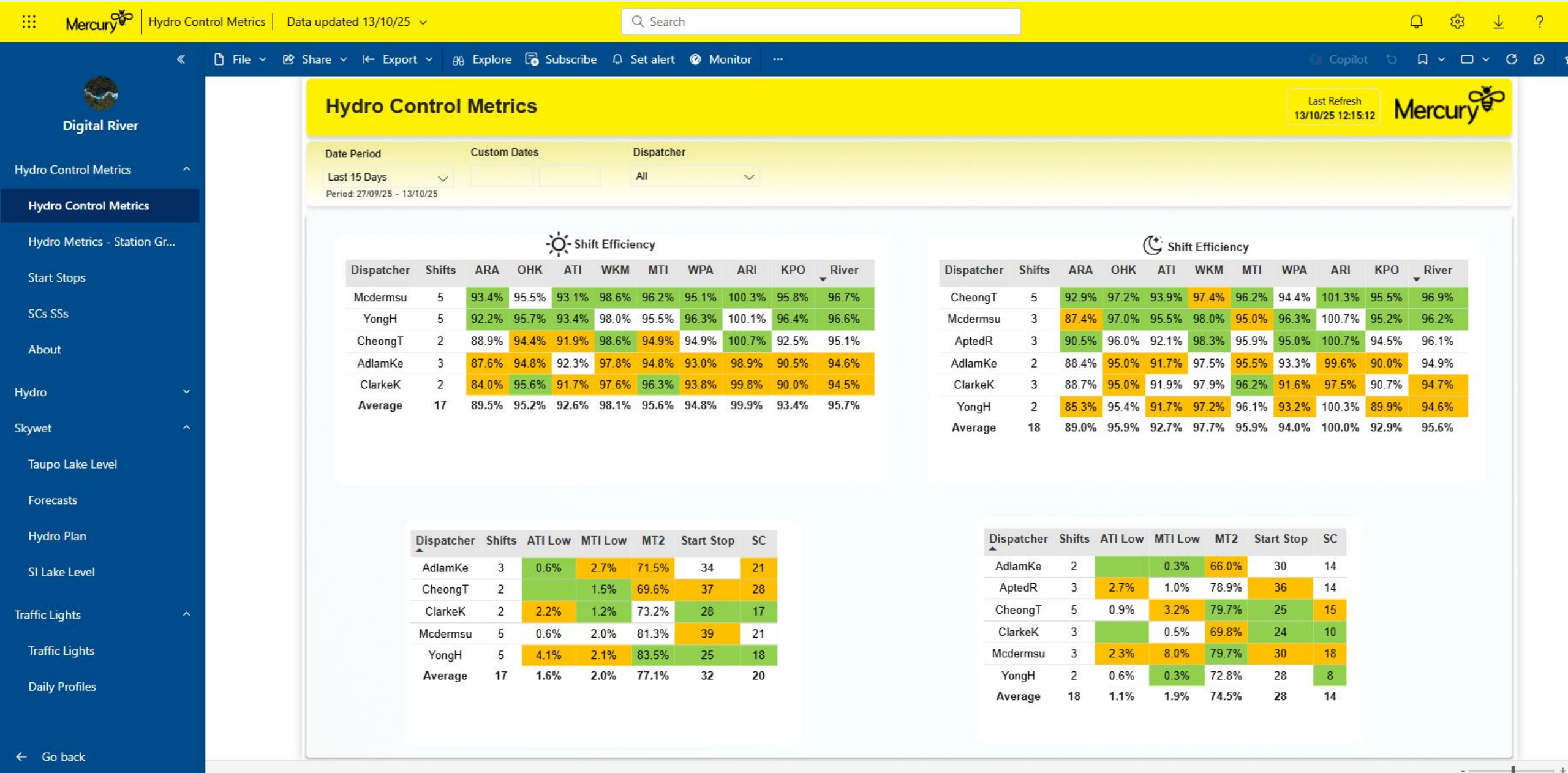
WHOLESALE SUPPORT

Digital River

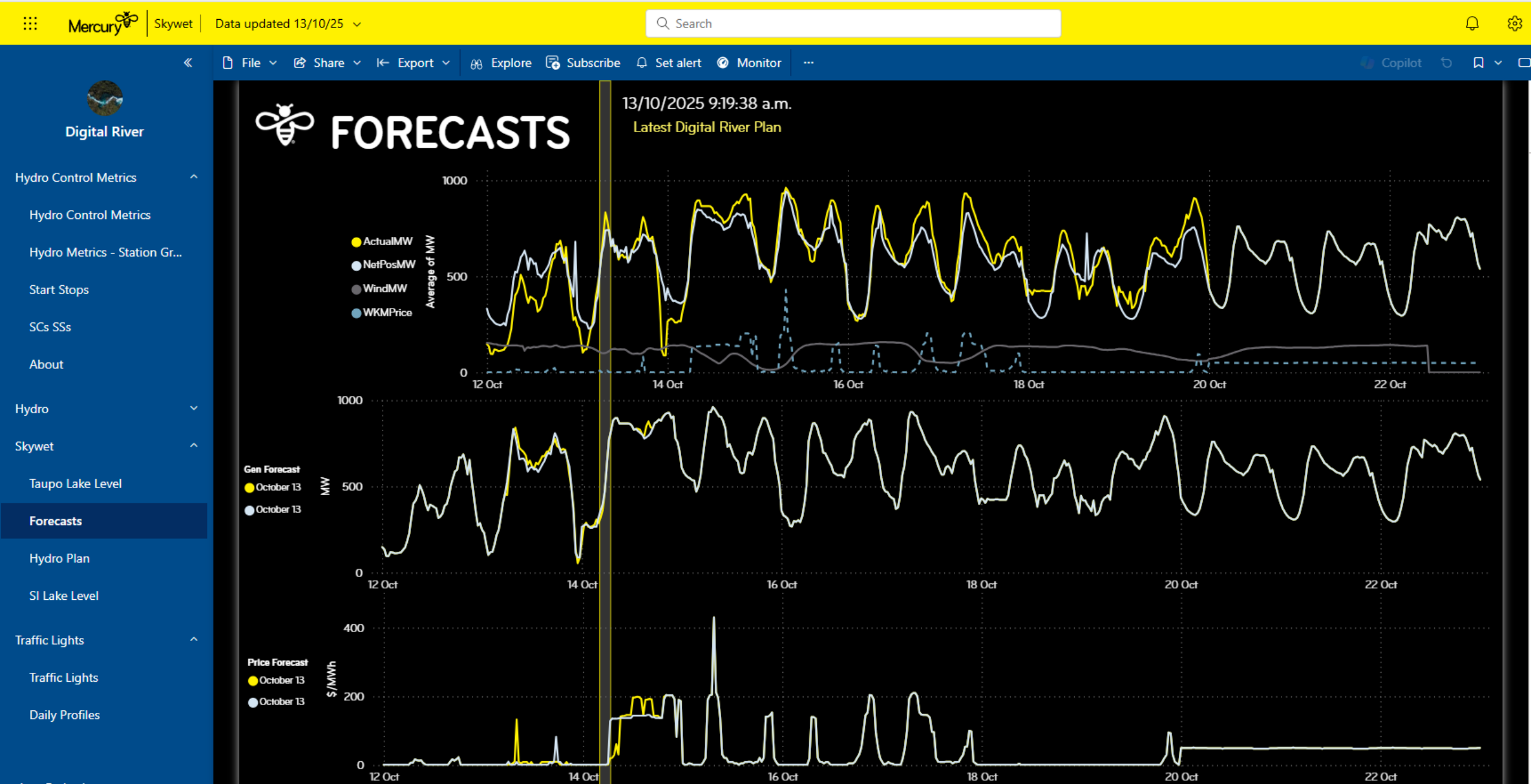


DIGITAL RIVER - WHOLESALE PLANS

DIGITAL RIVER 2.0 – HIGH-PERFORMANCE DECISION MAKING FRAMEWORK



DIGITAL RIVER - DECISION SUPPORT AT ALL LEVELS



DIGITAL RIVER - TACTICS

DIGITAL RIVER - HIGH PERFORMANCE TEAM

Mercury | Hydro Control Metrics | Data updated 13/10/25

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Digital River

- Hydro Control Metrics
  - Hydro Control Metrics
  - Hydro Metrics - Station ...
  - Start Stops
  - SCs SSs
  - About
- Hydro
- Skywet
  - Taupo Lake Level
  - Forecasts
  - Hydro Plan
  - SI Lake Level
- Traffic Lights
  - Traffic Lights
  - Daily Profiles

Go back

Hydro Metrics - Station Graph

Date Period: Last 15 Days
Period: 27/09/25 - 13/10/25

Custom Dates

Dispatcher: All

Last Refresh: 13/10/25 12:15:12

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Shift Efficiency

Dispatcher	Shifts	ARA	OHK	ATI	WKM	MTI	WPA	ARI	KPO	River
AdlamKe	3	87.6%	94.8%	92.3%	97.8%	94.8%	93.0%	98.9%	90.5%	94.6%
CheongT	2	88.9%	94.4%	91.9%	98.6%	94.9%	94.9%	100.7%	92.5%	95.1%
ClarkeK	2	84.0%	95.6%	91.7%	97.6%	96.3%	93.8%	99.8%	90.0%	94.5%
Mcdermsu	5	93.4%	95.5%	93.1%	98.6%	96.2%	95.1%	100.3%	95.8%	96.7%
YongH	5	92.2%	95.7%	93.4%	98.0%	95.5%	96.3%	100.1%	96.4%	96.6%
Average	**17**	**89.5%**	**95.2%**	**92.6%**	**98.1%**	**95.6%**	**94.8%**	**99.9%**	**93.4%**	**95.7%**

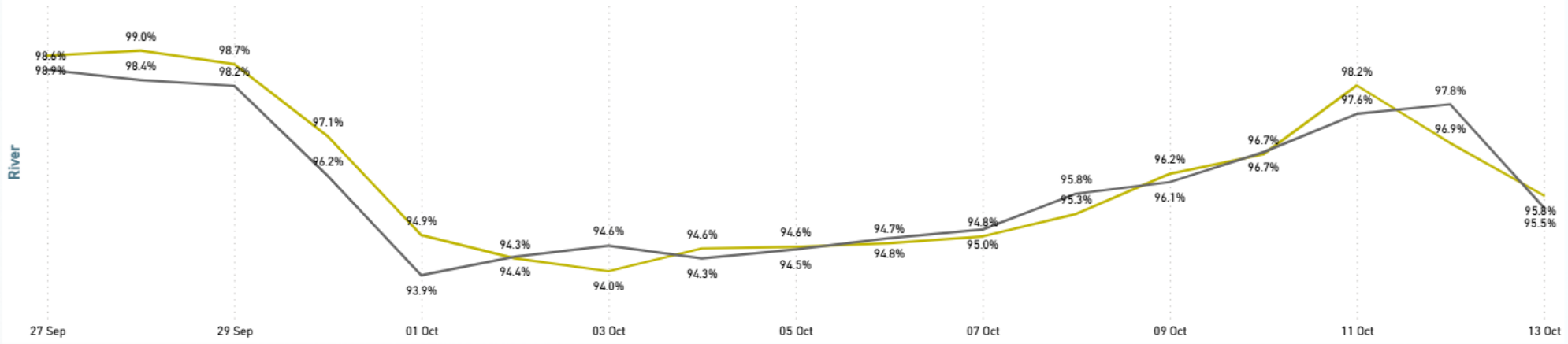
Shift Efficiency

Dispatcher	Shifts	ARA	OHK	ATI	WKM	MTI	WPA	ARI	KPO	River
AdlamKe	2	88.4%	95.0%	91.7%	97.5%	95.5%	93.3%	99.6%	90.0%	94.9%
AptedR	3	90.5%	96.0%	92.1%	98.3%	95.9%	95.0%	100.7%	94.5%	96.1%
CheongT	5	92.9%	97.2%	93.9%	97.4%	96.2%	94.4%	101.3%	95.5%	96.9%
ClarkeK	3	88.7%	95.0%	91.9%	97.9%	96.2%	91.6%	97.5%	90.7%	94.7%
Mcdermsu	3	87.4%	97.0%	95.5%	98.0%	95.0%	96.3%	100.7%	95.2%	96.2%
YongH	2	85.3%	95.4%	91.7%	97.2%	96.1%	93.2%	100.3%	89.9%	94.6%
Average	**18**	**89.0%**	**95.9%**	**92.7%**	**97.7%**	**95.9%**	**94.0%**	**100.0%**	**92.9%**	**95.6%**

ARA | OHK | ATI | WKM | MTI | WPA | ARI | KPO | River

River Efficiency

Shift ● D ● N



DIGITAL RIVER –DISPATCH RECOMMENDATION

Recommendation generated at 13/10/25 15:30:12

Station	Current MW	Current Spill	Reco MW	Reco Spill	Reco Efficiency	Accept Reco
ARA	77	-	72	-	89.6%	☐
OHK	82	-	84	80	75.0%	☐
ATI	55	-	68	-	91.6%	☐
WKM	123	-	124	-	96.6%	☐
MTI	243	-	235	-	95.9%	☐
WPA	54	-	51	-	96.3%	☐
ARI	158	102	142	-	99.2%	☐
KPO	74	125	72	-	97.1%	☐

Reason for Rejection (required if recommendation is not accepted for all stations) :

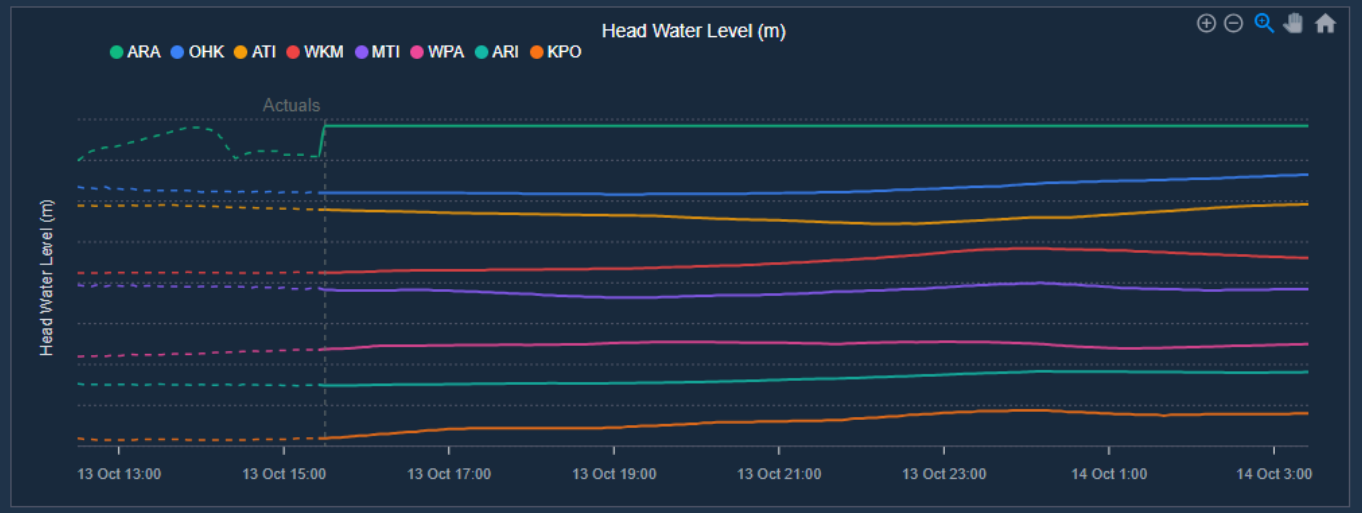
Choose a Reason to Reject....

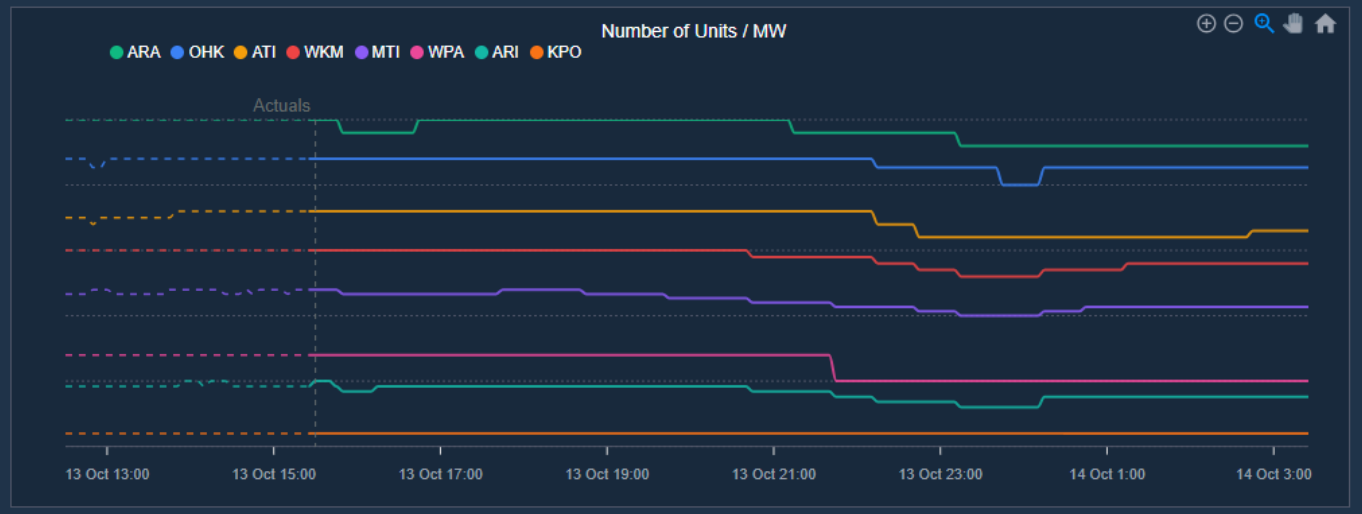
Submit Feedback

Selected Stations (8 of 8) Select All Clear

ARA OHK ATI WKM MTI WPA ARI KPO

Station data refreshed at 13/10/25 15:42:34

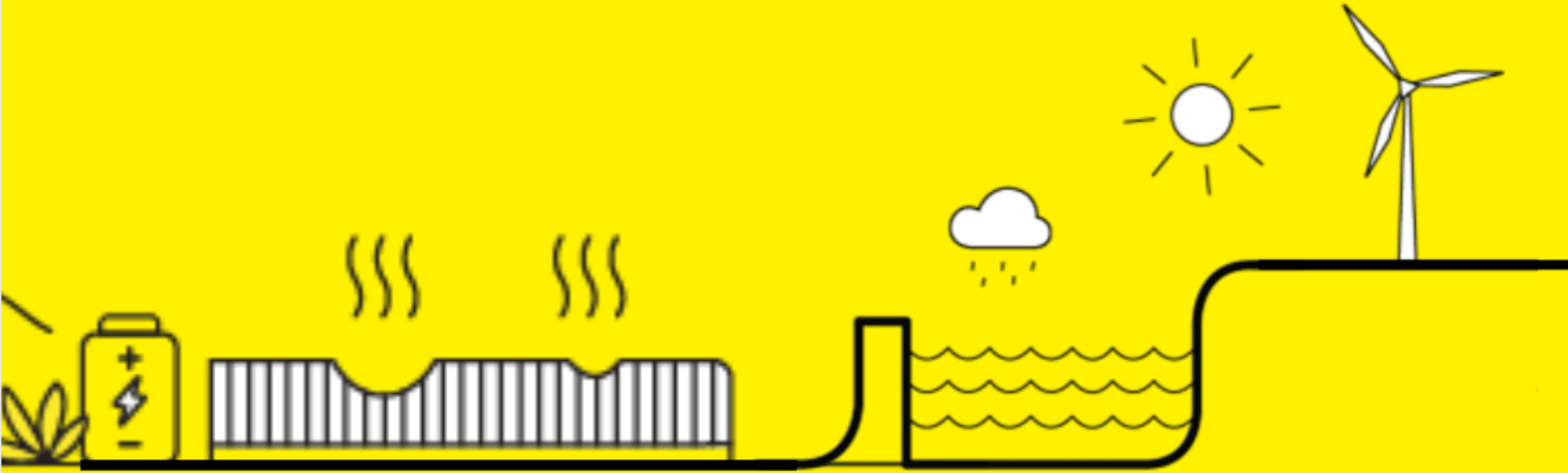




DIGITAL RIVER - SIMULATION

GENERATION ROADMAP

Geothermal Optimisation



Can we build a ‘Digital River’ for Kawerau????

DIGITAL KAG (KAWERAU)

- **Digital twin** with a **thermodynamic model** that can **predict** the result of changes to temperature/cooling, parasitic load, well production and controller setpoint changes.

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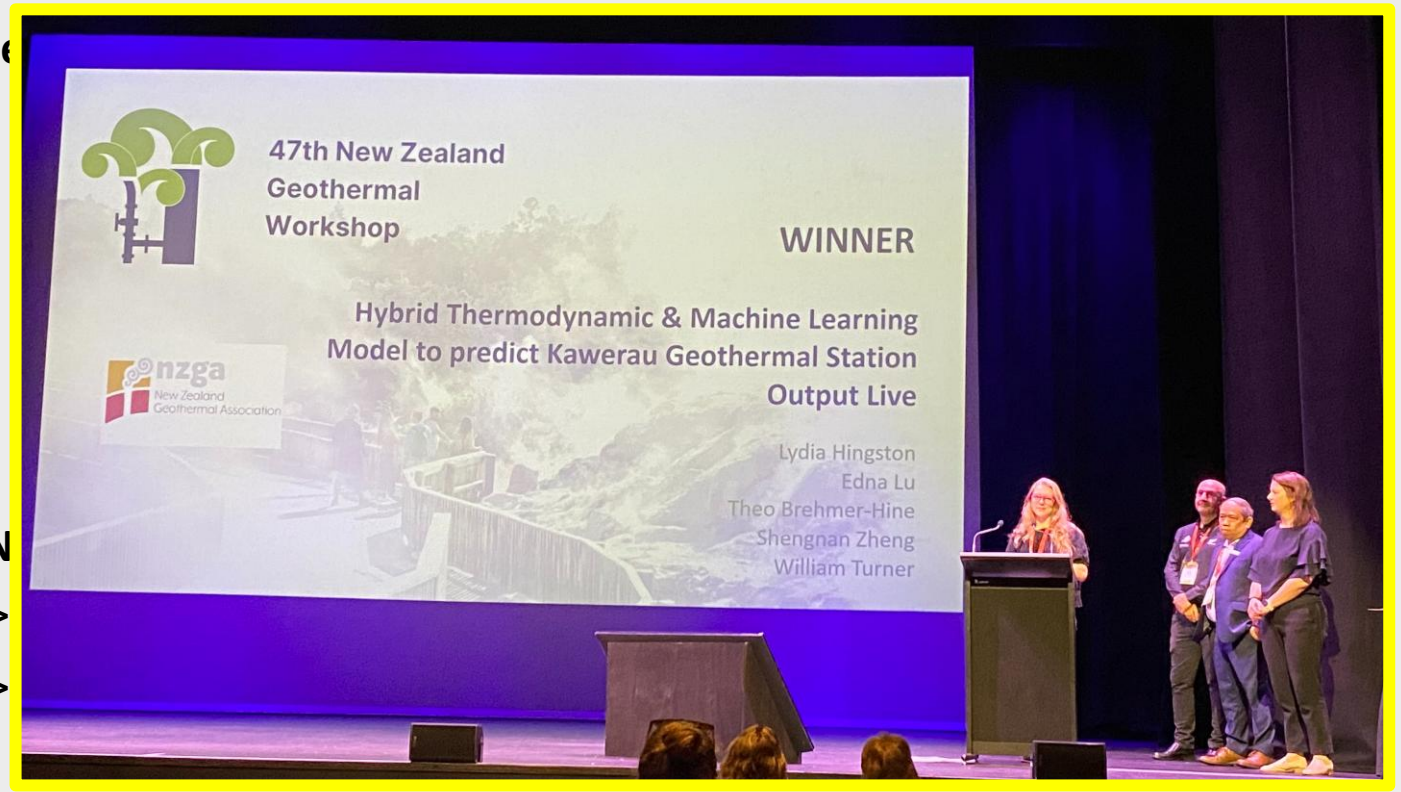
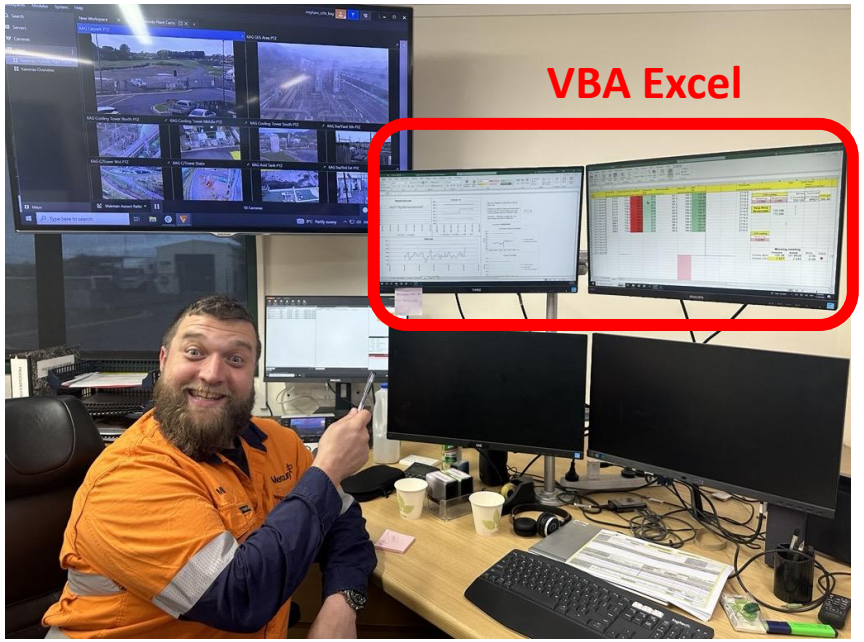


> Recommends LP set point …

> Helping Build the ***Gap-to-Capacity*** & ***Gap-to-Potential***

STATION ENGAGEMENT - MONITORING

> The Operating Table and Set Point Optimiser dashboards are currently displayed at the operator desk 24/7



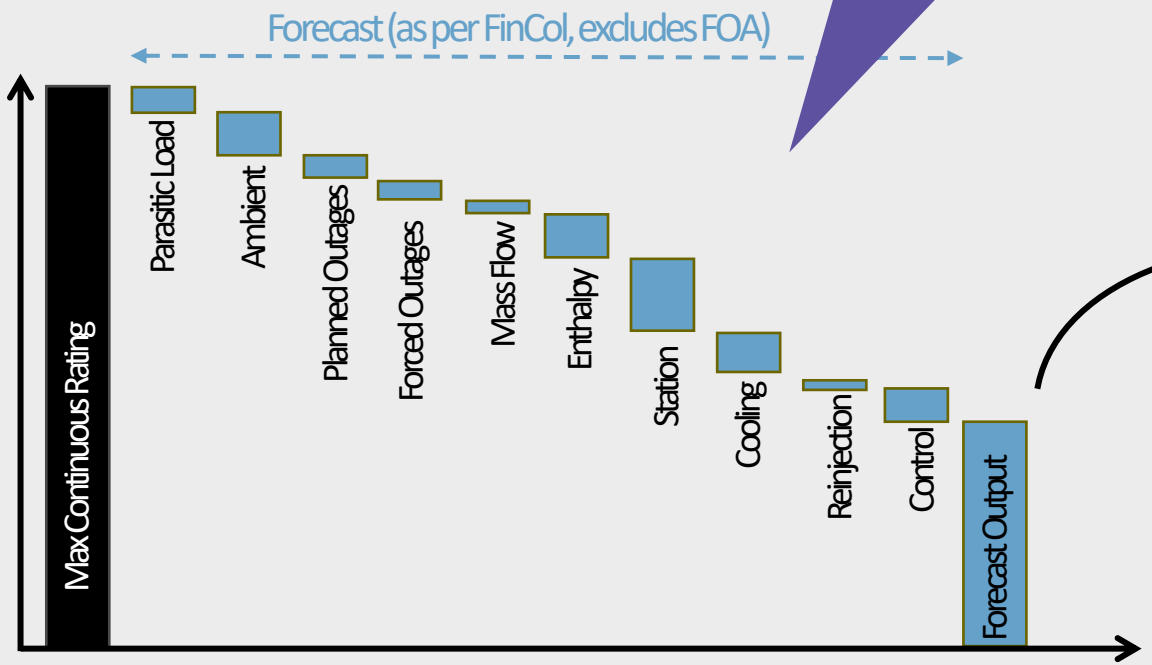
MACHINE LEARNING

GENERATION OPTIMISATION – WAYS OF WORKING

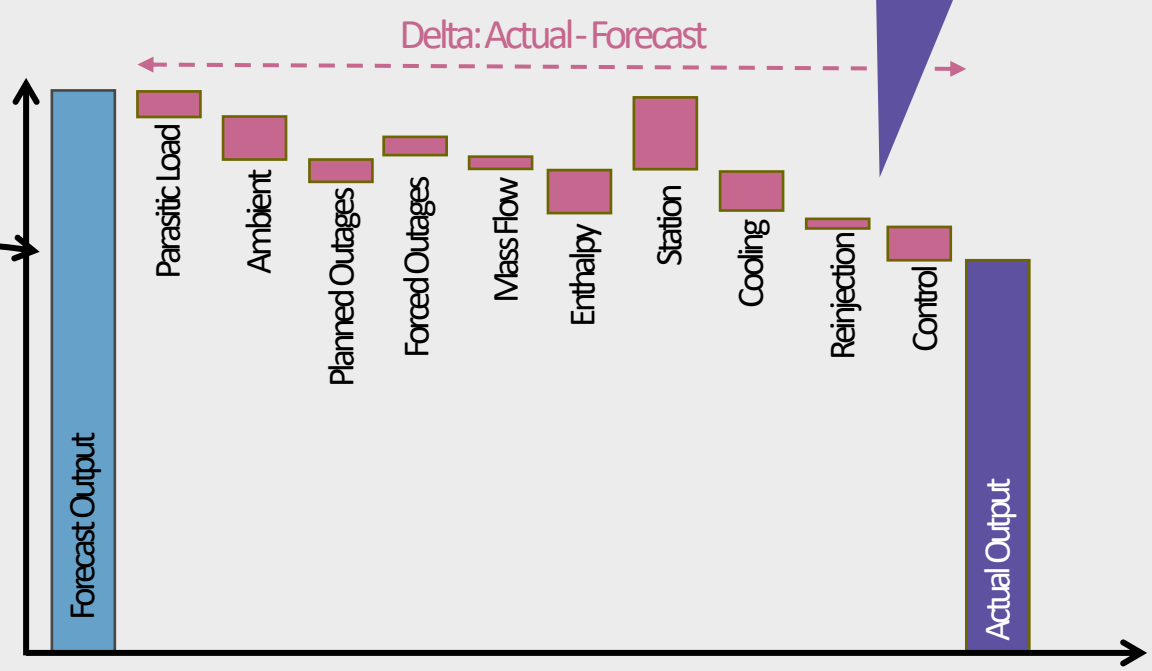
Where do we think we will lose MW?

How do we compare to our prediction? What are we missing?

Gap to ***Capacity***



Gap to ***Potential***

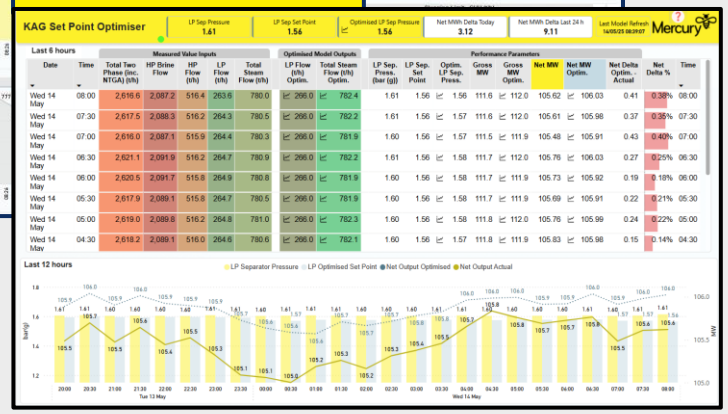


Right Tool for the Job

Operators

Operating Dashboards

LP Set Point Optimiser

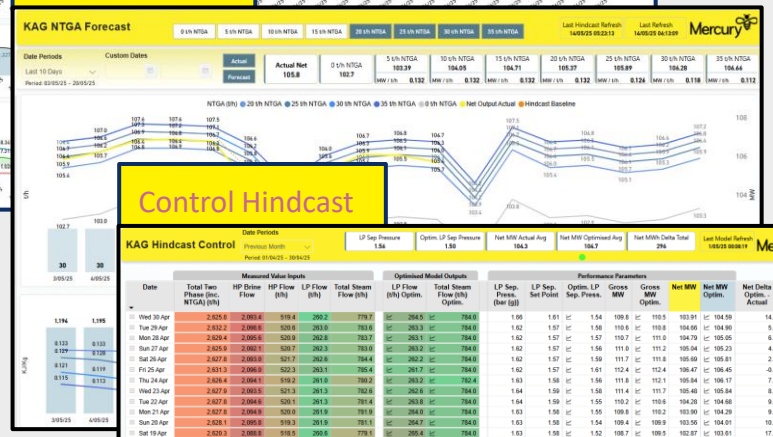


How am I running the plant right now?

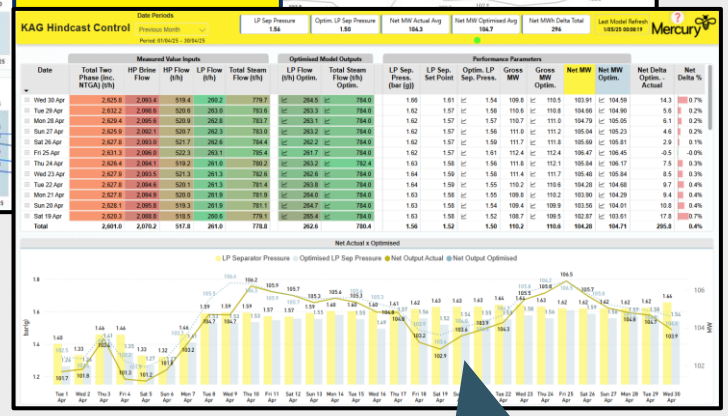
Management

NTGA Forecast

NTGA Hindcast



Control Hindcast

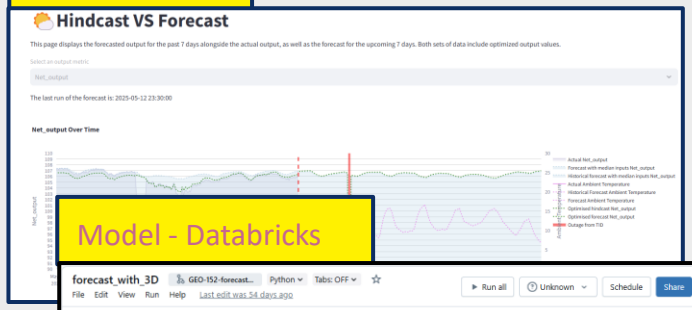


What NTGA steam flow do we need for the next fortnight?

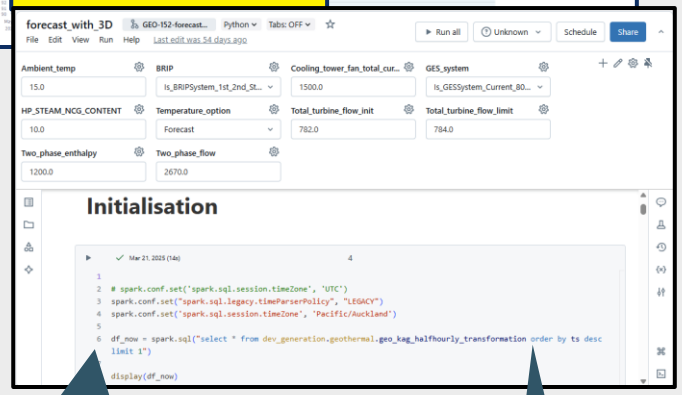
How is my team operating the plant?

Engineer

Model - App



Model - Databricks



What was our gap-to-potential?

What's going on in the plant?

DSCoE Roadmap

FY26 Focus: Generation Digital Uplift

Production

- Move Kawerau to Production

Digital Rotokawa

- RKA and NAP holistic digital twin

FINOPs

- Observability and budget management

Digi KAG 2.0

- Continue Optimisation

July FY26

FY28 Focus: Generation Optimisation Models

FY27 Focus: Operation Optimisation Models

Digital Nga Tamariki

- Nga Tamariki holistic digital twin

DS Models

- Gap to Potential
- Reservoir Optimisation

Discovery

- TBC

Digital Mokai

- MKA holistic digital twin

July FY28

July FY27

DS Models

- TBC

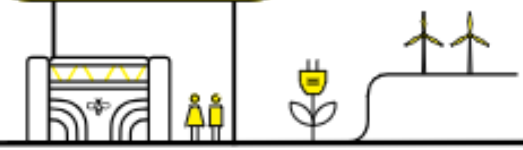
Predictive Maintenance

- TBC

DS Models

- TBC

Portfolio Optimisation



July FY29

July FY30

June FY30

To the future...