

NETR DASHBOARD WEEKLY PROGRESS

17 Oktober 2024

Weekly Scope

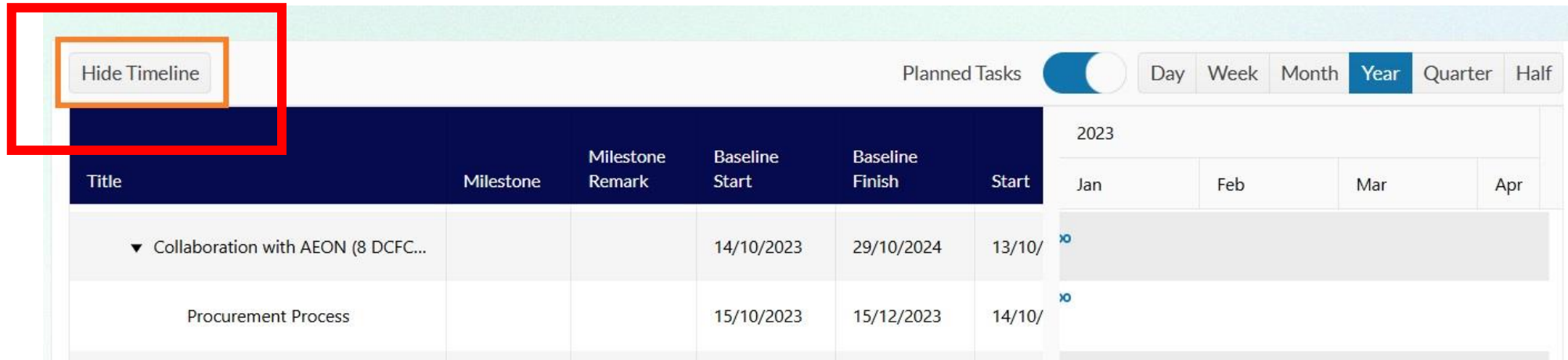
- To confirm completed task but pending user confirmation list.
- To show item that already submitted to vendor

COMPLETED TASK, PENDING USER CONFIRMATION

#	Module	Items	PIC	Category	Date Request	Type of request	Date Completed	Status	User Completion Acknowledgment
	Project Milestone	Project milestone month not in sequence (Fix to follow actual finish month)	Johan	Coding	1 Okt	Enhancement	11 Okt	Complete	
	Project Milestone	Solar park milestone is not 100%	Johan	Data Entry	26 September	New		COMPLETE	
	Gantt Chart	Gantt chart hide Timeline function - Push to prod	Johan	Coding	26 July	Enhancement	26 July	Complete	
	Project Milestone (Timeline)	Dashboard key milestone arrow. After move to production server, Red triangle in the milestone is not moved automatically instead need to move manually	Johan	Data entry	23 August	Enhancement	25 August	Complete	
	Project Report	Editable headline for report - Push to prod	Johan	Coding	8 August	New	16 August	Complete	
	Project Report	Report log - Push to prod	Johan	Coding	8 August	New	16 August	Complete	

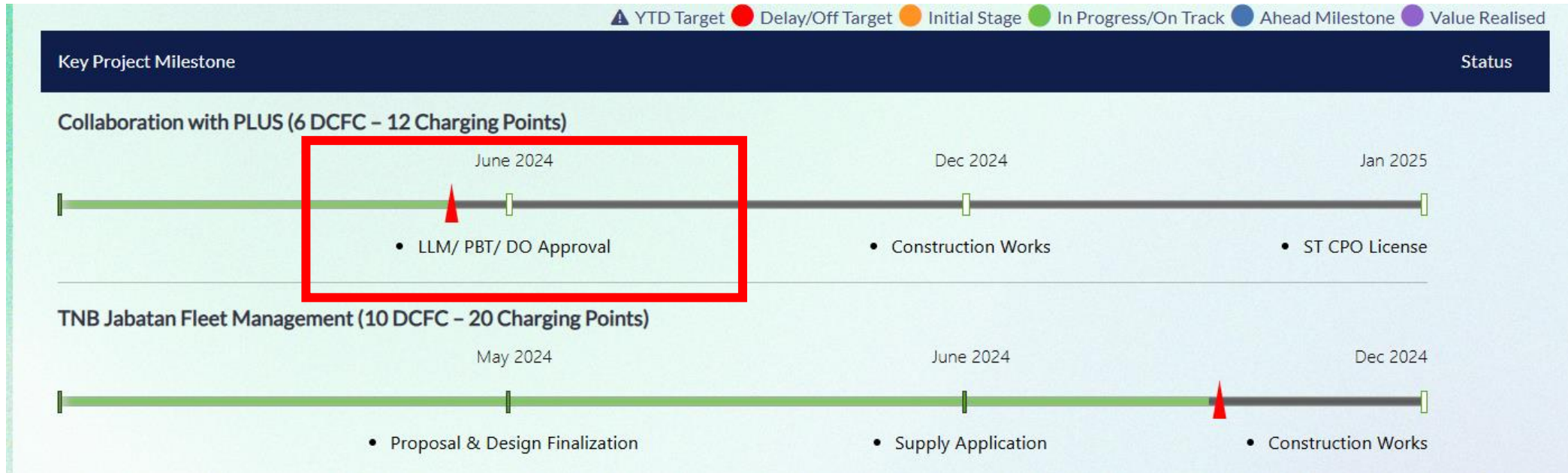
-All the item have already push to production server

1) Gantt Chart Hide Timeline



Hide timeline button function is already pushed to production server.

2) Dashboard Key Arrow Milestone




Initially, the key arrow milestone is manually adjusted. PM need to insert the percentage done for the month into the NETR dashboard and the key arrow milestone will move based on the percentage.

3) Editable Header for Report

View ReportGenerate ReportEdit Headers

Edit headers for "May 2024" report

TNB is entrusted to champion 3 NETR flagship projects and remains committed to support 6 other key energy transition projects



9 TNB NETR Flagship Projects	Champion	TNB as Partner	Additional Support that TNB can offer	TNB owner
1 Solar Park	TNB			TSE (NEE)
2 Hybrid Hydro-flooding Solar PV	TNB			GenCo
3 Co-Firing of Hydrogen & Ammonia	TNB			GenCO, CVD (SVD) & TNB
4 Residential Solar	Some Derby	✓		CSPARX
5 EV Charging Stations	MTI	✓		PMO EV
6 Kasek and Lang Lurah Carbon Capture Storage	Petronas	✓		GenCO, CVD (SVD) & TNB
7 Energy Efficiency and Conservation Act	NRECC	✓		SGMO - Retail
8 Integrated RE Zone	Khazanah	✓		SVD & TSE
9 Energy Storage System (ESS)	NRECC	✓		CVD (SVD), GRID, CVA & TNB
10 Enabler 1: Develop plan for accelerated investments of transmission and distribution				SGMO
11 Enabler 2: Develop TPA framework for sourcing of RE				SGMO

Header 1

TND is entrusted to champion 3 NETR flagship project

Most TNB NETR projects are on track in accelerating Malaysia's clean energy future

Flagship Projects	Current Opportunity / Initiative / Value Creation	2024 Target	YTD May 2024 Progress / Value Realised	Project Status
1. Optimised Solar Park	To unlock economic opportunities through accelerated deployment of utility scale solar to enable accelerated deployment of solar to enable increased and improved production of RE.	Notice to Proceed for additional 4 project sites	<ul style="list-style-type: none"> Site identification - 4 suitable sites have been identified (Johor, Perak, Kedah, Perlis) ESOP process - 144 completed ESOP - 122 completed ESOP - 22 CUs received from corporate with potential demand of 2.2 GW 	On Track
2. Hybrid Hydro-flooding Solar	To provide joint development initiative with state entities for development of floating solar to utilize abandoned mining areas and enhance water resource at reservoirs	Notice to Proceed for 100MW	<ul style="list-style-type: none"> Designs/feasibility studies for various sites 1 CU received with potential demand of 100MW 	On Track
3. Co-Firing of Hydrogen and Ammonia	To enable clean hydrogen production in Indonesia through green hydrogen and ammonia co-firing in collaboration with Petronas to decarbonise TMB generation plants	Installation of demo unit for hydrogen production	<ul style="list-style-type: none"> Identified and approached PPA and Conchaught Bridge Power Station as potential site PA studies endorsed by TNB-Petronas Joint Coordination Committee (JCC) Target to present to JCC in July 2024 	On Track

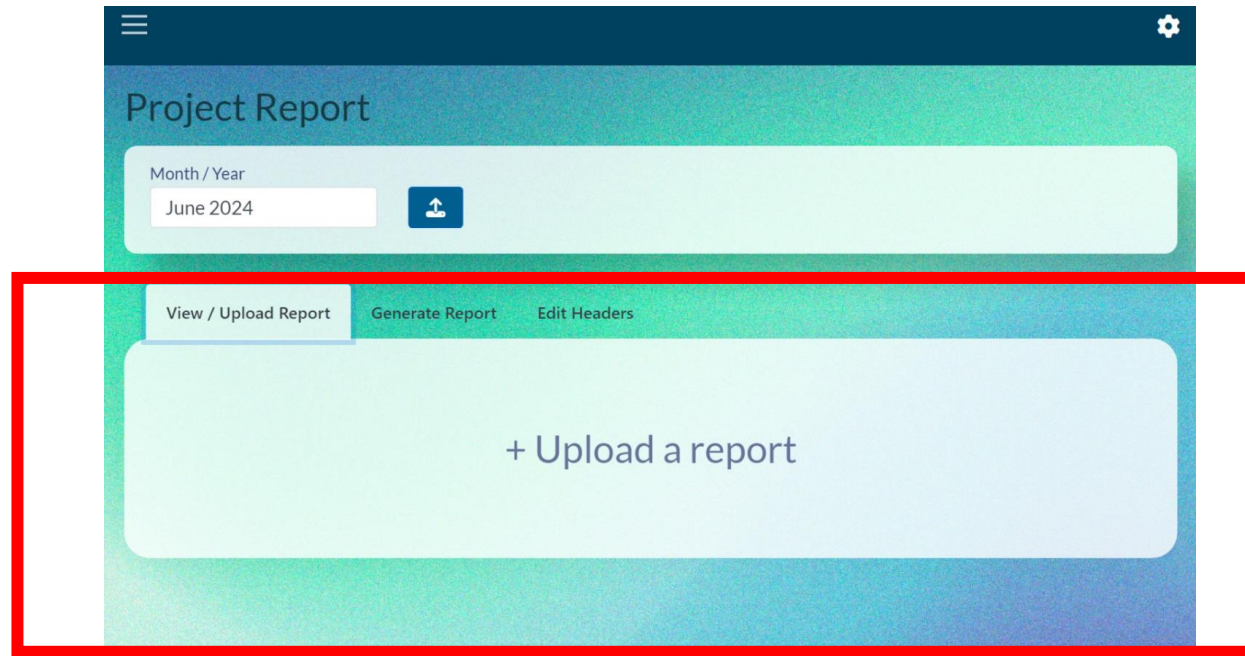
Header 2

The function have already moved to production server

Ver 1.0

6

4) Report Log



The report log function have already moved to production server

5)Project Milestone Month not in Sequence



Project milestone month not in sequence because currently the sequence is sort by Gantt chart order ID. Before this the sequence for this have been changed to follow:

1. Baseline start month
2. Baseline finish month
3. Gantt chart order ID

New enhancement:

To be changed to use Actual Finish month instead of Gant chart order ID. Already pushed to Production to be tested


NEW /ENHANCEMENT IN PLANNING

Project Details	Project overview > Total project cost - to divide the total project cost into three	Vendor	Coding	23 August	Enhancement		In Planning
Project Milestone	Automate data in current month note to follow the data insert by PM in the RM invested column, partner secured and non-regulated revenue column	Vendor	Coding	30 September	New		In Planning
Project Milestone	Key Project milestone status not reflect for all sub-project only the main project status is shown	Vendor	Coding	23 August	New		In Planning
NETR Performance Dashboard	Add one more box for performance dashboard called KPI dashboard	Vendor	Coding	23 August	New		In Planning
Project Report	Report overflow - Due to Microsoft PowerPoint limitation, the table cannot dynamically cut the data when overflow.	Vendor	Coding	23 August	Enhancement		In Planning
Project Report	Gap between table in powerpoint report generated is too big and consume a lot of space	Vendor	Coding	23 August	Enhancement		In Planning
Project Report	SVD request to have first draft to allow to download Power Point. It require change of work flow for project manager.	Vendor	Coding	26 September	New		In Planning
Executive Summary/ Performance Dashboard	Divide the MW achieved box into two. One for MW, one for BESS	Vendor	Coding	26 September	New		In Planning
Executive Summary/ Performance Dashboard	Additional new field under NETR Performance dashboard boxes	Vendor	Coding	26 September	New		In Planning

1)Project overview > Total project cost

Project overview dashboard

The user wants this section to appear on a separate row when they press enter.
Currently, in the editor view, the data can be divided into rows by pressing the ENTER button,
but this change is not reflected in the dashboard view or in the generated reports.

A. Project Overview	
Project Icon	
No	3
Project Description	Green hydrogen and ammonia co-firing in collaboration with PETRONAS to decarbonise TNB generation plants. TNB to play in green hydrogen value chain for the green electron supply in hydrogen production and hydrogen use in co-firing, green mobility, local industries as well as export.
Project Overview	TNB to play in green hydrogen value chain for the green electron supply in hydrogen production and hydrogen use in co-firing, green mobility, local industries as well as export
Total Project Cost & Investment	Projected JFS cost: RM 5mn Projected H2 demo unit project cost: RM 5mn per site Projected investment project Cost: RM 1-2bn (without BESS), RM 3-4bn (with BESS)
Internal & External Partners	<ul style="list-style-type: none">• Petronas• Gentari• Linde Malaysia• SIEMENS• IHI Corporation



Projected JFS cost: RM 5mn
Projected H2 demo unit project cost:
RM 5mn

2)Automate data in current month for RM Invested, Partners Secured and Non-Regulated Revenue

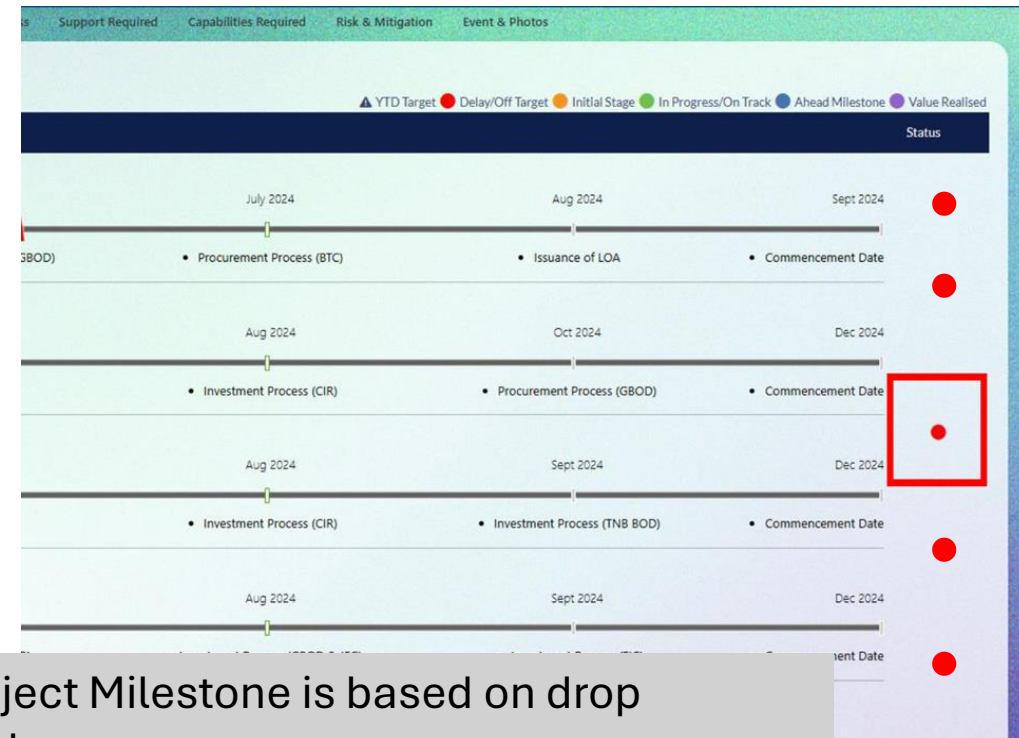
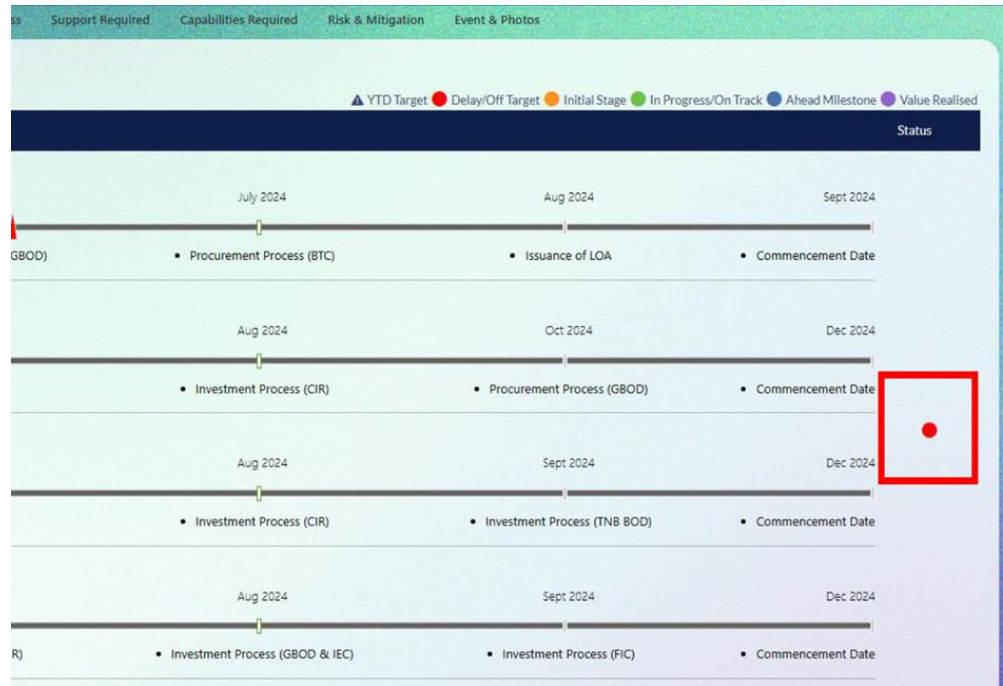
Current Month Note	End of Year Note	End of Project Note	MW Achieved	RM Invested	Non Regulated Revenue (kwh) (RM)	Partners Secured	Corp Customer Secured	Action
RM Committed: ~RM 40mn TNB Electron Customers: ~5015 Non-regulated revenue: ~RM474k	66 DC points installed	• 134 DC charge points installed ~10000		RM36,000,000.00	RM378,000.00	0	4593	Edit Delete

Automatically update

Currently RM Invested, Partners Secured, Non-Regulated Revenue in NETR Performance Dashboard Boxes take from total of RM Invested, Partners Secured and Non-Regulated Revenue (kwh) (RM) in Progress Detail tab.

User request for Current Month Note (which is free text) to be automate with RM Invested, Partners Secured and Non-Regulated fields Revenue (kwh) (RM).

3)Key project milestone status for sub-project

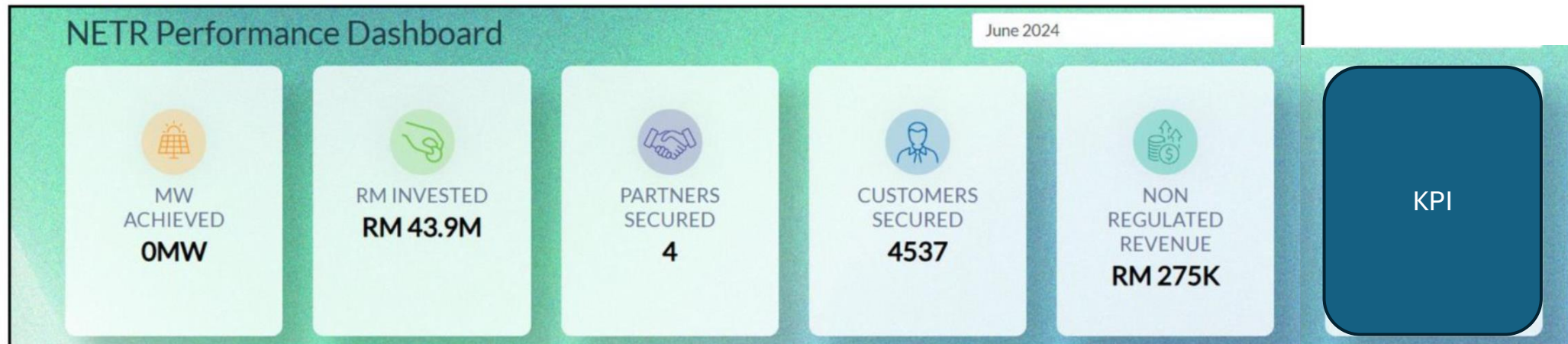
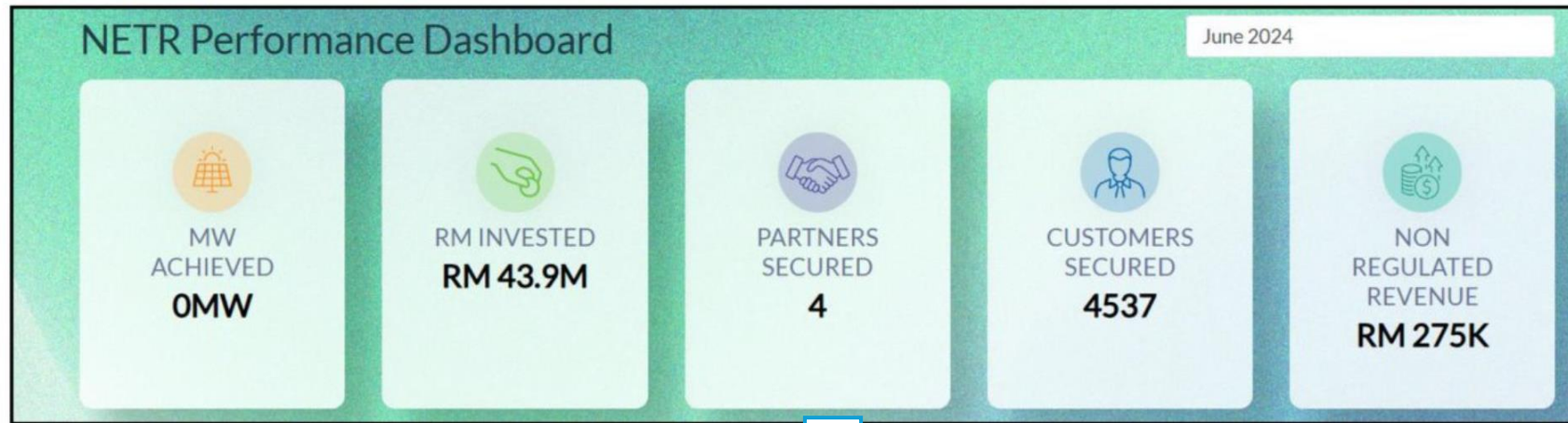


Situation: Currently traffic light for overall project in Key Project Milestone is based on drop down of Project Status drop down menu in Key Milestone tab.

Enhancement: In this enhancement, traffic light to take from Health Status of Project in timeline but still allow user to change the Health Status manually to choose Orange (Initial Stage), Purple (Value Realised)

4) Performance Dashboard – KPI Box

- User requests to add an additional box labelled "KPI," bringing the total number of boxes on the NETR performance dashboard to six.
- The formula to calculate the KPI is: $(\text{Actual Percentage} / \text{YTD Percentage}) * 100$.
- The values displayed on the performance dashboard will be derived from the total KPIs for Projects 1-6, which include Solar Park, Hybrid Hydro, Co-firing Hydrogen, Residential Solar, EV Charging Stations, and Carbon Capture and Storage.



5)Report Overflow from PowerPoint

- The table cannot dynamically adjust the data if the content has already overflowed in PowerPoint.
- User request for the content to be adjusted automatically to other page if its already exceed the slide limit.

JFS TNB-Petronas <ul style="list-style-type: none">First minimum viable product (MVP)Identification of levelized cost of electricity (LCOE), levelized cost of hydrogen (LCOH), levelized cost of electrons and hydrogen storage (LCOS) and H2 sales price	JFS TNB-Petronas <ul style="list-style-type: none">Joint Feasibility Study (JFS) endorsed by TNB-Petronas Joint Coordination Committee (JSC). Next to present to TNB SETC in July 2024 for project closure.Outcome of JFS:<ul style="list-style-type: none">Green hydrogen production in P. Malaysia ranges from USD8.18/KG - USD12.35/KG. this is way above the competitive LCOH of hydrogen of USD2/kg and green hydrogen of USD4/kg.The lowest LCOH (USD8.17/kg) is based on green power combination of grid power+ REC, however, this may limit the demand side/offtakers who may prefer hourly matching hydrogen production. <p>Potential venture in Petronas Green Hydrogen Production for E-methanol</p> <ul style="list-style-type: none">First coordination meeting on 7 May 2024. Obtained further insight into the project.In the latest engagement, Petronas updated that the immediate demand for the green hydrogen is for e-methanol. In terms of SAF, the demand for E-SAF is not significant at the moment. <p>TNB-Siemens MOU</p> <ul style="list-style-type: none">The MOU leads to a feasibility study on exploring innovative solutions and technologies to achieve affordable hydrogen production costs in Malaysia.Track 1, 2, 3 consist of conceptual design for modular RE park completed.Track 5: Conceptual H Class retrofit / modification in Prai, potential tech add ons (minimal), H2 quantity, space optimization including H2 supply sub system and electrolyser completed. <p>Hydrogen Demo Unit by TNBR</p> <ul style="list-style-type: none">TNBR has awarded GSPARX for the installation of 500kWp rooftop solar as the RE source for the green hydrogen production.	<p>Overcoming risks of investment in hydrogen projects, which include, but not limited to:</p> <ul style="list-style-type: none">Understanding customers' willingness to pay premium for green hydrogen and its derivativesThe techno-economic viability for 24/7 renewable energy dedicated for green hydrogen productionUnderstanding realistic demand trajectory for green hydrogen for local and international marketsImpact towards levelized electricity cost for hydrogen/ammonia co-firing <p>Accelerated competency development for TNB personnel on technical and financial aspects across hydrogen value chain</p>	JFS TNB-Petronas <ul style="list-style-type: none">To present to SETC for project closure.TNB-Petronas to continue policy advocacy for green hydrogen production <p>Potential venture in Petronas Green Hydrogen Production for E-methanol</p> <ul style="list-style-type: none">Petronas to explore demand from MAERSK for e-methanolTNB to discuss on potential JV with Petronas <p>TNB-Siemens MOU</p> <ul style="list-style-type: none">To conclude technical and commercial due diligence via factory and developer visits. <p>Hydrogen Demo Unit by TNBR</p> <ul style="list-style-type: none">To commence bidding process for the green hydrogen production facility.
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Page 1st

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- User request for the content to be adjusted automatically to other page if its already exceed the slide limit.

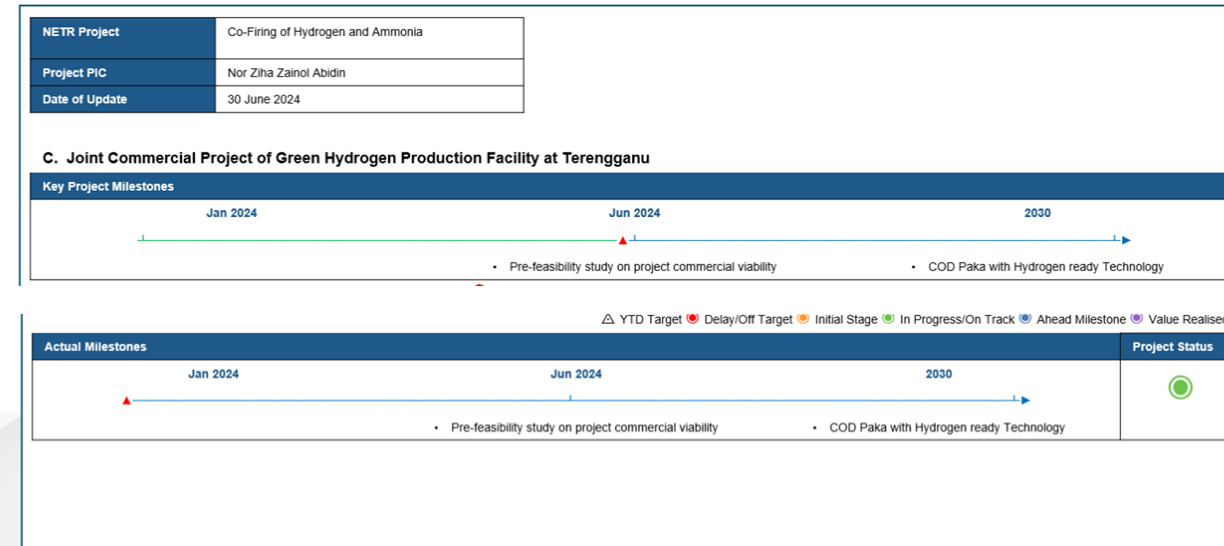
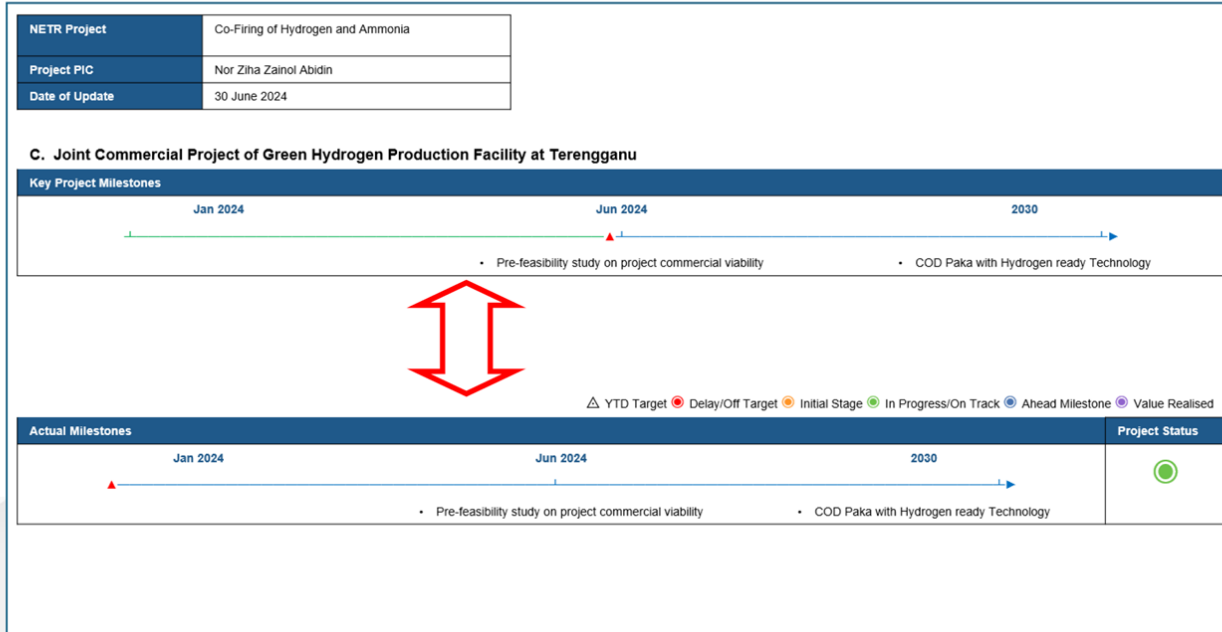
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Page 2nd

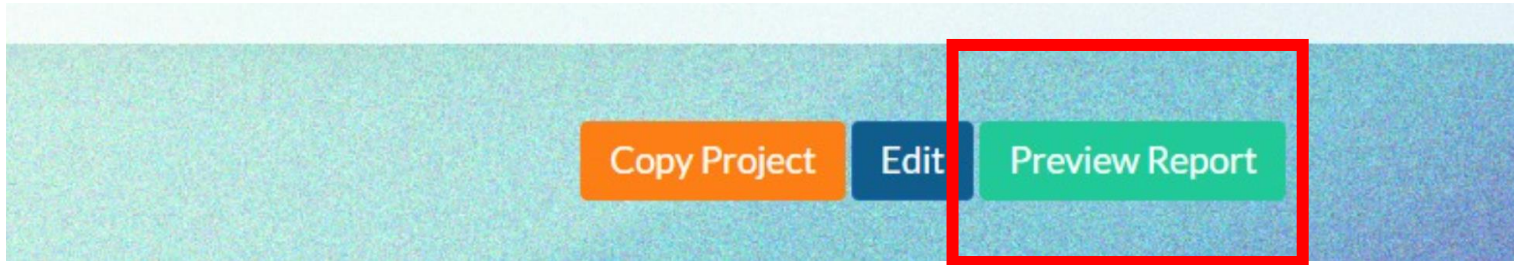
	<p>technologies to achieve affordable hydrogen production costs in Malaysia.</p> <ul style="list-style-type: none">Track 1, 2, 3 consist of conceptual design for modular RE park completed.Track 5: Conceptual H Class retrofit / modification in Prai, potential tech add ons (minimal), H2 quantity, space optimization including H2 supply sub system and electrolyser completed. <p>Hydrogen Demo Unit by TNBR</p> <ul style="list-style-type: none">TNBR has awarded GSPARX for the installation of 500kWp rooftop solar as the RE source for the green hydrogen production.		
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6)Gap between table for report

- The table displayed in the PowerPoint currently has a pre-determined position along the Y-axis. This makes the table's position rigid, resulting in a large gap and excessive space usage when the content is minimal.



7) First Draft of Report for PM



Situation: Currently, PM can only view report after report has been endorsed which is after

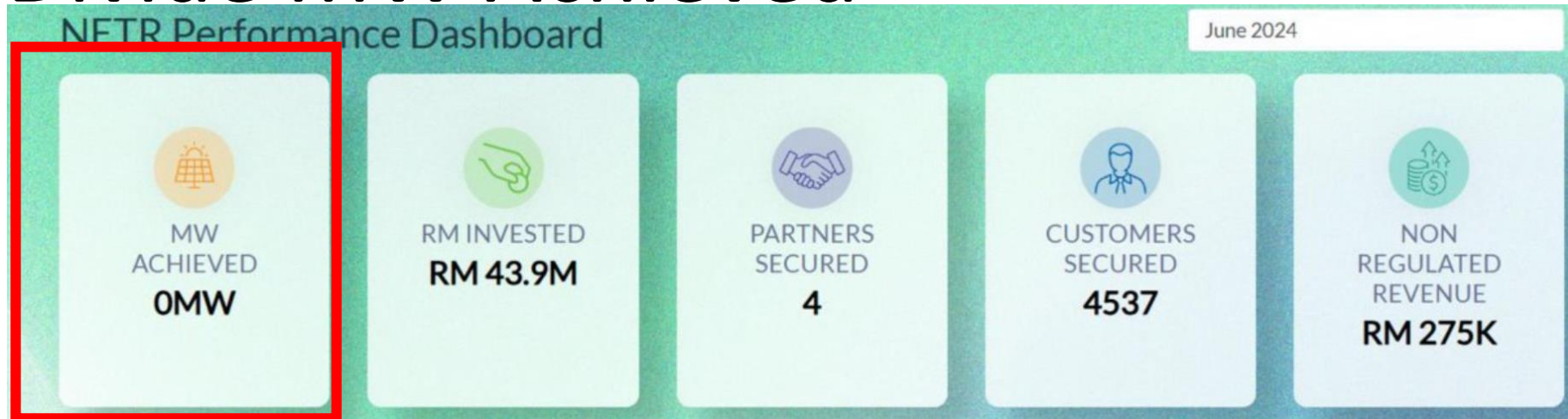
Submit. Preview Report will only be displayed in Endorsed.

Enhancement:

To enable "Preview Report" in draft mode instead of after submit only and endorsed which is

available for both PM & SVD.

8) Divide MW Achieved



To divide MW Achieved box into two and add BESS box.
New form and new database field is required for user to enter this data in Key Milestone



9) Make three separate field for YTD Status, Challenge and Next Steps

YTD FY2024 Progress & Key Highlights

YTD Status: JFS studies endorsed by TNB-Petronas Joint Coordination Committee (JSC). Target to present to SETC in August 2024

Challenges: Uncertainty on economic viability for carbon capture technology

Next Steps:

1. To commence Project Dragon
2. To continue policy advocacy on CCUS



YTD Status: JFS studies endorsed by TNB-Petronas Joint Coordination Committee (JSC). Target to present to SETC in August 2024

Challenges: Uncertainty on economic viability for carbon capture technology

Next Steps:

1. To commence Project Dragon
2. To continue policy advocacy on CCUS

Situation:

Currently YTD FY2024 Progress and Key Highlights is using HTML box for data entry. But this caused inconsistency in formatting and affecting the generated report produce.

Enhancement:

User request to separate into three field instead of using one HTML box.

10) Additional spacing in report generated after user copy and paste into the dashboard

2024 Target	YTD Progress	Challenges	Next Steps
JFS TNB-Petronas <ul style="list-style-type: none"> First minimum viable product (MVP) Identification of levelized cost of electricity (LCOE), levelized cost of hydrogen (LCOH), levelized cost of electrons and hydrogen storage (LCOS) and H2 sales price 	Potential JV with Petronas on Kenyir HHFS for Green Hydrogen Production <ul style="list-style-type: none"> A fast-track project for an end-to-end JV in green hydrogen production with RE source from Kenyir floating solar TNB is currently developing 2 blocks HHFS at Kenyir which will be ready by earliest 2026, and of which one block (500MW) is intended for Kenyir Green H2 Hub. Currently TNB is at the tendering stage for EPCC. The green electrons from Kenyir is open for off-take, including to Petronas & Data Centers Briefing on project updates held for PETRA (22 Aug 2024), KE (5 Sept 2024), MOP MNO (5 Sept 2024) and YAB PM (10 Sept 2024) TNB and PETRONAS has initiated head of Agreement discussion and target to finalized by week 3 Sept 2024 TNB-Siemens MOU <ul style="list-style-type: none"> The MOU leads to a study on exploring innovative solutions and technologies to achieve affordable hydrogen production costs in Malaysia Track 1, 2, 3 consist of conceptual design for modular RE park completed Track 5: Conceptual H₂ plant retrofit / modification in Prai, power plant add on (minimal), H₂ purity, space optimization including H₂ sub system and electrolyser completed No further action Hydrogen Demo Unit by TNBR <ul style="list-style-type: none"> GISPARX site modification on 23 Sept 2024. Expected completion date for Solar + BESS: Mid December 2024 Tender for hydrogen - closed and 16 companies participated. Tender evaluation 	<p>Overcoming risks of investment in hydrogen projects, which include, but not limited to:</p> <ul style="list-style-type: none"> Understanding customers' willingness to pay premium for green hydrogen and its derivatives The techno-economic viability for 24/7 renewable energy dedicated for green hydrogen production Understanding realistic demand trajectory for green hydrogen for local and international markets Impact towards levelized electricity cost for hydrogen/ammonia co-firing <p>Accelerated competency development for TNB personnel on technical and financial aspects across hydrogen value chain</p>	Potential JV with Petronas on Kenyir HHFS for Green Hydrogen Production <p>Target to finalized HOA by week 3 Sept 2024</p> TNB-Siemens MOU <ul style="list-style-type: none"> To conclude technical and commercial due diligence via factory and developer visits Hydrogen Demo Unit by TNBR <ul style="list-style-type: none"> To present at TNBR Board Tender on 30 Sept 2024



Situation: There a hidden space in report generated after user copy and paste the content into the system.

Enhancement: - Remove the hidden space or spacing in the report generated after user copy and paste their content into the dashboard.

NETR Project	Co-Firing of Hydrogen and Ammonia
Project PIC	Nor Zihfa Zainol Abidin
Date of Update	30 June 2024

2024 Target	YTD Progress	Challenges	Next Steps
JFS TNB-Petronas <ul style="list-style-type: none"> First minimum viable product (MVP) Identification of levelized cost of electricity (LCOE), levelized cost of hydrogen (LCOH), levelized cost of electrons and hydrogen storage (LCOS) and H2 sales price 	JFS TNB-Petronas <ul style="list-style-type: none"> To present the outcome of JFS in SETC August 2024 for project closure. Potential venture in Petronas Green Hydrogen Production for E-methanol (with Petronas Gas) In the latest meeting with Petronas on 5 July 2024, Petronas informed that MAERSK has a stringent requirement in terms of the criteria of green energy that they can accept which is only solar and wind and no hydro. But EU has set a different RE requirement. Next step is for PETRONAS to negotiate with MAERSK if the green energy available in Malaysia and REC are acceptable to them. In terms of off-take of green H₂, now the demand is for the Green Methanol. Worldwide, MAERSK has already ordered 6 vessels with dual fuel: methanol powered- engine. However, MAERSK has already secured part of its green methanol from China. Hence, less pressure to secure from Malaysia In terms of SAF, regulation on the aviation industry requires for SAF, not e-SAF (from green hydrogen), and also based on the volume needed, it doesn't make commercial sense to produce e-SAF. Moving forward, PETRONAS plan to bring this issue up to MTN to highlight to MOT on this challenge for government assistance. TNB may want to collaborate on this matter to bring down the cost of green hydrogen production to competitive level. 	<p>Overcoming risks of investment in hydrogen projects, which include, but not limited to:</p> <ul style="list-style-type: none"> Understanding customers' willingness to pay premium for green hydrogen and its derivatives The techno-economic viability for 24/7 renewable energy dedicated for green hydrogen production Understanding realistic demand trajectory for green hydrogen for local and international markets Impact towards levelized electricity cost for hydrogen/ammonia co-firing <p>Accelerated competency development for TNB personnel on technical and financial aspects across hydrogen value chain</p>	JFS TNB-Petronas <ul style="list-style-type: none"> To present to SETC in August 2024 for project closure TNB-Petronas to continue policy advocacy for green hydrogen production To work together with PETRONAS for D-Carnation and Gentari for Project Kronos Potential venture in Petronas Green Hydrogen Production for E-methanol <ul style="list-style-type: none"> Petronas to present to MTN for (MOT) government's role to ensure competitiveness of green hydrogen production in Malaysia TNB to discuss on potential JV with Petronas TNB-Siemens MOU <ul style="list-style-type: none"> To conclude technical and commercial due diligence via factory and developer visits Hydrogen Demo Unit by TNBR <ul style="list-style-type: none"> To commence bidding process for the green hydrogen production facility

11) Add new field to display targeted below the the dashboard box



Situation: Currently there are no field to add and field to display the targeted field in the dashboard box.

Enhancement: Add field for data entry for targeted value and display on the dashboard and report generated

12)Add column Division and Name in action log

Overview	Key Outcome	Key Milestone	YTD Progress	Support Required	Capabilities Required	Risk & Mitigation	Event & Photos	Action Logs
Action Logs								
Action	Action By	Remarks					Action Date	
Submit	10094163	Pls submit the project update to Unit Pantau Madani lead by Encik Mohd Khalid bin Mohamed Latiff.					16/07/2024 9:33	
Return	10082399	To update the gant chart based on separate project. Thanks					16/07/2024 14:16	
Submit	10094163	Remove all the key milestone and update the KRI Gantt Chart as discussed via phone conversation with Pn. Nor Faizah on 16/7/2024.					16/07/2024 17:18	
Return	10082399	To update the funnel for each projects					18/07/2024 9:32	
Submit	10094163	Updated on the project funnel.					18/07/2024 16:15	
Publish	10082399						22/07/2024 10:55	
Update	10082985						22/07/2024 12:10	
Update	10082985						22/07/2024 12:12	

Situation: Currently in action logs, there are Action, Action By, Remarks and Action Date column.

Enhancement: 1. To add two new column called **Division** and **Name** in the action log.

2. To rename button

i. **Save -> Submit**

ii. **Submit -> Endorsed**

Moving Forward

- We will set FAT (Final Acceptance Test) session to verify the failed item on the previous UAT session.

Thank you