

# Meeting 10

<b>Date</b>	Tuesday, 16 March 2021
<b>Attendees</b>	Dr Ali Yetisen (AY), Marie Jones (MJ), Mathusan Kandiah (MK), Zong Lee (ZL), Yuxin Liu (YL), Mustafa Naser (MN), Helen Ogbobi (HO), Wei Ooi (WO), Andreas Richardson (AR), Stephen Tan (SN), Sathurthini Thuraiaratnam (ST), Mingchuan Zheng (MZ), Antonia Feilden (AF), Abdullah Ahmed (AA)
<b>Apologies</b>	N/A
<b>Chair</b>	Wei Ooi (WO)
<b>Secretary</b>	Helen Ogbobi (HO)

## Minutes

Item	Discussion
<b>General</b>	<p>WO: A lot of progress and finalisation for main report – this will be summarised by subsections.</p> <p>MJ: identified sections that will be in executive summary</p> <p>AK: specialist sections will be marked by experts. Antonia, Abdullah and I will be marking executive summary</p> <p>WO: each time will read two different sections of the report and we have a deadline of Friday at 11am</p>
<b>Feedback</b>	<p>AF: generally speaking, with paragraphs, it is easy for the reader to get lost – ensure that you clarify your points at the start of each section (for all sections)</p>
<b>Synthesis</b>	<p>YL: PFD and supporting documents, need to edit PFD so that it meets the specific requirements. Also be aware of what stage everyone is at</p>
<b>Reactor</b>	<p>AR: sensitivity analysis continued and have finalised reactor shape (example shown on sizing of the inner cooling system). Sensitivity needs finalisation and then will complete write-up</p> <p>WO: finalising the drawings for mech design. On track, a little bit of speeding up needed</p> <p>MJ: is the multi-optimisation programme for trade-off between safety and performance still running?</p> <p>AR Software error means it needs to be run again from the start</p> <p>AK: Are you calculating the mechanical strength, stresses and pressure?</p> <p>WO: currently using standards from 3<sup>rd</sup> year mech design</p>
<b>Separations</b>	<p>MZ: write up for theories and modelling for wash column have been completed. Remaining is write up for physical design and conclusions. Mechanical designs are from BS standards</p> <p>AR: are the flanges a feature of our flowrates? Would it not bend?</p>

	<p>Ming: Generally, there would be a pore structure for bending but are not designing the pore structure. Wash column itself is small. Crystalliser is much larger than the wash column</p>
<b>Safety</b>	<p>HO: Finalised waste treatment – we have swapped wet air oxidation for adsorption with activated carbon. This was due to safety concerns with methanol. Separating waste streams into two storage units, each diluting with water. Nitric acid stream will undergo neutralisation. Plant layout also finalised. Remaining actions are table formatting, values for indirect greenhouse gases and final read through report</p> <p>AF: Need to consider material for neutralisation tank, ensure temperature is suitable – maybe use stainless steel. Consider mentioning effects of natural disaster and air monitors for NOx</p> <p>HO: Will consider adding these, just depending on time and space as we are already over the limit</p>
<b>Control</b>	<p>MJ: Finalized the safety alarms, emergency trip actions, start-up and shut-down decisions. Main task remaining is to finalise the P&amp;ID section.</p>
<b>Business</b>	<p>MN: Finalized business timeline; begin in 2021, getting registered and investors, finalising design. 2023: sales and revenue. Plan to increase capacity every 5 years by 10 days a year to meet market demand. 2043: plant decommission, 20-year lifetime</p> <p>YL: All equipment costs received so we can finalise cash flow sheets. Finishing sensitivity analysis today and finish write up by tomorrow.</p> <p>AK: How can you pay back the loan in 3 years and how much loan will you be receiving?</p> <p>YL: Loan is 19 million</p> <p>AK: You will reach profitability in 3.5 years and pay back loan? How much are you generating annually?</p> <p>YL: 13 million revenue per year from 2023</p> <p>MN: Our capex quite high as we are using expensive catalysts</p> <p>YL: Look at project payback, have a high debt-equity ratio and so equity payback is small</p> <p>MN: We have a quick payback period due to the high revenue of products and low operating costs due to small scale – very valuable products</p> <p>AK: normal long-term investment is about 10 years</p> <p>MN: loan will be paid back over 10 years, but initial investment will be returned in about 4 years</p> <p>AK: Where are investments coming from?</p>

MN: commercial banks within China, we are not issuing corporate bonds. Chinese banks open to giving loans to small businesses – we have a good chance of receiving the loan. Bank (local) will give us \$90 million, and shareholders will give \$60 million (global)

AK: Who are the shareholders?

MN: Foreign/local investors – will not be listed on private stock exchange

AK: Is it normal to ask for an investment directly or would you go through companies?

MN: Have to look into that, though it should be fine to approach as a standalone business

### Project timeline and presentation

WO: Every team is finishing their write-up, reactors have a little finalisation with modelling

AF: As a team, you need to know where everyone is and what sections are a priority.

AK: Who is handling latex?

A: everyone is using latex, we need to be on top of errors and spend time on Friday with tidying up

Who is coordinating activities between groups?

MJ: Myself and Stephan

AK: Is the outline ready

MJ: Yes

AF: look after each other, do your best with formatting and pro-reading. Formatting is a very important task – do not underestimate it

MJ: Can we have a mock presentation next week?

AK: arrange a mock for Monday afternoon at time suitable for the team. It is good to have some diversity in presentation.

AF: good to have a think about which software you will use for the presentation

MF: We will have to decide who is presenting.

### Actions

Description	Assignee	Due
Report writing	All	Next meeting

<b>Formatting of report</b>	AR, YL	11.00, 19 <sup>th</sup> Mar
<b>Presentation</b> decide who will be presenting	MJ, MN, HO	23 <sup>rd</sup> Mar
<b>Presentation</b> Complete presentation slides	All	21 <sup>st</sup> Mar

## Approval

Ali K. Yetisen  
Dr Ali Yetisen  
*Facilitator*

Wei Loon Ooi  
Wei Ooi  
*Chair*

*Helen Ogbobi*  
Helen Ogbobi  
*Secretary*

**Signature:**   
Wei Loon Ooi (Mar 16, 2021 16:23 GMT)  
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# FYD Team 8 facilitator meeting minutes - 16-03-2021

Final Audit Report

2021-03-16

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