



# Novozymes

## Transformation into Demand Driven MRP

SAPSA IMPULS Conference 2021

08-11-2021

# Welcome

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## Novozymes A/S



**Peter Christian Graae**  
*Head of supply chain service and  
process excellence*

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## Syncronic a Deloitte business



**Stefan Glar-Hammarsund**  
*Partner | DK Supply Chain Network &  
Operations*



# Agenda

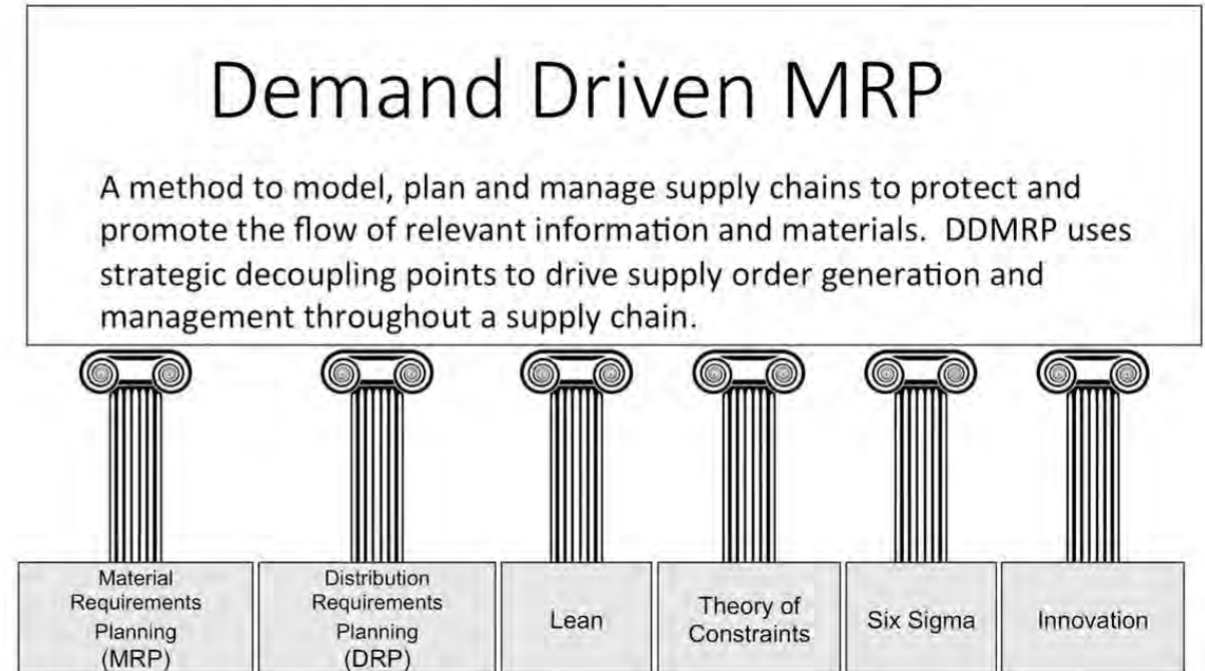
**What is Demand Driven MRP**

Novozymes DDMRP transformation

Q & A

# Demand Driven MRP (DDMRP) – The background

- MRP invented in the 1950s - still used
- MRP fueled by forecast – results in:
  - Chronic shortages
  - Excess inventories
  - High operational cost
  - Spreadsheet planning
- Demand Driven MRP:
  - To address MRP challenges – new concept
  - Defined in 2011 after 15 years of research
  - Promoted by the Demand Driven Institute
  - Mix of known concepts and new innovations



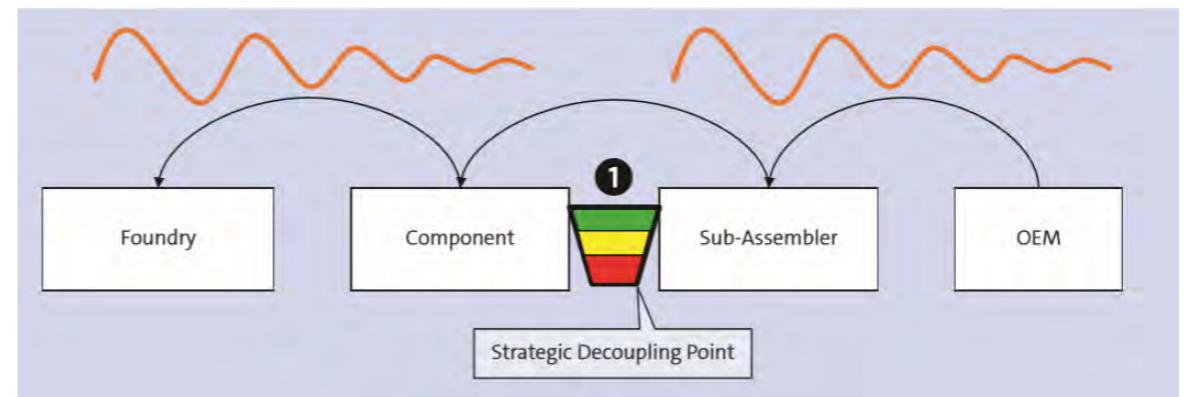
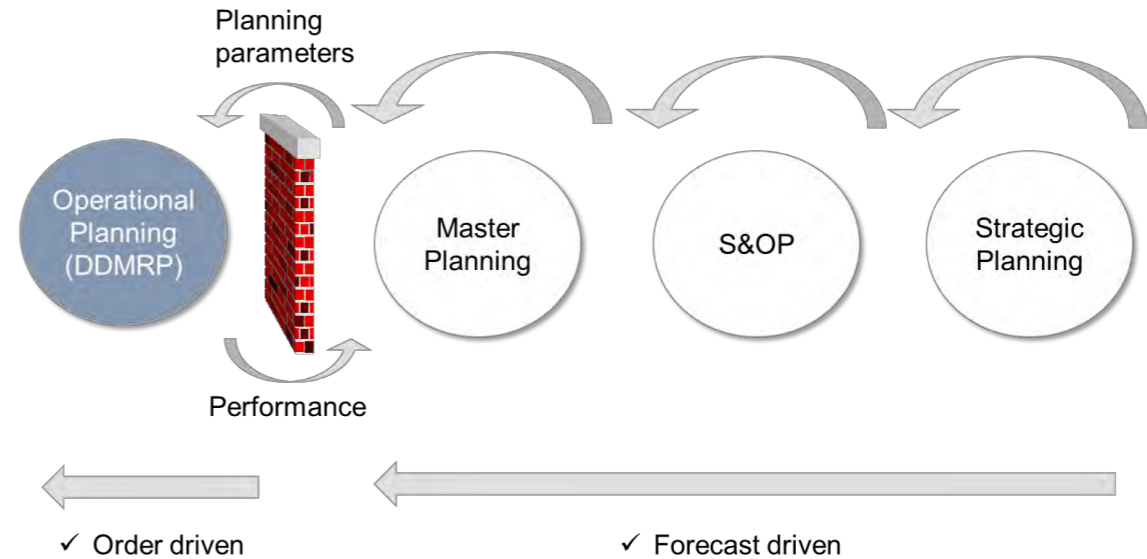
Demand  <sup>TM</sup>  
Driven  

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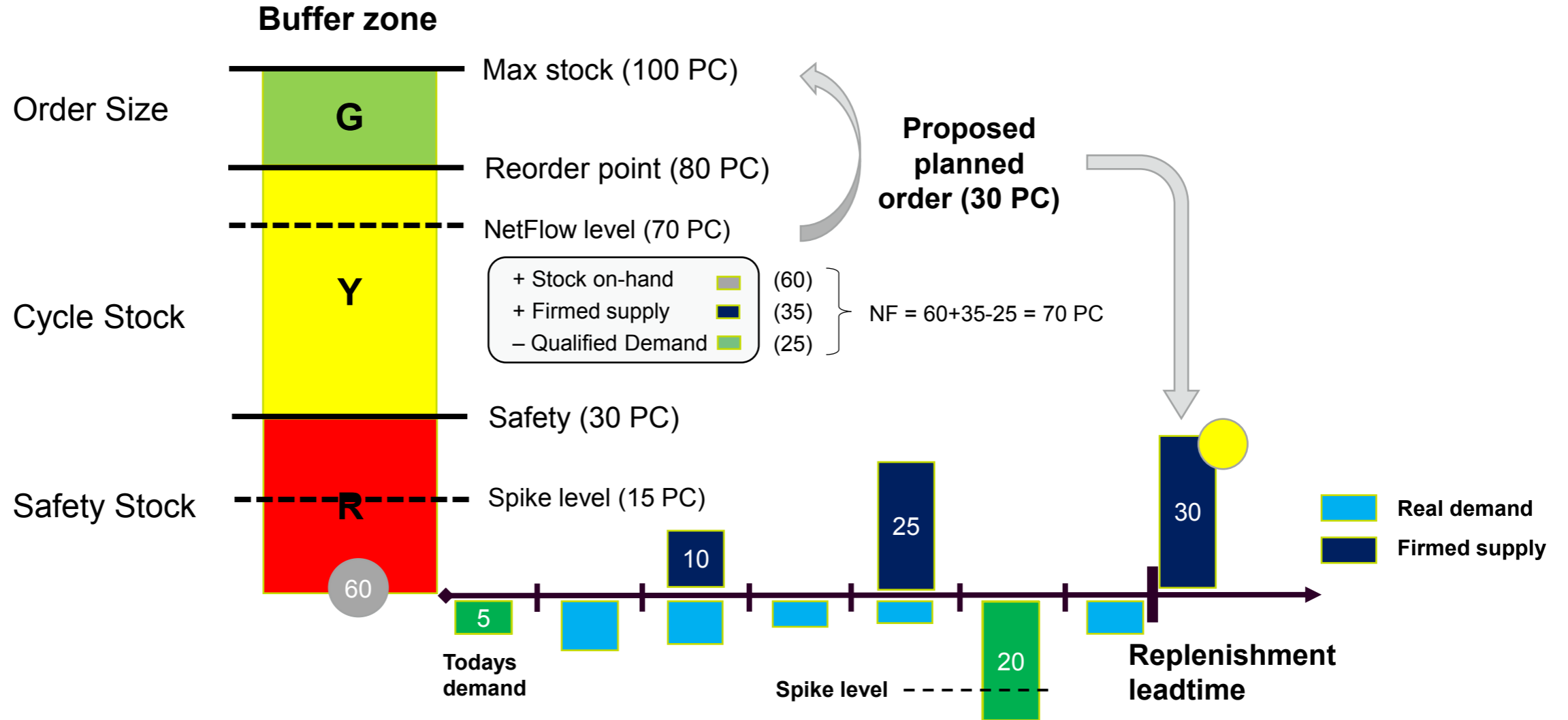
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# DDMRP basic principles

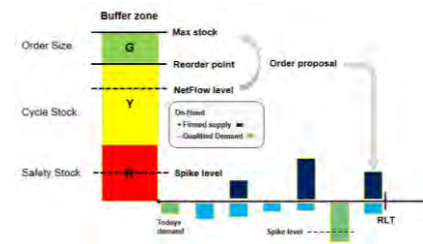
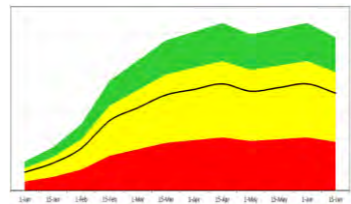
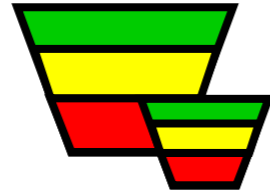
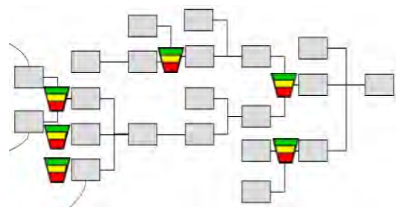
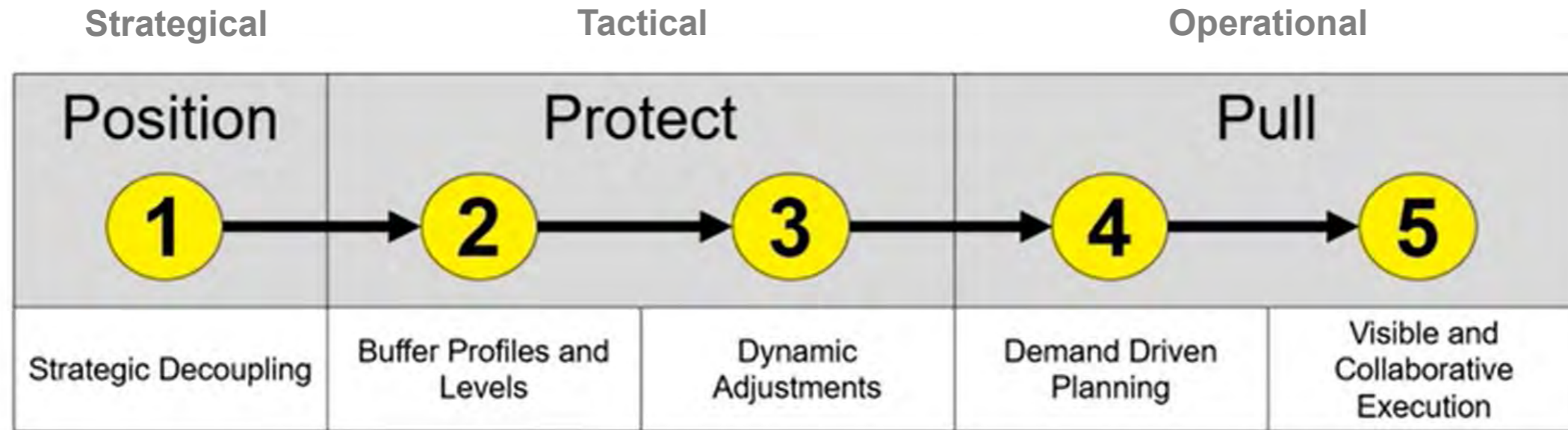
- Re-order point approach
  - Forecast used as re-order point
- Demand driven
  - Real demand used as signal to act
- Operational planning concept
  - Integrated with SOP through parameters
- Flow based planning
  - Considers availability in lead time
- Buffer zones removes bull-wip
  - Placed at de-coupling points
- Alert based planning
  - Buffer status drives priorities
- Intuitive planning solution
  - Roughly right better than precisely wrong



# Buffer zones & NetFlow calculation



# 5 steps in setting up and executing the DDMRP process



Order #	Due Date	Buffer Status
MO 645181	05/14	RED - 13.2%
MO 845172	05/13	RED - 36.2%
MO 831162	05/12	YELLOW 62.1%
MO 831145	05/12	YELLOW - 72.1%
MO 821158	05/12	YELLOW - 87.2%

# Benefits of DDMRP – Typical improvements

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## Inventory Reduction

Typical inventory reductions of 15-45% are achieved while improving customer service



## Improved Customer Service

Users consistently achieve 95-100% on time fill rate performance



## Lead Time Compression

Lead time reductions in excess of 80% have been achieved in several industry segments



## Reduced Total Supply Chain Cost

Costs for expedite activity and false signals are largely eliminated (rush freight, partial ships, cross ships, schedule break-ins)



## Easy and Intuitive

Planners see priorities instead of constantly fighting the conflicting messages of MRP



# Agenda

- What is Demand Driven MRP
- **Novozymes DDMRP transformation**
- Q & A

Rethink tomorrow

# DDMRP implementation at Novozymes

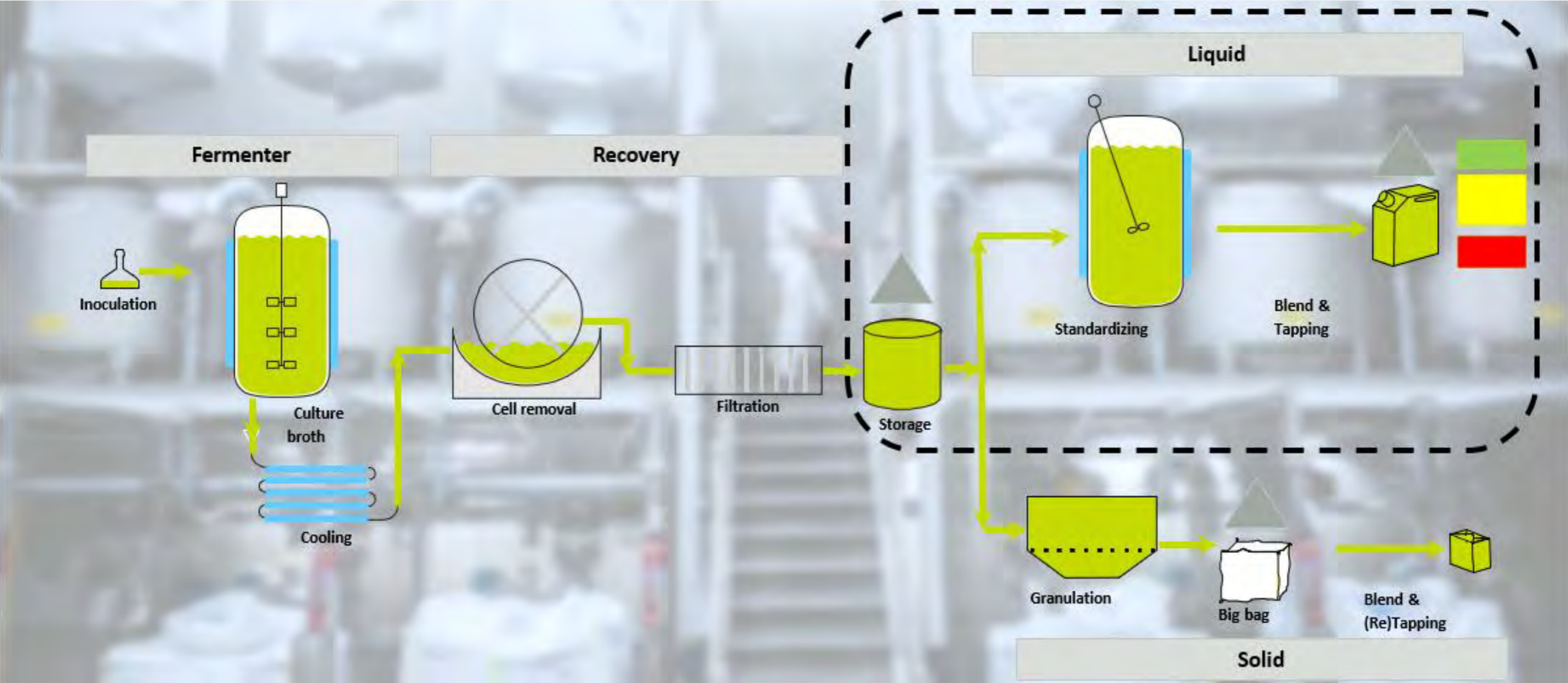
PCG (Peter Christian Graae)

08/11/2021



novozymes 

# Process overview





# Demand Driven Material Requirement Planning operating model



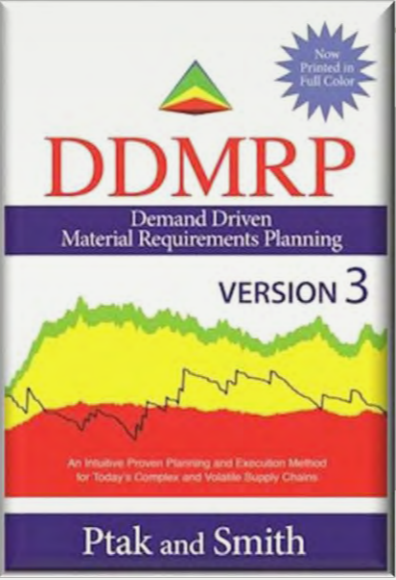
**Strategic decoupling Points**

The Demand Driven Operating Model uses **strategically placed decoupling points to compress lead times**, shorten planning horizons and **dampen demand and supply variability**.

STD Product	Priority	Netflow(%)
3315088-010	Alert	14
3825301-010	Alert	0
3515027-010	Alert	1
6125098-010	Create	6
1125012-010	Create	44
6125012-010	Create	58
3745010-010	Create	64
3585118-010	Create	69
6450002-010	Create	79
3515122-010	Create	86
1265592-010	OK	94
1245201-010	OK	88
3825337-010	OK	91

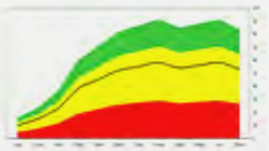
**Prioritization planning Based on real demand**

The Demand Driven Operating Model are enabling alert based planning which provide **an prioritization** when firming orders.



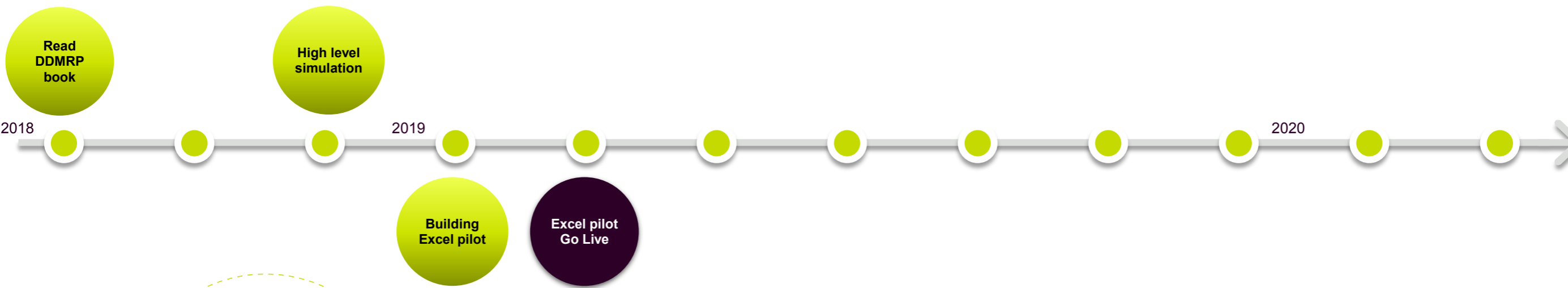
**Paces to actual demand**

The Demand Driven Operating Model **uses only actual demand** for supply order generation and not forecast as traditionally MRP. Going from **push to pull strategy**



**Dynamic inventory buffering**

The Demand Driven Operating Model protects its decoupling and control points through **dynamic stock, time and capacity buffers**



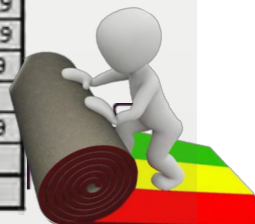
# Pilot :

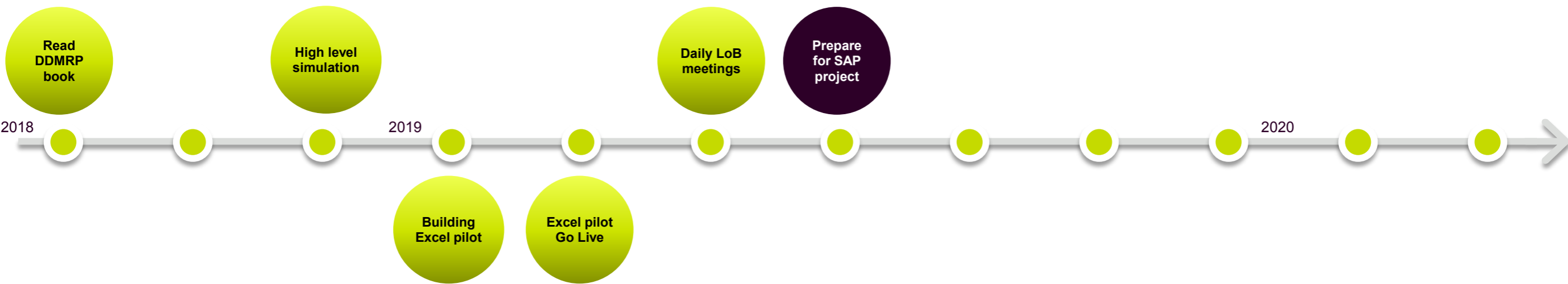
Easy to create a high level simulation which could visualize DDMRP impact

Excel pilot was created in 5 days

SDT planning report - - Savinase 16 L																	
STD	STD priority	FPP	Order Amount (top of Green)	Planning Priority	Net flow position	Fill-up top of Green	Production LT	Planning LT	Due Date	Backorder date	Total Demand	Split before topup	Fill-up over extra	Tapping proposal	Manuel Tapping proposal	Number of Lot(s)	Coverage
	88%	3.636E+09	0	299%	67000	0				6/16/2019	59150	31.1%	0				
		3.636E+09	0	475%	6000	0				7/28/2019	5259	0.0%	0				
		3.636E+09	0	88%	3800	525				4/19/2019	21656	25.1%	0				
		3.636E+09	0	192%	30775	-14753				5/19/2019	51895	43.9%	0				
3635969	Total production qty		0							4/19/2019				0	0	0	

SDT planning report - - Termamyl 120 L, Type L																	
STD	STD priority	FPP	Order Amount (top of Green)	Planning Priority	Net flow position	Fill-up top of Green	Production LT	Planning LT	Due Date	Backorder date	Total Demand	Split before topup	Fill-up over extra	Tapping proposal	Manuel Tapping proposal	Number of Lot(s)	Coverage
	64%	3.615E+09	28125	64%	50973	0				4/14/2019	276706	98.8%	45302	74400			5/13/2019
		3.615E+09	0	271%	93600	0				6/10/2019	147842	0.0%	0	0			6/10/2019
		3.615E+09	0	124%	7200	0				4/29/2019	1626	0.4%	190	1200			5/5/2019
		3.615E+09	0	MTO	7000						9000	0.0%	0	0			
		3.615E+09	0	231%	15630	0				5/30/2019	12065	0.8%	388	1200			6/4/2019
		3.615E+09	0	MTO	19200						48000	0.0%	0	0			
3615007	Total production qty		28125						4/9/2019	4/14/2019				76800	0	1	





# Steps :

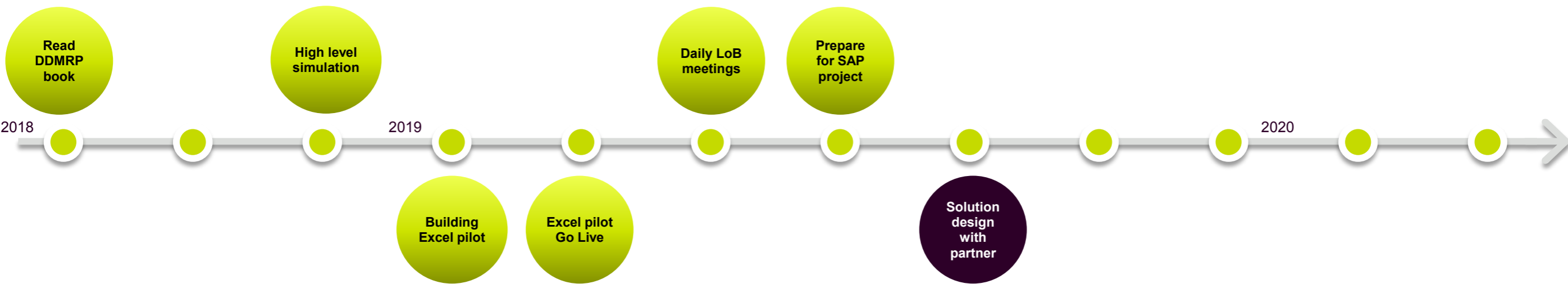
Clarify the APO roadmap with SAP DK

System architecture (IBP vs. APO)

Search market for existing solution

Partner selection (Deloitte/Syncronic)

Establish project plan and project organization

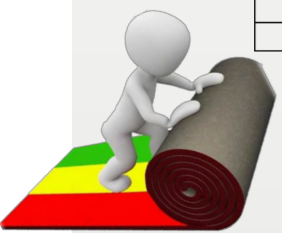


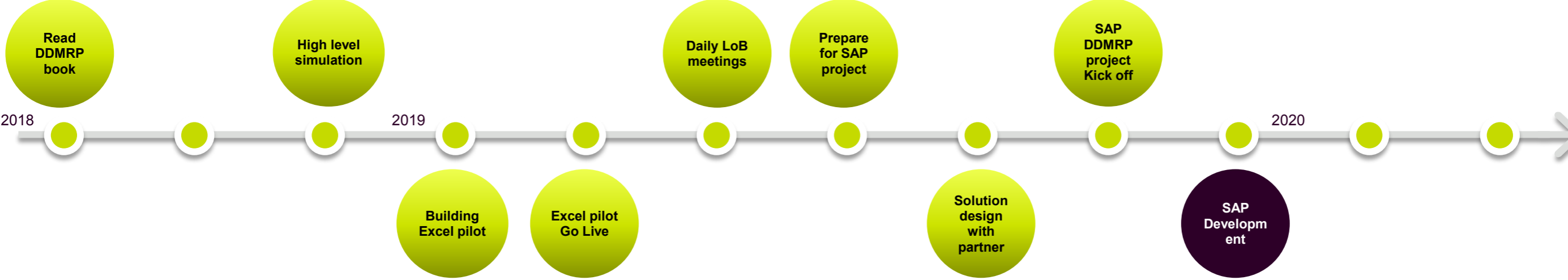
# Execution

Mock-up's in Excel was used as solution specification and designing new reports

DDMRP Cockpit

Firm flag	PPDS Pl. Order #	Material # (FPP)	DDMRP Priority	Net Flow level (%)	Pl.Order qty	Pl. Order Start date	DOH1 (stock)	Backorder date (stock)	DOH2 (stock + pipeline)	Backorder date (stock + pipeline)	DOH3 (NetFlow proposal)	Backorder date (NetFlow proposal)	Stock On-hand inventory	Qualified Demand	Open Supply	RTL	End of RTL	TOG	TOY	TOR	Comment
x	1240		Alert	25%	1000	15.09.2023	21	29-10-2019	23	31-10-2019	24	01-11-2019	2500	1300	4100	7	15-10-2019	3500	8000	10000	PO has been created by SQRS
x	1239		Re-order	45%	2000	15.09.2022	67	14-12-2019	45	22-11-2019	44	21-11-2019	2300	1100	3900	7	15-10-2019	3400	7900	9900	PO has been created by PCG
x	1237		Re-order	85%	2000	15.09.2020	54	01-12-2019	56	03-12-2019	45	22-11-2019	2100	900	3700	7	15-10-2019	3750	8250	10250	
	1238		OK	97%			65	12-12-2019	78	25-12-2019	46	23-11-2019				10	18-10-2019				
	1236		Over max	120%			60	07-12-2019	78	25-12-2019	46	23-11-2019				7	15-10-2019	0			
	1290		Over max	121%			80	27-12-2019	81	28-12-2019	44	21-11-2019				7	15-10-2019				





# Result

- 2 cockpits were created and a planning book
- User friendly and alert based planning in new APO reports
- Integrated it with available to promise check (ATP)

**DDMRP COCKPIT**

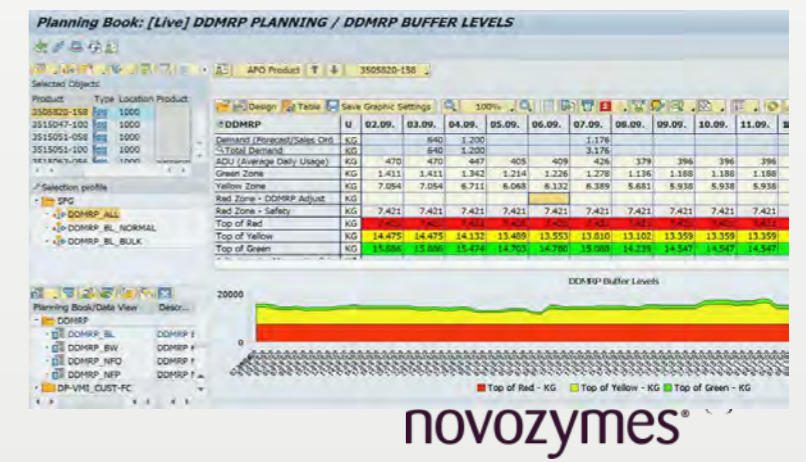
Annotations:

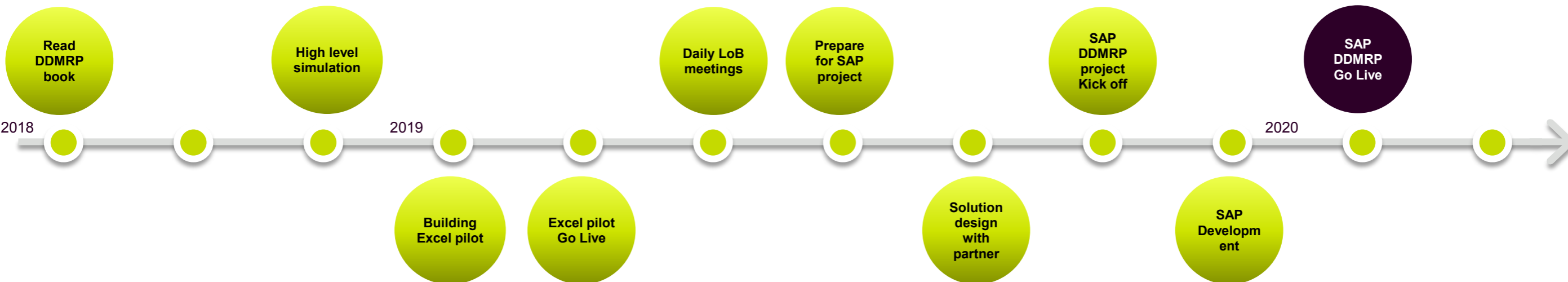
- Firming button
- List of my products
- DDMRP priority => Firm order when in Yellow/Red
- DDMRP "MRP" calculation = NetFlow
- DDMRP proposals for firming (placed on RLT)
- DDMRP buffer zone (re-order point level)

Pln	Firm Flag	Product	Description	Planning	Priority	NetFlow (%)	NetFlow Qty	Stock On Hand	Restricted Stock	Open Supply	Qualified Demand	Order Qty	Order Text	TOG	TOY	TOR
		Flavourzyme 500 MG K*H*N*F		60	Alert	29	1.440	1.680	0	0	240	6.000	DDMRP pl.order	5.018	4.582	2.402
		Novozym 27631*K*H*N*FG*A		60	Create	35	440	1.080	0	0	640	2000	DDMRP pl.order	1.269	1.111	320
		BAN 800 MG*K*H*N*FG - BIB2		60	Create	49	7.840	0	4.040	12.000	4.160	6000	DDMRP pl.order	15.886	14.475	7.421
		Novamyl Conc. BG US*K*H*N*		60	Create	61	470	960	0	0	490	2000	DDMRP pl.order	767	664	150
		Gluzyme Mono 10000BG*K*H*		60	Create	81	17.080	16.580	0	6.020	5.520	4000	DDMRP pl.order	21.130	18.817	7.249
		Lipopan Xtra BG*K*H*N*FG - B		60	Create	88	2.960	3.180	0	0	220	4000	DDMRP pl.order	3.363	2.988	1.114
		Shapeit Biscuit*K*H*N*FG - BI		60	Create	89	859	1.620	0	0	762	2000	DDMRP pl.order	969	874	397
		NovoCor ABG - BIB20KG - DK		60	OK	89	1.960	2.920	0	0	960	0		2.202	1.922	520
		Pentopan Mono BG CN*K*H*N		32	OK	100	3.960	8.778	0	0	4.818	0		0	0	0
		Novozym 11039*K*H*N*FG - B		32	OK	100	1.040	1.040	0	0	0	0		0	0	0
		Noopazyme White*K*H*N*FG -		32	OK	100	0	400	0	0	400	0		0	0	0
		Novozym 27755*K*H*N*FG - B		60	OK	100	0	0	0	0	0	0		0	0	0
		Alpha Amylase SC 400 MG T.*		32	OK	100	180	180	0	0	0	0		0	0	0
		Novamyl Pro 80 BG*K*H*N*FG		60	Over max.	109	7.400	8.200	0	0	800	0		6.819	6.232	3.295
		Gluzyme Mono 2X BG*K*H*N*F		60	Over max.	109	3.531	3.800	0	0	269	0		3.232	2.838	871
		Novozym 27471*K*H*N*FG - B		60	Over max.	111	690	300	0	680	290	0		624	524	20
		Novozym 27417*K*H*N*FG*A		60	Over max.	111	1.180	1.340	0	0	160	0		1.063	993	644
		CELLULAST BG*K*H*N*FG -		60	Over max.	112	3.960	4.120	0	0	160	0		3.537	3.222	1.644
		Funcamyl Ultra WF G*K*H*N*F		60	Over max.	118	37.280	31.440	0	12.000	6.160	0		31.598	28.197	11.192

**Tapping Split Report: Main screen**

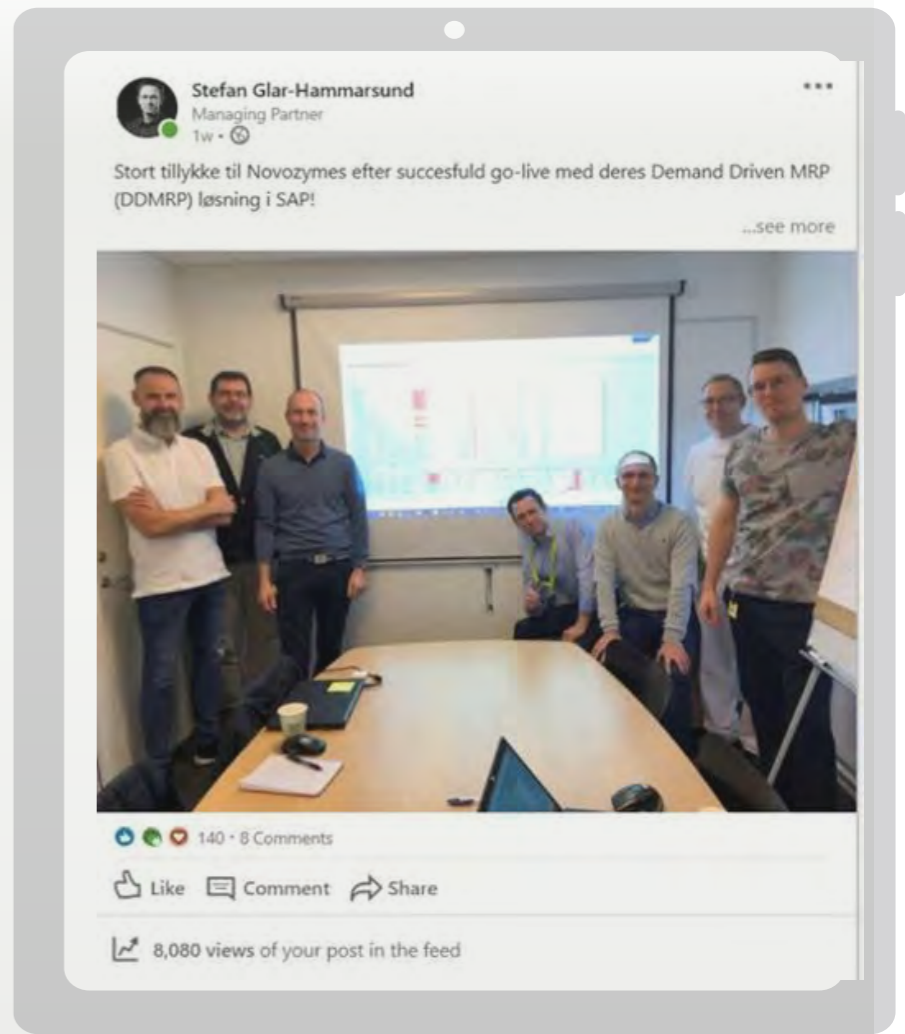
STD Product	Description	Priority	Proposal	Lotsize	Log	Stock o.	Open s.	RLT Date	GR Time	Order Text	Memo Pr.
tearzyme Plus*K*H*N*FG - B		Alert	11.200	11.200	0	11.190	16.05.20	3,00			112
iczyme Plus 2X*K*H*N*FG -		Alert	20.000	20.000	0	60.000	16.05.20	3,00			112
gluzyme Evly 3.5 L*K*H - B		Alert	20.000	20.000	0	10.556	0	08.03.20	3,00		126
gluzyme 2.5 L*K*H - BULK K		Create	7.100	7.100	0	7.120	0	15.05.20	3,00		112
gluzyme 3.5 L*K*H - BULK K		Create	75.000	75.000	0	20.000	08.05.20	3,00			112
iczyme Yalt*K*H*FG - BULK		Create	50.000	50.000	0	50.000	15.05.20	3,00			112
gluzyme Supra 2.2X*K*H*N		Create	50.000	50.000	0	50.300	09.05.20	3,00			112
gluzym 37071*K*H*N*FG -		Create	20.000	20.000	0	0	19.05.20	3,00			112
cabase 2.5 L*K*H*DS - BULK		OK	0	65.000	0	2.449	0	10.05.20	3,00		112
gluzyme 3.2X*K*H*FG - B		OK	0	13.800	0	0	18.03.20	3,00			112
tearzyme Plus 2X*K*H*N*FG		OK	0	20.000	0	20.000	16.05.20	3,00			112
gluzyme Supra 2.8X*K*H*N		OK	0	16.000	0	0	09.05.20	3,00			112
emval Evly 10 L*H*UL - BULK		OK	0	75.000	0	38.000	14.05.20	3,00			126
tearzyme 2.0 T*K - BULK KG -		OK	0	75.000	0	0	15.05.20	3,00			112
cabase Ultra 2.5 L*K*H - BUL		OK	0	20.000	0	0	10.05.20	3,00			112

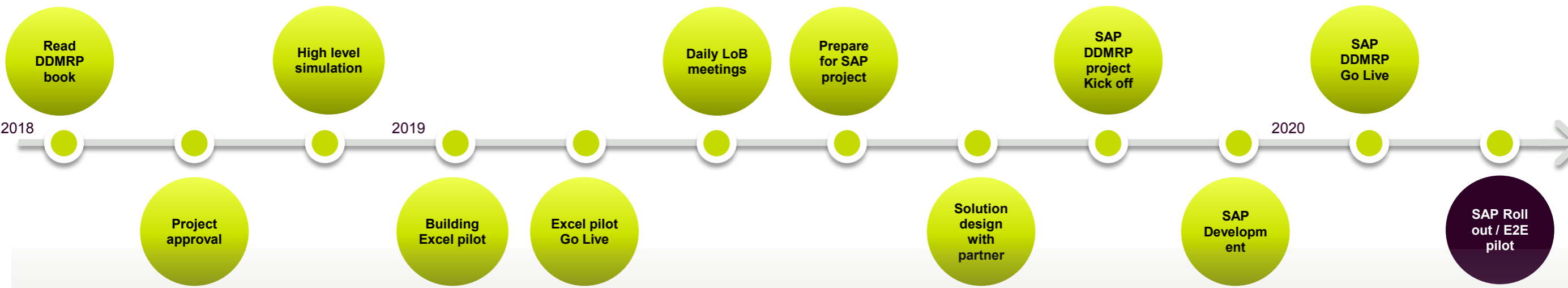




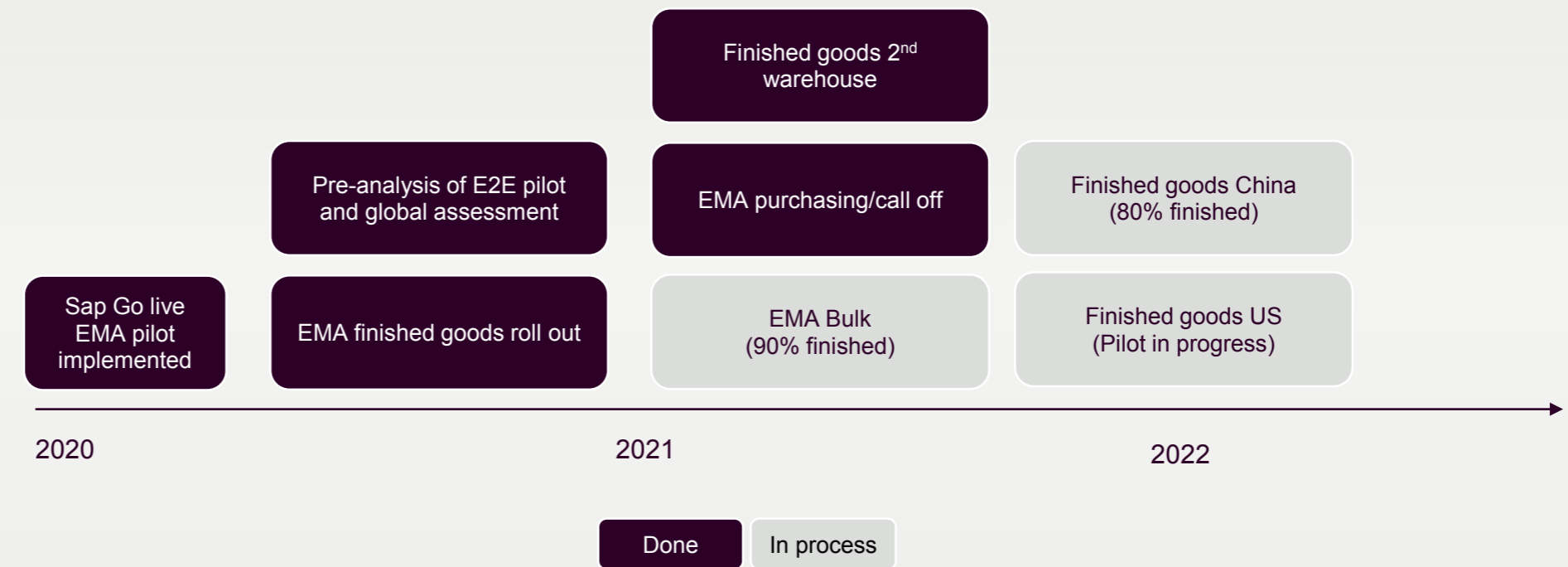
# Positive feedback

- SAP Go live in week 6 with 71 FPP Liquid products And 17 Standardizations
- Successful go live and very positive user feedback
- Hypercare period was shorten due to no issues
- A great cross functional team effort
- Hugh interest from other companies on the concept





# Roll out



## Learnings

### Learnings from Pilot



- ✓ Good fit for NZ for doing DDMRP E2E
- ✓ For 2nd warehouse, finished product and purchasing a good fit for a simple solution
- ✓ Project are 20% IT and 80% change management. Acknowledge that new scheduling and planning processes takes times
- ✓ Take time to convince that DDMRP makes a provides benefit – but when people fully understand concept you have great change agents.

## Success

Hej alle, hørte at 1.del af DDMRP "lukkede" i sidste uge

**Jeg vil bare sige tak for et super godt samarbejde, det har været fedt at arbejde sammen med jer og en pænt vild rejse 😊**

Vi er nået rigtig langt, der er også gået et par år siden vi i Q4-18 startede op. Vi har nu 198 standardiseringer ud af i alt ca. 290

- 169 kører direkte i Sch.Cellen
- 29 styres i "H" af Planneren

Største fordele på Liquid:

- Mindre lager (klart bedre sammensat)
- Bedre leveringsevne
- Systematisk fokus hver dag
- Tappesplits-optimering

- ✓ simplified planning & scheduling process (all in-one screen)
- ✓ a new DDMRP operating model has be established
- ✓ a full integrated solution in SAP APO
- ✓ a super interesting pioneer project as NZ is first company in DK
- ✓ a good example of future project execution by going through: Theory -> POC -> Prototype in excel -> Integrated SAP solution
- ✓ Reduced inventory while improving product availability



# Agenda

- What is Demand Driven MRP
- Novozymes DDMRP transformation
- **Q & A**

BRIDGING BUSINESS AND IT



Thank you

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