



IV CONGRESO PALMERO CPAL 2023

SANTO DOMINGO DEL CERRO

LA ANTIGUA GUATEMALA - 2023





Technologies available for Palm Oil Clarification

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- Introducing Alfa Laval Oil Plus technology
- Why to use
- Where to install
- Upsides and Downsides
- Test results
- Closing and Q&A

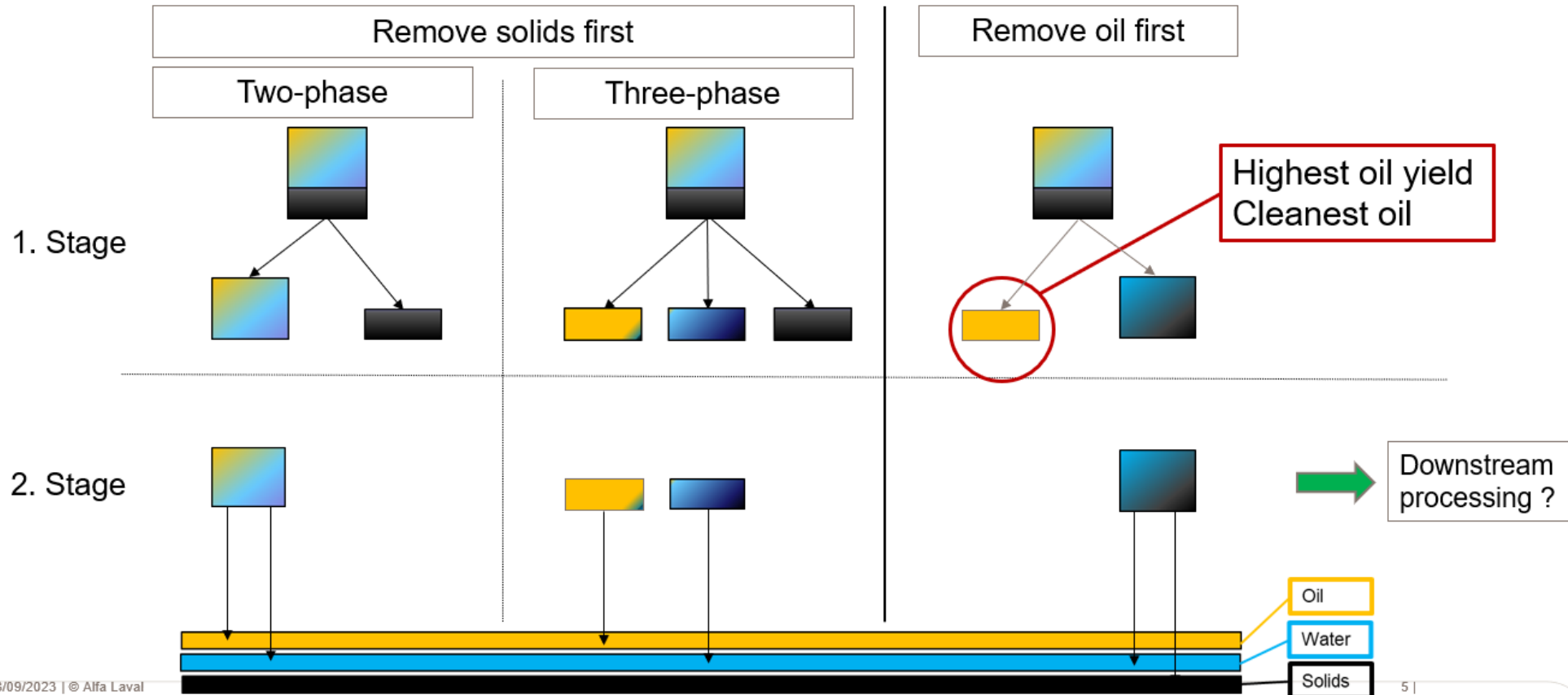


- Oil Plus decanters have been developed to recover **oil and fat from oily feed and can be used in several applications. Patent pending technology**
- Oil Plus works like a **fat/oil skimmer**. Oil or fat is discharged from large end hub and solids and water together are discharged as a second phase in the conical end **as wet cake**
- **Up to 100% of free oil extraction and up to 99,5% of oil/fat purity**
- **Up to 10% extra oil extraction if used in combination with second or separator decanter in series**

Extracting value
to the last drop



**(10) International Publication Number
WO 2020/109135 A1**



Position



- Upstream existing decanter (underflow)
- Downstream existing decanter (Heavy phase)
- Processing condensate and FFB's liquor
- Underflow oil recovery from Static clarification.
- Converting Static to Dynamic clarification while maintaining biomass

Target



- Increase CPO oil extraction by reducing oil losses
- Recover more oil from POME creating new value for valuable biofuels
- Solids are not removed – for maximum biogas production

UPSTREAM - UNDERFLOW

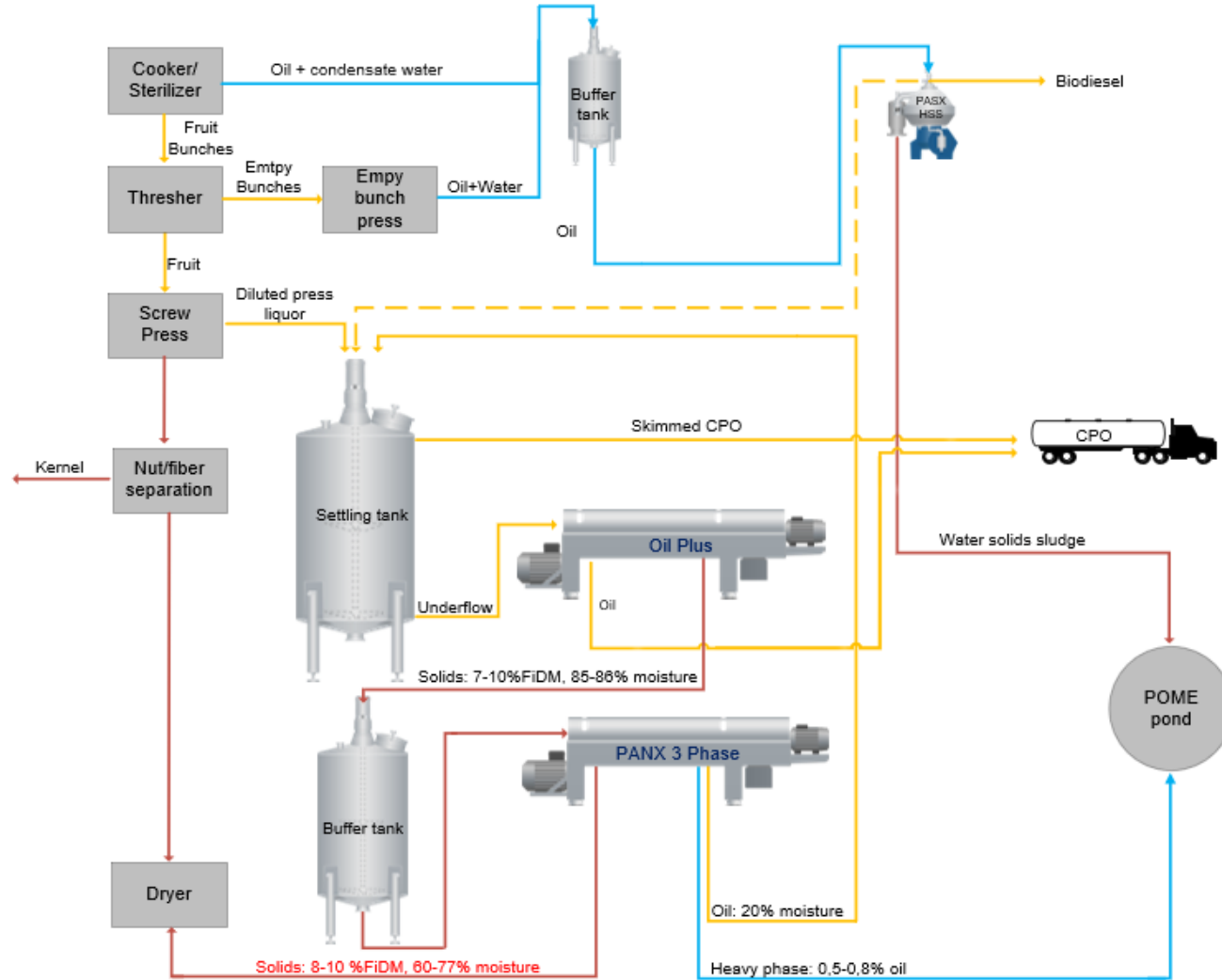
Upsides

- Maximum increase of CPO extraction
- Clean Oil
- Simple operation
- Minimum supervision
- Less wear end tear
- Fast payback, Applicable to any feed

Downsides

- Additional settling tank
- More equipment and installation related cost
Less oil to POME pond





Test results

- Average oil content in the feed 6%
- Oil losses reduced up to 50% in Heavy phase
- Estimated up to + 500 K€ per year in oil recovery, payback in 6 months on a 45 m³/h mill

PANX 600 3 Phase heavy phase				
	Oil	Mois	NOS	OLDB
With Oil Plus	0,33	91,3	8,37	3,8
Without Oil Plus	0,66	90,8	8,54	7,2
PANX 600 3 Phase heavy cake				
	Oil	Mois	NOS	OLDB
With Oil Plus	3,03	74,4	22,57	11,8
Without Oil Plus	2,59	78,2	19,21	11,9

DOWNSTREAM – HEAVY PHASE

Upsides



- Extra POME recovery
- Good oil recovery
- Simple installation
- Simple operation
- Minimum supervision
- Low maintenance costs, lower wear and tear

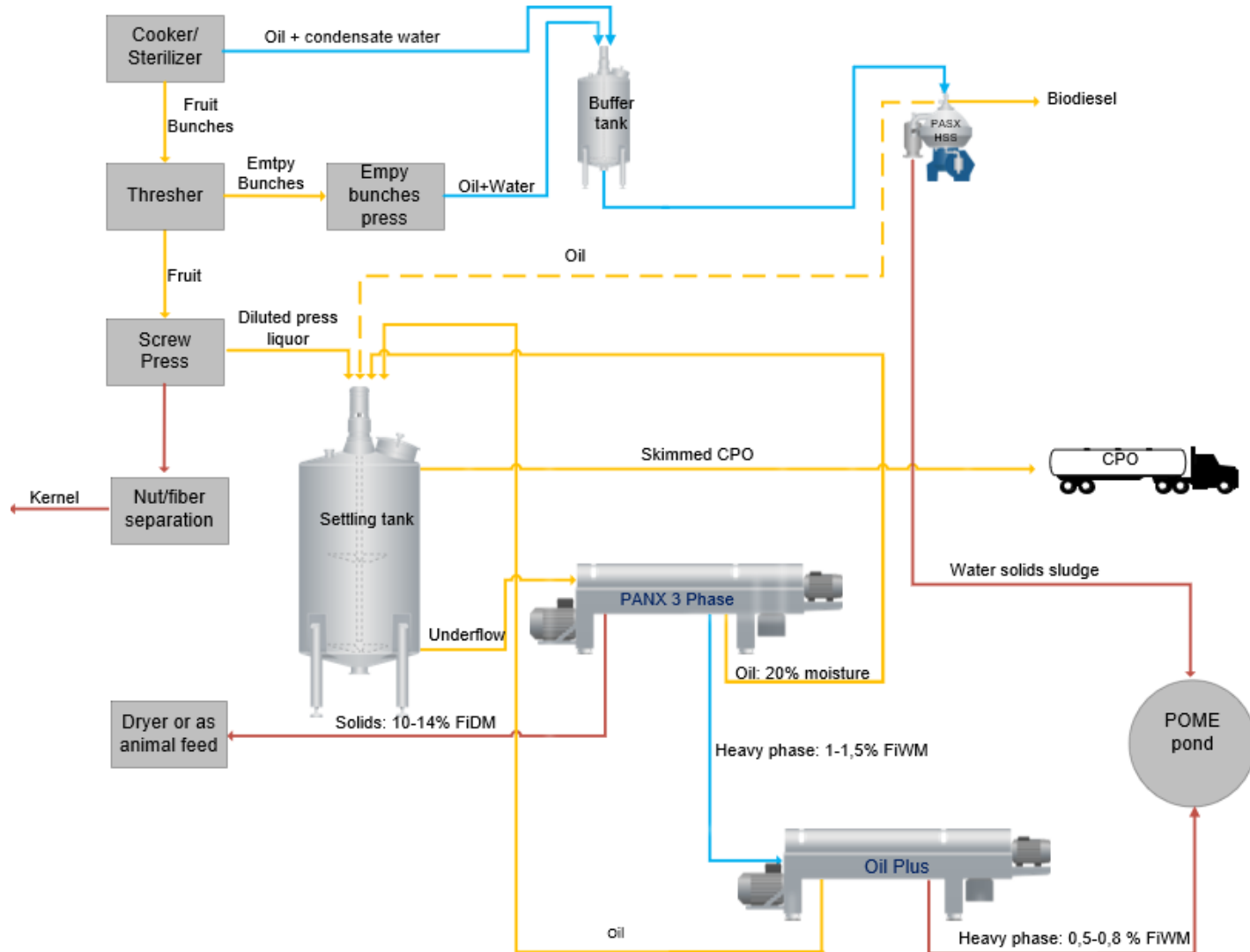
Downsides



- Less revenue if compared with upstream position
- Longer payback
- Less clean oil
- Economically viable from 40 m³/h feed up

Up to + 250 K€ per year in oil recovery, payback in 6 months on a 45 t/h mill





Test results

- Oil Plus have better oil loss performance for both wet and dry basis compared with ordinary 3 phase decanter
- Heavy phase oil losses from 3 phase decanter below 1%
- Estimated up to + 250 K€ per year in oil recovery, payback in 6 months on a 45 t/h mill

Capacity m3/hr	Time	Decanter Feed (Lotus Lab)				Decanter Heavy Phase (Lotus Lab)			
		Oil	Mois	NOS	OLDB	Oil	Mois	NOS	OLDB
12	1520 hr								
12	1430 hr	0.98	91.4	7.6	11.4	0.78	90.9	8.3	8.6
12	1530 hr	0.93	91.2	7.9	10.6	0.78	91.8	7.4	9.5
12	1630 hr								
12	Composite								
12	Composite								
12	Composite	0.88	91.6	7.5	10.5	0.83	91.6	7.6	9.9
12	Composite	0.86	91.5	7.6	10.1	0.76	91.2	8.0	8.6
12	Composite	1.45	92.0	6.6	18.1	0.74	91.4	7.9	8.6
		1.02				0.78			

CONDENSATE WATER AND EFB LIQUOR

Upsides



- Increased POME Oil recovery
- No plant modifications simple installation
- Simple and continuous operation

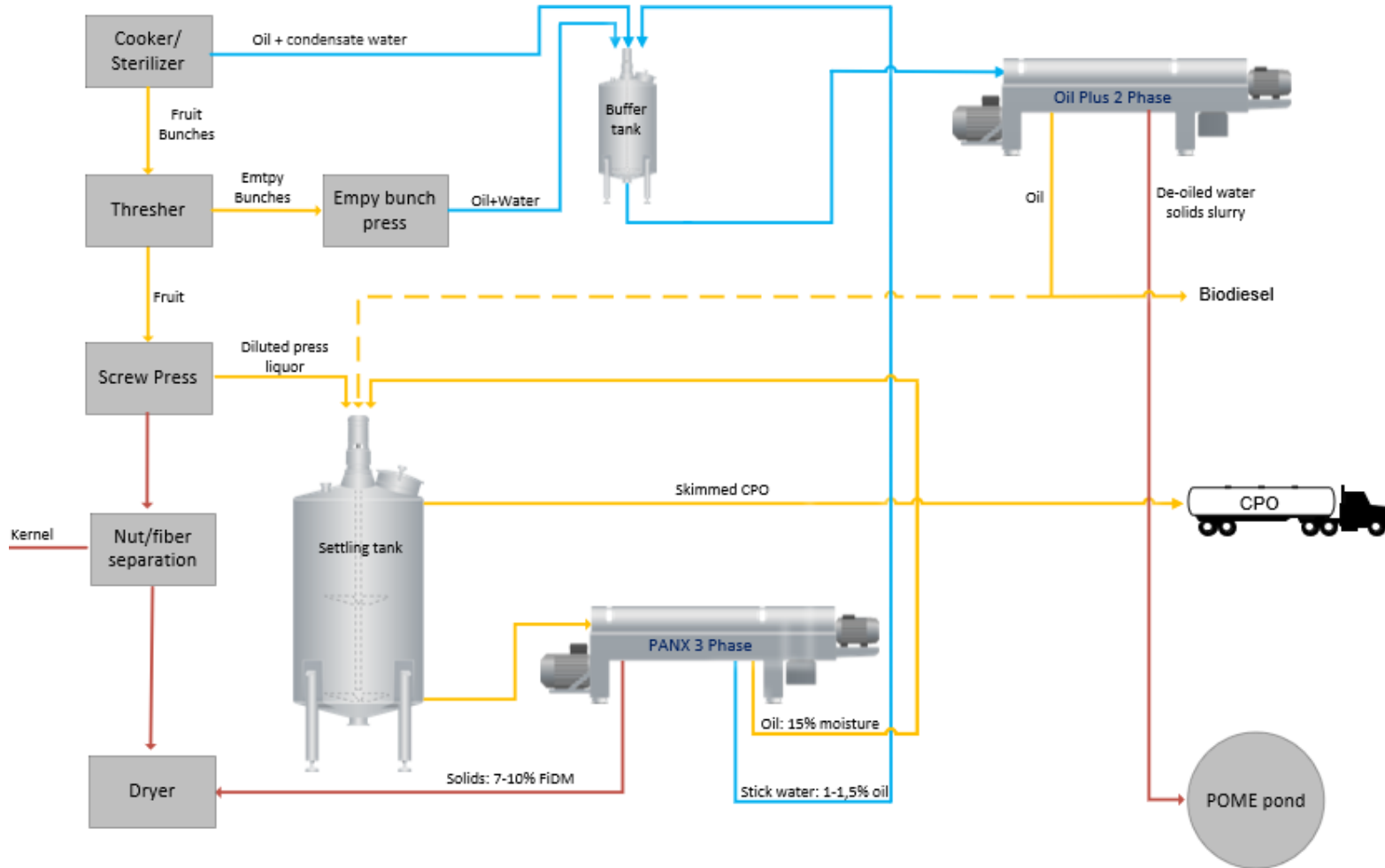
Downsides



- Not existing!

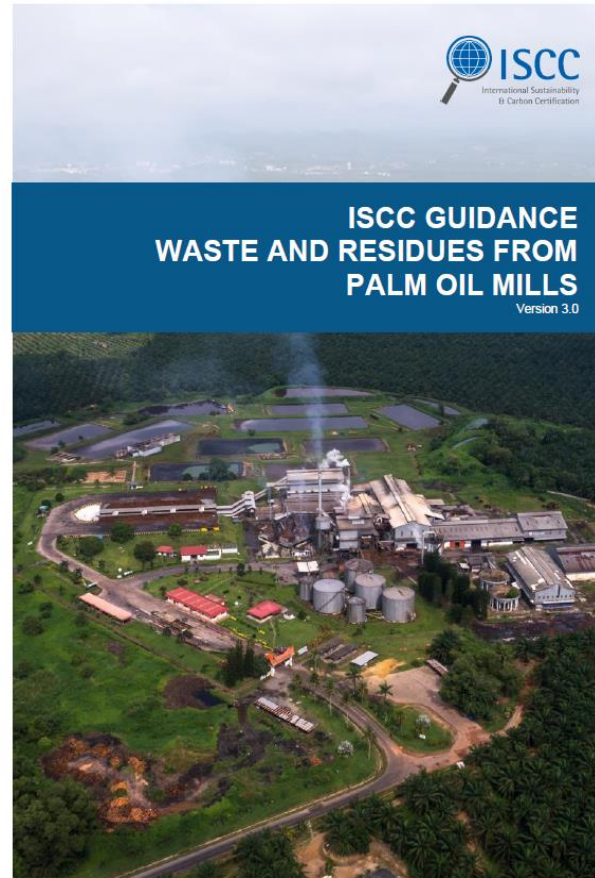
Up to 30% of oil in IWW recovered





POME

- Heavy phase from Decanter
- Sterilizer condensate
- EFB liquor



**DIRECTIVE (EU) 2018/2001
OF THE EUROPEAN
PARLIAMENT AND OF THE
COUNCIL (2018 Dec) and
ISCC GUIDANCE WASTE
AND RESIDUES FROM
PALM OIL MILLS version
3.0 (2022 April)**

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Conclusions

- Maximize CPO extraction
- Increase POME oil recovery for advanced biofuel production







CALIFICA A NUESTRO CONFERENCISTA



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